6th, 7th & 8th GRADE
MATH CURRICULUM

Middle Township Public Schools

216 S. Main Street

Cape May Court House, NJ 08210

Born: April 2024

Unit Overview
Content Area: Mathematics
Unit Title: Unit 1 - The Number System
Grade Level: 6   **Pacing:** 34 - 38 days
Unit Summary: Student focus for this unit is on completing understanding of division of fractions and extending the notion of a number to the system of rational numbers, which includes negative numbers. Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve real-world problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
1-1	6.NS.B.3 MP.5, MP.6, MP.7	add, subtract, and multiply decimals.
1-2	6.NS.B.2, 6.NS.B.3 MP.2, MP.3, MP.6, MP.7	divide whole numbers and decimals.
1-3	Prep for 6.NS.A.1 MP.2, MP.3, MP.4, MP.6	use models and equations to multiply fractions and mixed numbers.

1-4	6.NS.A.1 MP.2, MP.4, MP.7	use models and equations to represent fraction division.
1-5	6.NS.A.1 MP.4, MP.7	divide a fraction by another fraction.
1-6	6.NS.A.1 MP.1, MP.2, MP.7, MP.8	divide with mixed numbers.
1-7	6.NS.A.1 MP.2, MP.3, MP.6	solve multiplication problems with fractions and decimals.
2-1	6.NS.C.5, 6.NS.C.6a, 6.NS.C.6c MP.2, MP.3, MP.7, MP.8	use positive and negative integers.
2-2	6.NS.C.6c, 6.NS.C.7a, 6.NS.C.7b MP.2, MP.3, MP.7, MP.8	represent raitonal numbers using a number line.
2-3	6.NS.C.7c, 6.NS.C.7d MP.2, MP.3, MP.7	find and interpret absolute value.
2-4	6.NS.C.6b, 6.NS.C.6c MP.1, MP.4, MP.6, MP.7, MP.8	graph points with rational coordinates on a coordinate plane.
2-5	6.NS.C.8 MP.2, MP.7	use absolute value to find distance on a coordinate plane.

2-6	6.NS.C.8, 6.G.A.3 MP.2, MP.3, MP.7, MP.8	find the side length of polygons on a coordinate plane.

Assessments	
Formative	- Topic Readiness Assessments - SCOUT Observation Assessments - Guided Practice - Practice & Problem Solving Exit Tickets - Lesson Quick Check Quizzes - Mid-Topic Assessments - Progress Monitoring Assessments
Summative	- End of Topic Assessments - Topic Performance Tasks - Topic STEM Project
Benchmark	- Cumulative Assessments - Common Core Standards Practice Tests
Alternative	Renaissance Star Assessments

Resources & Materials

- 6th grade enVision Mathematics Common Core Volume 1
  - Formative and Summative Assessments are found here
- Savvas Realize online resources
  - Interactive student edition
  - Visual learning
  - Activities and Examples
  - Videos
  - Practice
  - Tutorials – Virtual Nerd
  - Math tools
  - Games
  - Assessment
  - Glossary – read and listen to English/Spanish definitions
- Khan Academy

● MathXL

Interdisciplinary Connections
● W.AW.6.1. Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence. ● MS-PS1-4 Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

Integration of Technology
● 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem. ● 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Career Education- NJSLS 9
● 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 2 – Expressions and Equations
Grade Level: 6 **Pacing:** 42 - 46 days
Unit Summary: Student focus for this unit is on writing, interpreting, and using expressions and equations. Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use

expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as $3x = y$) to describe relationships between quantities.

	Instruction	
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
3-1	6.EE.A.1 MP.2, MP.3, MP.7, MP.8	write and evaluate numbers with exponents.
3-2	6.EE.A.1 MP.2, MP.3, MP.7, MP.8	write the prime factorization and find the greatest common factor and the least common multiple of two numbers.
3-3	6.EE.A.1, 6.EE.A.3 MP.1, MP.3, MP.4, MP.6, MP.7	use the order of operations to evaluate numerical expressions.
3-4	6.EE.A.2a, 6.EE.A.2b, 6.EE.B.6 MP.1, MP.2, MP.4, MP.7	use variable to write algebraic expressions.
3-5	6.EE.A.2c, 6.EE.B.6 MP.3, MP.4, MP.7	evaluate an algebraic expression with whole numbers, decimals, and fractions.
3-6	6.EE.A.3, 6.EE.A.4 MP.1, MP.3, MP.7,	identify and write equivalent algebraic expressions.

	MP.8	
3-7	6.EE.A.3, 6.EE.A.4 MP.1, MP.3, MP.6, MP.7	combine like terms in algebraic expressions.
4-1	6.EE.B.5 MP.2, MP.3, MP.4, MP.7	determine if a value for a variable makes an equations true.
4-2	6.EE.A.4, 6.EE.B.7 MP.2, MP.3, MP.4, MP.7	use the properties of equality to write equivalent equations.
4-3	6.EE.B.7, 6.EE.B.6 MP.2, MP.4, MP.5	write and solve an addition or subtraction equation.
4-4	6.EE.B.7, 6.EE.B.6 MP.1, MP.3, MP.4, MP.8	write and solve a multiplication or division equation.
4-5	6.EE.B.7, 6.EE.B.6 MP.1, MP.3, MP.4, MP.7, MP.8	write and solve equations that involve rational numbers.
4-6	6.EE.B.8, 6.EE.B.5 MP.2, MP.4, MP.6, MP.8	understand and write an inequality that describes a real-world situation.
4-7	6.EE.B.5, 6.EE.B.8 MP.2, MP.4, MP.5, MP.6, MP.8	write and represent solutions of inequalities.
4-8	6.EE.C.9 MP.2, MP.3, MP.4	identify dependent and independent variables.

4-9	6.EE.C.9 MP.1, MP.2, MP.7	use patterns to write and solve equations with variables.
4-10	6.EE.C.9 MP.2, MP.3, MP.4, MP.7	analyze the relationship between dependent and independent variables in tables, graphs, and equations.

Assessments	
Formative	- Topic Readiness Assessments - SCOUT Observation Assessments - Guided Practice - Practice & Problem Solving Exit Tickets - Lesson Quick Check Quizzes - Mid-Topic Assessments - Progress Monitoring Assessments
Summative	- End of Topic Assessments - Topic Performance Tasks - Topic STEM Project
Benchmark	- Cumulative Assessments - Common Core Standards Practice Tests
Alternative	Renaissance Star Assessments

Resources & Materials
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o   Assessment
o   Glossary – read and listen to English/Spanish definitions
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Interdisciplinary Connections

- W.AW.6.1. Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.
- RI.AA.6.7. Trace the development of and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.
- MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

Climate Change Integration

∉   **6.EE.B.7** Solve real-world and mathematical problems by writing and solving equations of the form x+ p=q and px=q for cases in which p, q and x are all nonnegative rational numbers.
  o   **Climate Change Example:** Students may solve real-world problems by writing and solving one-variable equations related to deforestation and/or increasing livestock farming as contributors to climate change.
∉   **6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation to represent the relationship between distance and time.
  o   **Climate Change Example:** Students may analyze and use variables to represent the relationship between greenhouse emissions and livestock farming when representing relationships among contributors to climate change.

Integration of Technology

- 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Career Education- NJSLS 9
● 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 3 – Ratios and Proportional Relationships
Grade Level: 6   **Pacing:** 40 - 44 days
Unit Summary: Student focus for this unit is on connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems. Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.

	Instruction	
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
5-1	6.RP.A.1, 6.RP.A.3 MP.1, MP.2, MP.3, MP.4	use a ratio to describe the relationship between two quantities.
5-2	6.RP.A.3a MP.2, MP.3, MP.5, MP.7, MP.8	use multiplication and division to find equivalent ratios.
5-3	6.RP.A.3a MP.2, MP.4, MP.7	compare ratios to solve problems.
5-4	6.RP.A.3a MP.3, MP.4, MP.7	solve ratio problems by using tables and graphs to show equivalent raitos.
5-5	6.RP.A.2, 6.RP.A.3a, 6.RP.A.3b MP.1, MP.2, MP.3, MP.8	solve problems involving rates.
5-6	6.RP.A.3b, 6.RP.A.3a MP.1, MP.2, MP.6	compare unit rates to solve problems.
5-7	6.RP.A.3b MP.2, MP.4, MP.7, MP.8	use unit rates to solve problems.
5-8	6.RP.A.3d MP.1, MP.2, MP.3,	use ratio reasoning to convert customary measurements.

	MP.4	
5-9	6.RP.A.3d MP.2, MP.3, MP.6, MP.7, MP.8	use unit rates to convert metric measurements.
5-10	6.RP.A.3d MP.1, MP.2, MP.3, MP.8	convert between customary and metric units.
6-1	6.RP.A.3c MP.2, MP.3, MP.4, MP.7	represent and find the percent of a whole.
6-2	6.RP.A.3c MP.2, MP.3, MP.7, MP.8	write equivalent values as fractions, decimals, percents.
6-3	6.RP.A.3c MP.2, MP.3, MP.4, MP.7	write percents that are greater than 100 or less than 1.
6-4	6.RP.A.3c MP.1, MP.2, MP.7	estimate the percent of a number using equivalent fractions, rounding, or compatible numbers.
6-5	6.RP.A.3c MP.1, MP.4, MP.5, MP.6, MP.8	solve problems involving percents.
6-6	6.RP.A.3c MP.1, MP.2, MP.4, MP.6, MP.7	find the whole amount when given a part and the percent.

Assessments	
Formative	● Topic Readiness Assessments ● SCOUT Observation Assessments ● Guided Practice ● Practice & Problem Solving Exit Tickets ● Lesson Quick Check Quizzes ● Mid-Topic Assessments ● Progress Monitoring Assessments
Summative	● End of Topic Assessments ● Topic Performance Tasks ● Topic STEM Project
Benchmark	● Cumulative Assessments ● Common Core Standards Practice Tests
Alternative	● Renaissance Star Assessments

Resources & Materials

• 6th grade enVision Mathematics Common Core Volume 2
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• MathXL

Interdisciplinary Connections
- W.AW.6.1. Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.   - RI.AA.6.7. Trace the development of and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.   - MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

Integration of Technology
9.4.8.TL.3: Select appropriate tools to organize and present information digitally.   9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.

Career Education- NJSLS 9
9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 4 – Geometry, Statistics, and Probability
Grade Level: 6   **Pacing:** 38 – 42 days
Unit Summary: Student focus for this unit is on developing understanding of statistical thinking. Building on and reinforcing their understanding of a number, students begin to develop their ability to think statistically. Students recognize that a data distribution may not have a definite center and that different ways to measure center yield different values (median and mean). Students recognize that a measure of variability (interquartile range or mean absolute deviation) can also be useful for summarizing data because two very different sets of data can have the

same mean and median yet be distinguished by their variability. Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected.

   Students build on their understanding with area, by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
7-1	6.G.A.1, 6.EE.A.2c MP.2, MP.3, MP.6, MP.7, MP.8	use what they know about area of rectangles to find the area of parallelograms and rhombuses.
7-2	6.G.A.1, 6.EE.A.2c MP.2, MP.3, MP.6, MP.7, MP.8	find the area of triangles.
7-3	6.G.A.1, 6.EE.A.2c MP.1, MP.3, MP.6, MP.7	find the area of trapezoids and kites.
7-4	6.G.A.1, 6.EE.A.2c, 6.G.A.3, 6.NS.C.6c, 6.NS.C.8 MP.1, MP.4, MP.6, MP.7	find the areas of polygons.

7-5	6.G.A.4 MP.1, MP.2, MP.3, MP.6, MP.7	represent solid figures using nets.
7-6	6.G.A.4, 6.EE.A.2a, 6.EE.A.2c, 6.EE.B.6 MP.1, MP.3, MP.5, MP.6	draw a net of a prism and use it to find the prism's surface area.
7-7	6.G.A.4, 6.EE.A.2a, 6.EE.A.2c, 6.EE.B.6 MP.2, MP.3, MP.5, MP.7	draw a net of a pyramid and use it to find the pyramid's surface area.
7-8	6.G.A.2, 6.EE.A.2a, 6.EE.A.2c, 6.EE.B.6 MP.1, MP.2, MP.3, MP.6, MP.7	find the volume of a rectangular prism with fractional edge lengths.
8-1	6.SP.A.1, 6.SP.B.4 MP.1, MP.2, MP.4, MP.8	identify and write statistical questions.
8-2	6.SP.A.3, 6.SP.B.5c MP.2, MP.3, MP.7, MP.8	identify the mean, median, mode, and range of a data set.
8-3	6.SP.B.4	make and interpret box plots.
8-4	6.SP.B.4, 6.SP.B.5a MP.2, MP.4, MP.6, MP.7, MP.8	make and analyze frequency tables and histograms.
8-5	6.SP.B.5c, 6.SP.B.4 MP.2, MP.3, MP.4	use measures of variability to describe a data set.

8-6	6.SP.B.5d, 6.SP.B.5c MP.1, MP.2, MP.3, MP.7	select and use appropriate statistical measures.
8-7	6.SP.A.2, 6.SP.B.4, 6.SP.B.5b, 6.SP.B.5c MP.3, MP.4, MP.8	summarize numerical data sets.

Assessments	
Formative	- Topic Readiness Assessments - SCOUT Observation Assessments - Guided Practice - Practice & Problem Solving Exit Tickets - Lesson Quick Check Quizzes - Mid-Topic Assessments - Progress Monitoring Assessments
Summative	- End of Topic Assessments - Topic Performance Tasks - Topic STEM Project
Benchmark	- Cumulative Assessments - Common Core Standards Practice Tests
Alternative	Renaissance Star Assessments

Resources & Materials
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- o   Tutorials – Virtual Nerd
- o   Math tools
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Interdisciplinary Connections
● MS-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

Climate Change Integration
● **6.SP.B.4** Display numerical data in plots on a number line, including dot plots, histograms, and box plots. highlighted as an opportunity for inclusion in an interdisciplinary climate change unit.   o **Climate Change Example**: Students may display numerical data related to deforestation and increasing livestock farming as contributors to climate change in plots on a number line, including dot plots, histograms, and box plots.

Integration of Technology
● 9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.

Career Education- NJSLS 9
● 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.

Accommodations and Modifications for All Units	
Special Education	● Follow 504/IEP accommodations ● Step by step examples

	• Visual demonstration of skill or activity • Allow for flexible grouping • Student centered activities • Learning Stations • Small group & large group discussions • Problem solving situations • Restate, reword, clarify directions • Provide Educational "breaks" as necessary • Utilize visual and audio cues
English Language Learners	• Step by step examples • Visual demonstration of skill or activity • Allow for flexible grouping • Student centered activities • Learning Stations • Small group & large group discussions • Problem solving situations • Utilize visual and audio cues • Highlight, define, or demonstrate important vocabulary • Restate, reword, clarify directions
Students At-Risk of School Failure	• Step by step examples • Visual demonstration of skill or activity • Allow for flexible grouping • Student centered activities • Learning Stations • Small group & large group discussions • Problem solving situations • Utilize visual and audio cues • Highlight, define, or demonstrate important vocabulary • Restate, reword, clarify directions • Chunking content into small segments • Shorten or reduce assignment to focus on one specific skill
Gifted and Talented	• Student Choice • Student centered activities • Enhance skill or activity based on Individual Student Need

	- Allow for flexible grouping - Problem solving situations
Students with 504 Plans	- Follow 504/IEP accommodations - Step by step examples - Visual demonstration of skill or activity - Allow for flexible grouping - Student centered activities - Learning Stations - Small group & large group discussions - Problem solving situations - Restate, reword, clarify directions - Provide Educational "breaks" as necessary - Utilize visual and audio cues

Unit Overview

Content Area: Mathematics

Unit Title: Unit 1 – The Number System

Grade Level: 7   **Pacing:** 24 – 26 days

Unit Summary:

    Students focus on developing understanding of operations with rational numbers in preparation for working with expressions and linear equations. Students develop a unified understanding of numbers, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers.

	Instruction	
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
1-1	7.NS.A.1a MP.1, MP.2, MP.3, MP.4	relate integers, their opposites, and their absolute values.
1-2	7.NS.A.2d MP.1, MP.2, MP.6, MP.7	recognize rational numbers and write them in decimal form.
1-3	7.NS.A.1b, 7.NS.A.1d MP.2, MP.3, MP.4, MP.5, MP.7	add integers.
1-4	7.NS.A.1c, 7.NS.A.1d MP.1, MP.2, MP.3, MP.4, MP.7	subtract integers.
1-5	7.NS.A.1b, 7.NS.A.1c, 7.NS.A.1d MP.2, MP.3, MP.4, MP.7, MP.8	add and subtract rational numbers.
1-6	7.NS.A.2a, 7.NS.A.2c MP.1, MP.2, MP.3, MP.4, MP.6, MP.7, MP.8	multiply integers.
1-7	7.NS.A.2a, 7.NS.A.2c	multiply rational numbers.

1-8	7.NS.A.2b, 7.NS.A.2c MP.2, MP.4, MP.7, MP.8	divide integers.
1-9	7.NS.A.2b, 7.NS.A.2c MP.1, MP.2, MP.3, MP.7, MP.8	divide rational numbers.
1-10	7.NS.A.3, 7.EE.B.3 MP.1, MP.2, MP.3, MP.4, MP.8	solve problems with rational numbers.

The first row continues from the previous page showing: MP.4, MP.6, MP.8

Assessments	
Formative	- Topic Readiness Assessments - SCOUT Observation Assessments - Guided Practice - Practice & Problem Solving Exit Tickets - Lesson Quick Check Quizzes - Mid-Topic Assessments - Progress Monitoring Assessments
Summative	- End of Topic Assessments - Topic Performance Tasks - Topic STEM Project
Benchmark	- Cumulative Assessments - Common Core Standards Practice Tests
Alternative	Renaissance Star Assessments

Resources & Materials
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Interdisciplinary Connections
- 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.

Climate Change Integration
7.NS.B.3 Solve real-world and mathematical problems involving the four operations with rational numbers. (Clarification: Computations with rational numbers extend the rules for manipulating fractions to complex fractions.) highlighted as an opportunity for inclusion in an interdisciplinary climate change unit.   **Climate Change Example**: Students may solve real-world problems involving the four operations with rational numbers related to the relationship between altitude and the temperature above sea level.

Integration of Technology
9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.   9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

Career Education- NJSLS 9
9.2.8.CAP.14: Evaluate sources of income and alternative resources to accurately compare employment options.   9.2.8.CAP.20: Identify the items to consider when estimating the cost of funding a business.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 2 – Proportional Relationships
Grade Level: 7   **Pacing:** 16 – 18 days
Unit Summary: Students focus on developing understanding of and applying proportional relationships to real-world problems. Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
2-1	7.RP.A.1, 7.RP.A.3 MP.1, MP.3, MP.6, MP.7, MP.8	use ratio concepts and reasoning to solve multi-step problems.
2-2	7.RP.A.1, 7.RP.A.3 MP.3, MP.6, MP.7	find unit rates with ratios of fractions and use them to solve problems.
2-3	7.RP.A.2a MP.1, MP.2, MP.3, MP.7, MP.8	test for equivalent ratios to decide whether quantities are in a proportional relationship.
2-4	7.RP.A.2b, 7.RP.A.2c MP.2, MP.3, MP.4, MP.6, MP.8	use the constant of proportionality in an equation to represent a proportional relationship.
2-5	7.RP.A.2a, 7.RP.A.2b, 7.RP.A.2d MP.2, MP.3, MP.4, MP.7	use a graph to determine whether two quantities are proportional.
2-6	7.RP.A.2, 7.RP.A.3 MP.1, MP.2, MP.5, MP.7	determine whether a relationship is proportional and use representations to solve problems.

Assessments	
Formative	● Topic Readiness Assessments ● SCOUT Observation Assessments ● Guided Practice ● Practice & Problem Solving Exit Tickets

	• Lesson Quick Check Quizzes • Mid-Topic Assessments • Progress Monitoring Assessments
Summative	• End of Topic Assessments • Topic Performance Tasks • Topic STEM Project
Benchmark	• Cumulative Assessments • Common Core Standards Practice Tests
Alternative	• Renaissance Star Assessments

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  - Activities and Examples
  - Videos
  - Practice
  - Tutorials – Virtual Nerd
  - Math tools
  - Games
  - Assessment
  - Glossary – read and listen to English/Spanish definitions
- Khan Academy
- MathXL

Interdisciplinary Connections

- MS-PS3-1 Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
- MS-PS3-5 Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.
- MS-PS4-1 Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.

Integration of Technology
● 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.

Career Education- NJSLS 9
● 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 3 – Expressions and Equations
Grade Level: 7 **Pacing:** 38 – 42 days
Unit Summary: Students focus on developing how to write, simplify, and evaluate expressions, linear equations, and inequalities. Students use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems. Students will use properties of operations to generate equivalent expressions. Students explore and solve real-life mathematical problems using numerical and algebraic expressions and equations. The unit includes a variety of tasks that allow students to explore the ways to solve equations and inequalities, while also applying these skills to real-world contexts.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
4-1	7.EE.B.3, 7.EE.B.4 MP.2, MP.4, MP.6,	write and evaluate algebraic expressions.

	MP.7	
4-2	7.EE.A.1 MP.1, MP.2, MP.3	write equivalent expressions for given expressions.
4-3	7.EE.A.1 MP.1, MP.2, MP.3, MP.7	use properties of operations to simplify expressions.
4-4	7.EE.A.1, 7.EE.A.2 MP.1, MP.4, MP.7	expand expressions using the Distributive Property.
4-5	7.EE.A.1, 7.EE.A.2 MP.1, MP.2, MP.3, MP.8	use common factors and the Distributive Property to factor expressions.
4-6	7.EE.A.1, 7.EE.A.2 MP.1, MP.2, MP.4, MP.6, MP.7	add expressions that represent real-world problems.
4-7	7.EE.A.1, 7.EE.A.2 MP.1, MP.3, MP.4, MP.7	subtract expressions using properties of operations.
4-8	7.EE.A.2 MP.2, MP.7	use an equivalent expression to find new information.
5-1	7.EE.B.4 MP.2, MP.4, MP.7	represent a problem with a two-step equation.
5-2	7.EE.B.3, 7.EE.B.4a MP.1, MP.7	solve a problem with a two-step equation.
5-3	7.EE.B.3, 7.EE.B.4a	use the Distributive Property to solve equations.

	MP.1, MP.2, MP.3, MP.4, MP.7	
5-4	7.EE.B.4b MP.2, MP.4	solve inequalities using addition or subtraction.
5-5	7.EE.B.4b MP.2, MP.3, MP.6, MP.7	solve inequalities using multiplication or division.
5-6	7.EE.B.4b MP.1, MP.2, MP.4, MP.7	write and solve two-step inequalities.
5-7	7.EE.B.4b MP.2, MP.3, MP.4, MP.7	solve inequalities that require multiple steps.

Assessments	
Formative	- Topic Readiness Assessments - SCOUT Observation Assessments - Guided Practice - Practice & Problem Solving Exit Tickets - Lesson Quick Check Quizzes - Mid-Topic Assessments - Progress Monitoring Assessments
Summative	- End of Topic Assessments - Topic Performance Tasks - Topic STEM Project
Benchmark	- Cumulative Assessments - Common Core Standards Practice Tests
Alternative	Renaissance Star Assessments

Resources & Materials

- 7th grade enVision Mathematics Common Core Volume 1 and Volume 2
  - Formative and Summative Assessments are found here
- Savvas Realize online resources
  - Interactive student edition
  - Visual learning
  - Activities and Examples
  - Videos
  - Practice
  - Tutorials – Virtual Nerd
  - Math tools
  - Games
  - Assessment
  - Glossary – read and listen to English/Spanish definitions
- Khan Academy
- MathXL

Interdisciplinary Connections

- MS-ESS1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
- MS-ESS1-4 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.

Climate Change Integration

∉ **7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. **For example:** If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation. highlighted as an opportunity for inclusion in an interdisciplinary climate change unit.
  - **Climate Change Example:** Students may solve multi-step real-life problems posed with positive and negative rational numbers in any form related to the

relationship between altitude and the temperature above sea level.

Integration of Technology
● 9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

Career Education- NJSLS 9
● 9.2.8.CAP.20: Identify the items to consider when estimating the cost of funding a business.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 4 – Connect Proportional Relationships and Equations to Percent Problems
Grade Level: 7   **Pacing:** 16 – 18 days
Unit Summary: Students focus on developing an understanding of and applying proportional relationships to percent problems. Students extend their understanding of proportional relationships and writing and solving equations to develop percent equations. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
3-1	7.RP.A.3 MP.1, MP.2, MP.3,	understand, find, and analyze percents of numbers.

	MP.7	
3-2	7.RP.A.2c, 7.RP.A.3 MP.1, MP.2, MP.3, MP.7	use proportions to solve percent problems.
3-3	7.RP.A.2c, 7.RP.A.3 MP.1, MP.2, MP.3, MP.4, MP.6, MP.7	represent and solve percent problems using equations.
3-4	7.RP.A.3 MP.1, MP.3, MP.4, MP.6, MP.7	solve problems involving percent change and percent error.
3-5	7.RP.A.3 MP.1, MP.2, MP.4, MP.8	solve problems involving percent markup and markdown.
3-6	7.RP.A.3 MP.1, MP.2, MP.3	apply percent reasoning to solve simple interest problems.

Assessments	
Formative	● Topic Readiness Assessments ● SCOUT Observation Assessments ● Guided Practice ● Practice & Problem Solving Exit Tickets ● Lesson Quick Check Quizzes ● Mid-Topic Assessments ● Progress Monitoring Assessments
Summative	● End of Topic Assessments ● Topic Performance Tasks ● Topic STEM Project
Benchmark	● Cumulative Assessments ● Common Core Standards Practice Tests

Alternative	● Renaissance Star Assessments

Resources & Materials

- 7th grade enVision Mathematics Common Core Volume 1
  - Formative and Summative Assessments are found here
- Savvas Realize online resources
  - Interactive student edition
  - Visual learning
  - Activities and Examples
  - Videos
  - Practice
  - Tutorials – Virtual Nerd
  - Math tools
  - Games
  - Assessment
  - Glossary – read and listen to English/Spanish definitions
- Khan Academy
- MathXL

Interdisciplinary Connections

- MS-ESS1-1 Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
- 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.

Integration of Technology

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

Career Education- NJSLS 9
● 9.2.8.CAP.14: Evaluate sources of income and alternative resources to accurately compare employment options.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 5 – Statistics and Probability
Grade Level: 7   **Pacing:** 20 – 24 days
Unit Summary: Students focus on drawing inferences about populations based on samples. Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences. Students investigate chance processes and develop, use and evaluate probability models.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
6-1	7.SP.A.1 MP.1, MP.2, MP.3, MP.6, MP.8	determine if a sample is representative of a population.
6-2	7.SP.A.1, 7.SP.A.2, 7.RP.A.2c MP.1, MP.2, MP.3, MP.4	make inferences about a population from a sample data set.

7-1	7.SP.C.5, 7.EE.B.3 MP.1, MP.2, MP.3, MP.4	describe the likelihood that an event will occur.
7-2	7.SP.C.6, 7.RP.A.2c MP.1, MP.2, MP.3, MP.4, MP.7	determine the theoretical probability of an event.
7-3	7.SP.C.6, 7.SP.C.7 MP.2, MP.3, MP.7	determine the experimental probability of an event.
7-4	7.SP.C.7a, 7.SP.C.7b, 7.EE.B.3 MP.2, MP.3, MP.4, MP.6, MP.7	use probability models to find probabilities of events.
7-5	7.SP.C.8b MP.1, MP.2, MP.7, MP.8	find all possible outcomes of a compound event.
7-6	7.SP.C.8a MP.1, MP.4, MP.7, MP.8	find the probability of a compound event.
7-7	7.SP.C.8c MP.1, MP.3, MP.4, MP.5, MP.7	simulate a compound event to approximate its probability.

Assessments	
Formative	● Topic Readiness Assessments ● SCOUT Observation Assessments ● Guided Practice ● Practice & Problem Solving Exit Tickets ● Lesson Quick Check Quizzes ● Mid-Topic Assessments

	● Progress Monitoring Assessments
Summative	● End of Topic Assessments ● Topic Performance Tasks ● Topic STEM Project
Benchmark	● Cumulative Assessments ● Common Core Standards Practice Tests
Alternative	● Renaissance Star Assessments

Resources & Materials

- 7th grade enVision Mathematics Common Core Volume 2
  - Formative and Summative Assessments are found here
- Savvas Realize online resources
  - Interactive student edition
  - Visual learning
  - Activities and Examples
  - Videos
  - Practice
  - Tutorials – Virtual Nerd
  - Math tools
  - Games
  - Assessment
  - Glossary – read and listen to English/Spanish definitions
- Khan Academy
- MathXL

Interdisciplinary Connections

- MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- MS-ETS1-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Integration of Technology
9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.   9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping.

Career Education- NJSLS 9
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.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 6 – Geometry
Grade Level: 7 **Pacing:** 22 – 24 days
Unit Summary: Students focus on solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume. Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
8-1	7.G.A.1 MP.2, MP.7, MP.8	use the key in a scale drawing to find missing measures.
8-2	7.G.A.2, MP.1, MP.2, MP.3, MP.5	draw figures with given conditions.
8-3	7.G.A.2 MP.1, MP.7, MP.8	draw triangles when given information about their side lengths and angle measures.
8-4	7.G.B.5 MP.2, MP.3, MP.7	solve problems involving angle relationships.
8-5	7.G.B.4, 7.EE.B.4a MP.1, MP.6, MP.6, MP.7, MP.8	solve problems involving radius, diameter, and circumference of circles.
8-6	7.G.B.4, 7.EE.B.4a, 7.EE.B.3 MP.2, MP.6, MP.7	solve problems involving area of a circle.
8-7	7.G.A.3 MP.1, MP.6, MP.7, MP.8	determine what the cross section looks like when a 3D figure is sliced.
8-8	7.G.B.6, 7.NS.A.3, 7.EE.B.3, 7.EE.B.4a MP.1, MP.2, MP.7	find the area and surface area of 2-dimensional composite shapes and 3-dimensional prisms.
8-9	7.G.B.6, 7.NS.A.3, 7.EE.B.3, 7.EE.B.4a	use the area of the base of a three-dimensional figure to find its volume.

	MP.1, MP.2, MP.4, MP.7	

Assessments	
Formative	• Topic Readiness Assessments • SCOUT Observation Assessments • Guided Practice • Practice & Problem Solving Exit Tickets • Lesson Quick Check Quizzes • Mid-Topic Assessments • Progress Monitoring Assessments
Summative	• End of Topic Assessments • Topic Performance Tasks • Topic STEM Project
Benchmark	• Cumulative Assessments • Common Core Standards Practice Tests
Alternative	• Renaissance Star Assessments

Resources & Materials
• 7th grade enVision Mathematics Common Core Volume 2 o Formative and Summative Assessments are found here • Savvas Realize online resources o Interactive student edition o Visual learning o Activities and Examples o Videos o Practice o Tutorials – Virtual Nerd o Math tools o Games o Assessment o Glossary – read and listen to English/Spanish definitions • Khan Academy • MathXL

Interdisciplinary Connections
• MS-LS1-1 Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

Climate Change Integration
• **7.G.B.6** Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. highlighted as an opportunity for inclusion in an interdisciplinary climate change unit.   ○ **Climate Change Example**: Students may solve real-world problems involving area, surface area, and volume related to deforestation and increasing livestock farming as key contributors to climate change.

Integration of Technology
• 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.

Career Education- NJSLS 9
• 9.2.12.CAP.6: Identify transferable skills in career choices and design alternative career plans based on those skills.

Accommodations and Modifications for All Units	
Special Education	• Follow 504/IEP accommodations • Step by step examples • Visual demonstration of skill or activity • Allow for flexible grouping • Student centered activities • Learning Stations • Small group & large group discussions • Problem solving situations • Restate, reword, clarify directions

	● Provide Educational "breaks" as necessary ● Utilize visual and audio cues
English Language Learners	● Step by step examples ● Visual demonstration of skill or activity ● Allow for flexible grouping ● Student centered activities ● Learning Stations ● Small group & large group discussions ● Problem solving situations ● Utilize visual and audio cues ● Highlight, define, or demonstrate important vocabulary ● Restate, reword, clarify directions
Students At-Risk of School Failure	● Step by step examples ● Visual demonstration of skill or activity ● Allow for flexible grouping ● Student centered activities ● Learning Stations ● Small group & large group discussions ● Problem solving situations ● Utilize visual and audio cues ● Highlight, define, or demonstrate important vocabulary ● Restate, reword, clarify directions ● Chunking content into small segments ● Shorten or reduce assignment to focus on one specific skill
Gifted and Talented	● Student Choice ● Student centered activities ● Enhance skill or activity based on Individual Student Need ● Allow for flexible grouping ● Problem solving situations
Students with 504 Plans	● Follow 504/IEP accommodations ● Step by step examples ● Visual demonstration of skill or activity ● Allow for flexible grouping ● Student centered activities ● Learning Stations ● Small group & large group discussions ● Problem solving situations ● Restate, reword, clarify directions ● Provide Educational "breaks" as necessary ● Utilize visual and audio cues

Unit Overview

Content Area: Mathematics

Unit Title: Unit 1 – The Number System

Grade Level: Advanced 7   **Pacing:** 18 – 32 days

Unit Summary:

   Students focus on developing understanding of operations with rational numbers in preparation for working with expressions and linear equations. Students develop a unified understanding of numbers, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. Students develop an understanding of numbers that are not rational, and approximate them by rational numbers. They will work with radicals and integer exponents.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
1-1	7.NS.A.1a MP.1, MP.2, MP.3, MP.4	relate integers, their opposites, and their absolute values.
1-2	7.NS.A.2d MP.1, MP.2, MP.6, MP.7	recognize rational numbers and write them in decimal form.
1-3	7.NS.A.1b, 7.NS.A.1d MP.2, MP.3, MP.4,	add integers.

	MP.5, MP.7	
1-4	7.NS.A.1c, 7.NS.A.1d MP.1, MP.2, MP.3, MP.4, MP.7	subtract integers.
1-5	7.NS.A.1b, 7.NS.A.1c, 7.NS.A.1d MP.2, MP.3, MP.4, MP.7, MP.8	add and subtract rational numbers.
1-6	7.NS.A.2a, 7.NS.A.2c MP.1, MP.2, MP.3, MP.4, MP.6, MP.7, MP.8	multiply integers.
1-7	7.NS.A.2a, 7.NS.A.2c MP.4, MP.6, MP.8	multiply rational numbers.
1-8	7.NS.A.2b, 7.NS.A.2c MP.2, MP.4, MP.7, MP.8	divide integers.
1-9	7.NS.A.2b, 7.NS.A.2c MP.1, MP.2, MP.3, MP.7, MP.8	divide rational numbers.
1-10	7.NS.A.3, 7.EE.B.3 MP.1, MP.2, MP.3, MP.4, MP.8	solve problems with rational numbers.
2-1	8.NS.A.1	write repeating decimals as fractions.

	MP.2, MP.6, MP.7	
2-2	8.NS.A.1, 8.NS.A.3 MP.1, MP.2, MP.3, MP.7, MP.8	classify a number as rational or irrational and determine whether sum, difference, product, or quotient of two real numbers represents a rational number or an irrational number.
2-3	8.NS.A.2 MP.1, MP.2, MP.3, MP.4, MP.7	compare and order rational and irrational numbers.
2-4	8.EE.A.2.a, 8.EE.A.2b MP.2, MP.3, MP.7, MP.8	evaluate square roots of small perfect squares and cube roots of small perfect cubes and simplify square roots of non-perfect squares.
2-5	8.EE.A.2 MP.2, MP.3, MP.6, MP.7, MP.8	solve equations involving squares or cubes.
2-6	8.EE.A.1 MP.3, MP.4, MP.7	use the properties of exponents to write equivalent expressions.
2-7	8.EE.A.1 MP.2, MP.3, MP.6	write a number with a negative or zero exponent a different way.
2-8	8.EE.A.3 MP.3, MP.6, MP.7	estimate large and small quantities using a power of 10.
2-9	8.EE.A.4 MP.3, MP.5, MP.7	use scientific notation to write very large or very small quantities.
2-10	8.EE.A.4 MP.3, MP.6, MP.7	perform operations with numbers in scientific notation.

Assessments	
Formative	- Topic Readiness Assessments - SCOUT Observation Assessments - Guided Practice - Practice & Problem Solving Exit Tickets - Lesson Quick Check Quizzes - Mid-Topic Assessments - Progress Monitoring Assessments
Summative	- End of Topic Assessments - Topic Performance Tasks - Topic STEM Project
Benchmark	- Cumulative Assessments - Common Core Standards Practice Tests
Alternative	Renaissance Star Assessments

Resources & Materials
- Advanced 7th grade enVision Mathematics Common Core Volume 1   - Formative and Summative Assessments are found here   - Savvas Realize online resources   - Interactive student edition   - Visual learning   - Activities and Examples   - Videos   - Practice   - Tutorials – Virtual Nerd   - Math tools   - Games   - Assessment   - Glossary – read and listen to English/Spanish definitions   - Khan Academy   - MathXL

Interdisciplinary Connections
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-PS3-1 Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.

Climate Change Integration
7.NS.B.3 Solve real-world and mathematical problems involving the four operations with rational numbers. (Clarification: Computations with rational numbers extend the rules for manipulating fractions to complex fractions.) highlighted as an opportunity for inclusion in an interdisciplinary climate change unit.   **Climate Change Example**: Students may solve real-world problems involving the four operations with rational numbers related to the relationship between altitude and the temperature above sea level.

Integration of Technology
9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.   9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

Career Education- NJSLS 9
9.2.8.CAP.14: Evaluate sources of income and alternative resources to accurately compare employment options.   9.2.8.CAP.20: Identify the items to consider when estimating the cost of funding a business.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 2 – Proportional Relationships
Grade Level: Advanced 7   **Pacing:** 10 – 12 days

Unit Summary:

Students focus on developing understanding of and applying proportional relationships to real-world problems. Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
3-1	7.RP.A.1, 7.RP.A.3 MP.1, MP.3, MP.6, MP.7, MP.8	use ratio concepts and reasoning to solve multi-step problems.
3-2	7.RP.A.1, 7.RP.A.3 MP.3, MP.6, MP.7	find unit rates with ratios of fractions and use them to solve problems.
3-3	7.RP.A.2a MP.1, MP.2, MP.3, MP.7, MP.8	test for equivalent ratios to decide whether quantities are in a proportional relationship.
3-4	7.RP.A.2b, 7.RP.A.2c MP.2, MP.3, MP.4, MP.6, MP.8	use the constant of proportionality in an equation to represent a proportional relationship.
3-5	7.RP.A.2a, 7.RP.A.2b, 7.RP.A.2d MP.2, MP.3, MP.4, MP.7	use a graph to determine whether two quantities are proportional.

3-6	7.RP.A.2, 7.RP.A.3 MP.1, MP.2, MP.5, MP.7	determine whether a relationship is proportional and use representations to solve problems.

Assessments	
Formative	- Topic Readiness Assessments - SCOUT Observation Assessments - Guided Practice - Practice & Problem Solving Exit Tickets - Lesson Quick Check Quizzes - Mid-Topic Assessments - Progress Monitoring Assessments
Summative	- End of Topic Assessments - Topic Performance Tasks - Topic STEM Project
Benchmark	- Cumulative Assessments - Common Core Standards Practice Tests
Alternative	Renaissance Star Assessments

Resources & Materials
- Advanced 7th grade enVision Mathematics Common Core Volume 1   - Formative and Summative Assessments are found here   - Savvas Realize online resources   - Interactive student edition   - Visual learning   - Activities and Examples   - Videos   - Practice   - Tutorials – Virtual Nerd   - Math tools   - Games   - Assessment

        o   Glossary – read and listen to English/Spanish definitions
- Khan Academy
- MathXL

Interdisciplinary Connections

- MS-PS3-1 Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
- MS-PS3-5 Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.
- MS-PS4-1 Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.

Integration of Technology

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

Career Education- NJSLS 9

- 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances.

Unit Overview

Content Area: Mathematics

Unit Title: Unit 3 – Expressions and Equations

Grade Level: Advanced 7   **Pacing:** 23 – 27 days

Unit Summary:

   Students focus on developing how to write, simplify, and evaluate expressions, linear equations, and inequalities. Students use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems. Students will use properties of operations to generate equivalent expressions. Students explore and solve real-life mathematical problems using numerical and algebraic

expressions and equations. The unit includes a variety of tasks that allow students to explore the ways to solve equations and inequalities, while also applying these skills to real-world contexts.

Students also focus on formulating and reasoning about expressions and equations. Students use linear equations to represent, analyze, and solve a variety of problems. Students recognize equations for proportions (y/x = m or y = mx) as special linear equations (y = mx + b), understanding that the constant of proportionality (m) is the slope, and the graphs are lines through the origin. They understand that the slope (m) of a line is a constant rate of change, so that if the input or x-coordinate changes by an amount A, the output or y-coordinate changes by the amount m · A.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
5-1	7.EE.B.3, 7.EE.B.4 MP.2, MP.4, MP.6, MP.7	write and evaluate algebraic expressions.
5-2	7.EE.A.1 MP.1, MP.2, MP.3	write equivalent expressions for given expressions.
5-3	7.EE.A.1 MP.1, MP.2, MP.3, MP.7	use properties of operations to simplify expressions.
5-4	7.EE.A.1, 7.EE.A.2 MP.1, MP.4, MP.7	expand expressions using the Distributive Property.
5-5	7.EE.A.1, 7.EE.A.2 MP.1, MP.2, MP.3, MP.8	use common factors and the Distributive Property to factor expressions.
5-6	7.EE.A.1, 7.EE.A.2 MP.1, MP.2, MP.4,	add expressions that represent real-world problems.

	MP.6, MP.7	
5-7	7.EE.A.1, 7.EE.A.2 MP.1, MP.3, MP.4, MP.7	subtract expressions using properties of operations.
5-8	7.EE.A.2 MP.2, MP.7	use an equivalent expression to find new information.
6-1	7.EE.B.4 MP.2, MP.4, MP.7	represent a problem with a two-step equation.
6-2	7.EE.B.3, 7.EE.B.4a MP.1, MP.7	solve a problem with a two-step equation.
6-3	7.EE.B.3, 7.EE.B.4a MP.1, MP.2, MP.3, MP.4, MP.7	use the Distributive Property to solve equations.
6-4	7.EE.B.4b MP.2, MP.4	solve inequalities using addition or subtraction.
6-5	7.EE.B.4b MP.2, MP.3, MP.6, MP.7	solve inequalities using multiplication or division.
6-6	7.EE.B.4b MP.1, MP.2, MP.4, MP.7	write and solve two-step inequalities.
6-7	7.EE.B.4b MP.2, MP.3, MP.4, MP.7	solve inequalities that require multiple steps.
7-1	8.EE.C.7b	solve equations that have like terms on one side.

	MP.1, MP.2, MP.4, MP.7	
7-2	8.EE.C.7b MP.2, MP.4	solve equations with variables on both sides of the equal sign.
7-3	8.EE.C.7b MP.2, MP.4, MP.7	solve multistep equations and pairs of equations using more than one approach.
7-4	8.EE.C.7a MP.1, MP.2, MP.3, MP.4, MP.7	determine the number of solutions an equation has.
7-5	8.EE.B.5 MP.1, MP.3, MP.4, MP.8	compare proportional relationships represented in different ways.
7-6	8.EE.B.6 MP.2, MP.3, MP.7	understand the slope of a line.
7-7	8.EE.B.6 MP.2, MP.4, MP.7, MP.8	write equations to describe linear relationships.
7-8	8.EE.B.6 MP.3, MP.4, MP.6, MP.7	find the y-intercept of a graph and explain what it means.
7-9	8.EE.B.6 MP.2, MP.6, MP.7, MP.8	derive the equation $y = mx + b$.

Assessments	
Formative	● Topic Readiness Assessments ● SCOUT Observation Assessments

	● Guided Practice ● Practice & Problem Solving Exit Tickets ● Lesson Quick Check Quizzes ● Mid-Topic Assessments ● Progress Monitoring Assessments
Summative	● End of Topic Assessments ● Topic Performance Tasks ● Topic STEM Project
Benchmark	● Cumulative Assessments ● Common Core Standards Practice Tests
Alternative	● Renaissance Star Assessments

Resources & Materials

- Advanced 7th grade enVision Mathematics Common Core Volume 1 and Volume 2
  - Formative and Summative Assessments are found here
- Savvas Realize online resources
  - Interactive student edition
  - Visual learning
  - Activities and Examples
  - Videos
  - Practice
  - Tutorials – Virtual Nerd
  - Math tools
  - Games
  - Assessment
  - Glossary – read and listen to English/Spanish definitions
- Khan Academy
- MathXL

Interdisciplinary Connections

- MS-ESS1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
- MS-ESS1-4 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.

Climate Change Integration

- ∉ **7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. **For example:** If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation. highlighted as an opportunity for inclusion in an interdisciplinary climate change unit.
  - **Climate Change Example:** Students may solve multi-step real-life problems posed with positive and negative rational numbers in any form related to the relationship between altitude and the temperature above sea level.

Integration of Technology

- 9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

Career Education- NJSLS 9

- 9.2.8.CAP.20: Identify the items to consider when estimating the cost of funding a business.

Unit Overview

Content Area: Mathematics

Unit Title: Unit 4 – Connect Proportional Relationships and Equations to Percent Problems

Grade Level: Advanced 7   **Pacing:** 10 – 12 days

Unit Summary:

Students focus on developing an understanding of and applying proportional relationships to percent problems. Students extend their understanding of proportional relationships and

writing and solving equations to develop percent equations. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
4-1	7.RP.A.3 MP.1, MP.2, MP.3, MP.7	understand, find, and analyze percents of numbers.
4-2	7.RP.A.2c, 7.RP.A.3 MP.1, MP.2, MP.3, MP.7	use proportions to solve percent problems.
4-3	7.RP.A.2c, 7.RP.A.3 MP.1, MP.2, MP.3, MP.4, MP.6, MP.7	represent and solve percent problems using equations.
4-4	7.RP.A.3 MP.1, MP.3, MP.4, MP.6, MP.7	solve problems involving percent change and percent error.
4-5	7.RP.A.3 MP.1, MP.2, MP.4, MP.8	solve problems involving percent markup and markdown.
4-6	7.RP.A.3 MP.1, MP.2, MP.3	apply percent reasoning to solve simple interest problems.

Assessments	
Formative	● Topic Readiness Assessments

	SCOUT Observation Assessments ● Guided Practice ● Practice & Problem Solving Exit Tickets ● Lesson Quick Check Quizzes ● Mid-Topic Assessments ● Progress Monitoring Assessments
Summative	● End of Topic Assessments ● Topic Performance Tasks ● Topic STEM Project
Benchmark	● Cumulative Assessments ● Common Core Standards Practice Tests
Alternative	● Renaissance Star Assessments

Resources & Materials

- Advanced 7th grade enVision Mathematics Common Core Volume 1
  - Formative and Summative Assessments are found here
- Savvas Realize online resources
  - Interactive student edition
  - Visual learning
  - Activities and Examples
  - Videos
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  - Tutorials – Virtual Nerd
  - Math tools
  - Games
  - Assessment
  - Glossary – read and listen to English/Spanish definitions
- Khan Academy
- MathXL

Interdisciplinary Connections

- MS-ESS1-1 Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

- 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.

Integration of Technology
● 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.

Career Education- NJSLS 9
● 9.2.8.CAP.14: Evaluate sources of income and alternative resources to accurately compare employment options.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 5 – Statistics and Probability
Grade Level: Advanced 7 **Pacing:** 15 – 17 days
Unit Summary: Students focus on drawing inferences about populations based on samples. Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences. Students investigate chance processes and develop, use and evaluate probability models.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
8-1	7.SP.A.1 MP.1, MP.2, MP.3, MP.6, MP.8	determine if a sample is representative of a population.
8-2	7.SP.A.1, 7.SP.A.2, 7.RP.A.2c MP.1, MP.2, MP.3, MP.4	make inferences about a population from a sample data set.
9-1	7.SP.C.5, 7.EE.B.3 MP.1, MP.2, MP.3, MP.4	describe the likelihood that an event will occur.
9-2	7.SP.C.6, 7.RP.A.2c MP.1, MP.2, MP.3, MP.4, MP.7	determine the theoretical probability of an event.
9-3	7.SP.C.6, 7.SP.C.7 MP.2, MP.3, MP.7	determine the experimental probability of an event.
9-4	7.SP.C.7a, 7.SP.C.7b, 7.EE.B.3 MP.2, MP.3, MP.4, MP.6, MP.7	use probability models to find probabilities of events.
9-5	7.SP.C.8b MP.1, MP.2, MP.7, MP.8	find all possible outcomes of a compount event.
9-6	7.SP.C.8a MP.1, MP.4, MP.7, MP.8	find the probability of a compound event.

9-7	7.SP.C.8c MP.1, MP.3, MP.4, MP.5, MP.7	simulate a compount event to approximate its probability.

Assessments	
Formative	● Topic Readiness Assessments ● SCOUT Observation Assessments ● Guided Practice ● Practice & Problem Solving Exit Tickets ● Lesson Quick Check Quizzes ● Mid-Topic Assessments ● Progress Monitoring Assessments
Summative	● End of Topic Assessments ● Topic Performance Tasks ● Topic STEM Project
Benchmark	● Cumulative Assessments ● Common Core Standards Practice Tests
Alternative	● Renaissance Star Assessments

Resources & Materials

• Advanced 7th grade enVision Mathematics Common Core Volume 2
   o Formative and Summative Assessments are found here
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• Khan Academy

- MathXL

Interdisciplinary Connections

- MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- MS-ETS1-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Climate Change Integration

- **8.SP.A.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. highlighted as an opportunity for inclusion in an interdisciplinary climate change unit.
  - **Climate Change Example:** Students may construct and interpret scatterplots of measurement data to investigate patterns of association in bivariate data involving the amount of a greenhouse gas in the atmosphere and its effect on temperature.
- **8.SP.A.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.highlighted as an opportunity for inclusion in an interdisciplinary climate change unit.
  - **Climate Change Example:** Students may use the equation of a linear model to interpret the slope when comparing local and global precipitation rates for rainfall in different regions.

Integration of Technology

- 9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.
- 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping.

Career Education- NJSLS 9
• 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.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 6 – Geometry
Grade Level: Advanced 7   **Pacing:** 35 – 41 days

Unit Summary:
 	
   Students focus on solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume. Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity, they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.
 	
   Students then focus on analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem. Students use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems. Students show that the sum of the angles in a triangle is the angle formed by a straight line, and that various configurations of lines give rise to similar triangles because of the angles created when a transversal cuts parallel lines. Students understand the statement of the Pythagorean Theorem and its converse, and can explain why the Pythagorean Theorem holds, for example, by decomposing a square in two different ways. They apply the Pythagorean Theorem to find distances between points on the coordinate plane, to find lengths, and to analyze polygons. Students complete their work on volume by solving problems involving cones, cylinders, and spheres.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
10-1	7.G.A.1 MP.2, MP.7, MP.8	use the key in a scale drawing to find missing measures.
10-2	7.G.A.2, MP.1, MP.2, MP.3, MP.5	draw figures with given conditions.
10-3	7.G.A.2 MP.1, MP.7, MP.8	draw triangles when given information about their side lengths and angle measures.
10-4	7.G.B.5 MP.2, MP.3, MP.7	solve problems involving angle relationships.
10-5	7.G.B.4, 7.EE.B.4a MP.1, MP.6, MP.6, MP.7, MP.8	solve problems involving radius, diameter, and circumference of circles.
10-6	7.G.B.4, 7.EE.B.4a, 7.EE.B.3 MP.2, MP.6, MP.7	solve problems involving area of a circle.
10-7	7.G.A.3 MP.1, MP.6, MP.7, MP.8	determine what the cross section looks like when a 3D figure is sliced.
10-8	7.G.B.6, 7.NS.A.3, 7.EE.B.3, 7.EE.B.4a MP.1, MP.2, MP.7	find the area and surface area of 2-dimensional composite shapes and 3-dimensional prisms.

10-9	7.G.B.6, 7.NS.A.3, 7.EE.B.3, 7.EE.B.4a MP.1, MP.2, MP.4, MP.7	use the area of the base of a three-dimensional figure to find its volume.
11-1 – 11-4	8.G.A.1a, 8.G.A.1b, 8.G.A.1c, 8.G.A.3 MP.1 - MP.8	translate, reflect, and rotate two-dimensional figures. Students will be able to describe and perform a sequence of transformations.
11-5	8.G.A.2, 8.G.A.3 MP.2, MP.3, MP.7	use a sequence of translations, reflections, and rotations to show that figures are congruent.
11-6 – 11-7	8.G.A.3, 8.G.A.4 MP.2, MP.3, MP.6, MP.7, MP.8	use a sequence of transformations, including dilations, to show that figures are similar.
11-8 – 11-10	8.G.A.5 MP.2, MP.3, MP.4, MP.5, MP.7, MP.8	identify and find the measures of angles formed by parallel lines and a transversal. Students will be able to find the interior and exterior angle measures of a triangle, as well as, determine if two triangles are similar.
12-1	8.G.B.6, 8.G.B.7 MP.1, MP.2, MP.3, MP.4, MP.7, MP.8	use the Pythagorean Theorem to find unknown sides of triangles.
12-2	8.G.B.6, 8.G.B.7 MP.3, MP.4, MP.7, MP.8	use the Converse of the Pythagorean Theorem to identify right triangles.
12-3	8.G.B.7 MP.1, MP.2, MP.3, MP.7, MP.8	use the Pythagorean Theorem to solve problems.
12-4	8.G.B.8 MP.3, MP.4, MP.7, MP.8	use the Pythagorean Theorem to find the distance between two points in the coordinate plane.

13-1 – 13-4	8.G.C.9 MP.1 - MP.8	find surface area of three-dimensional figures and the volume of cylinders, cones, and spheres.

Assessments	
Formative	● Topic Readiness Assessments ● SCOUT Observation Assessments ● Guided Practice ● Practice & Problem Solving Exit Tickets ● Lesson Quick Check Quizzes ● Mid-Topic Assessments ● Progress Monitoring Assessments
Summative	● End of Topic Assessments ● Topic Performance Tasks ● Topic STEM Project
Benchmark	● Cumulative Assessments ● Common Core Standards Practice Tests
Alternative	● Renaissance Star Assessments

Resources & Materials

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   o Math tools
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   o Glossary – read and listen to English/Spanish definitions
• Khan Academy
• MathXL

Interdisciplinary Connections
• MS-LS1-1 Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

Climate Change Integration

• **7.G.B.6** Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. highlighted as an opportunity for inclusion in an interdisciplinary climate change unit.
    ○ **Climate Change Example**: Students may solve real-world problems involving area, surface area, and volume related to deforestation and increasing livestock farming as key contributors to climate change.
• **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. highlighted as an opportunity for inclusion in an interdisciplinary climate change unit.
    ○ **Climate Change Example:** Students may use the formula for the volume of a sphere to approximate the volume of hailstones to consider how climate change may affect the size of hailstones over time.

Integration of Technology
• 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.

Career Education- NJSLS 9
• 9.2.12.CAP.6: Identify transferable skills in career choices and design alternative career plans based on those skills.

Accommodations and Modifications for All Units	
Special Education	● Follow 504/IEP accommodations ● Step by step examples

	• Visual demonstration of skill or activity • Allow for flexible grouping • Student centered activities • Learning Stations • Small group & large group discussions • Problem solving situations • Restate, reword, clarify directions • Provide Educational "breaks" as necessary • Utilize visual and audio cues
English Language Learners	• Step by step examples • Visual demonstration of skill or activity • Allow for flexible grouping • Student centered activities • Learning Stations • Small group & large group discussions • Problem solving situations • Utilize visual and audio cues • Highlight, define, or demonstrate important vocabulary • Restate, reword, clarify directions
Students At-Risk of School Failure	• Step by step examples • Visual demonstration of skill or activity • Allow for flexible grouping • Student centered activities • Learning Stations • Small group & large group discussions • Problem solving situations • Utilize visual and audio cues • Highlight, define, or demonstrate important vocabulary • Restate, reword, clarify directions • Chunking content into small segments • Shorten or reduce assignment to focus on one specific skill
Gifted and Talented	• Student Choice • Student centered activities • Enhance skill or activity based on Individual Student Need • Allow for flexible grouping • Problem solving situations
Students with 504 Plans	• Follow 504/IEP accommodations • Step by step examples • Visual demonstration of skill or activity • Allow for flexible grouping • Student centered activities

	● Learning Stations ● Small group & large group discussions ● Problem solving situations ● Restate, reword, clarify directions ● Provide Educational "breaks" as necessary ● Utilize visual and audio cues

Unit Overview
Content Area: Mathematics
Unit Title: Unit 1 – Exponents, Irrational Numbers, and Linear Equations.
Grade Level: 8   **Pacing:** 41-46 days
Unit Summary: Unit 1 introduces learners to concept of irrational numbers, requiring them to classify numbers as either rational or irrational and approximate irrational expressions using rational numbers. The unit continues with the understanding and application of integer exponents and scientific notation. Learners not only know the properties of exponents, but also apply those properties to efficiently simplify and/or rewrite exponential expressions. With respect to scientific notation, learners perform simple mathematical operations with numbers written in scientific notation and make comparisons between two quantities by estimating numbers written in scientific notation. Learners solve linear equations in one variable, including using square root and cube root symbols to represent solutions to simple equations.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
1-1	8.NS.A.1 MP.2, MP.6, MP.7	write repeating decimals as fractions.
1-2	8.NS.A.1	classify a number as rational or irrational and determine

	8.NS.A.3 MP.1, MP.2, MP.3, MP.7, MP.8	whether sum, difference, product, or quotient of two real numbers represents a rational number or an irrational number.
1-4	8.EE.A.2a 8.EE.A.2b MP.2, MP.3, MP.7, MP.8	evaluate square roots of small perfect squares and cube roots of small perfect cubes and simplify square roots of nonperfect squares.
1-3	8.NS.A.2 MP.1, MP.2, MP.3, MP.4, MP.7	compare and order real numbers.
1-5	8.EE.A.2 MP.2, MP.3, MP.6, MP.7, MP.8	solve equations using square roots and cube roots.
1-6	8.EE.A.1 MP.3, MP.4, MP.7	generate equivalent expressions using the following properties of integer exponents: product of powers, quotient of powers, power of a power and power of a product properties .
1-7	8.EE.A.1 MP.2, MP.3, MP.6, MP.7	simplify exponential expressions using the zero exponent property and the negative exponent property.
1-8	8.EE.A.3 MP.3, MP.6, MP.7	estimate very large and very small quantities using a power of 10.
1-9	8.EE.A.4 MP.3, MP.5, MP.7	convert numbers in scientific notation to standard form and vice versa.
1-10	8.EE.A.4 MP.3, MP.6, MP.7	add, subtract, multiply, and divide numbers expressed in scientific notation.
2-1	8.EE.C.7b	combine like terms to solve equations.

	MP.1, MP.2, MP.4, MP.5, MP.7	
2-2	8.EE.C.7b MP.2, MP.4, MP.5	solve equations with variables on both sides.
2-3	8.EE.C.7b MP.2, MP.4, MP.7	solve multistep equations.
2-4	8.EE.C.7a MP.1, MP.2, MP.3, MP.4, MP.7	determine if an equation has no solutions, one solution, or infinitely many solutions.

Assessments	
Formative	● Topic Readiness Assessments ● Guided Practice ● Practice & Problem Solving Exit Tickets ● Lesson Quick Check Quizzes ● Mid-Topic Assessments ● Progress Monitoring Assessments
Summative	● End of Topic Assessments ● Topic Performance Tasks ● Topic STEM Project
Benchmark	● Cumulative Assessments ● Common Core Standards Practice Tests
Alternative	● Renaissance Star Assessments

Resources & Materials

● 8th grade enVision Mathematics Common Core Volume 1
    ○ Formative and Summative Assessments are found here
● Savvas Realize online resources
    ○ Interactive student edition

- o   Visual learning
- o   Activities and Examples
- o   Videos
- o   Practice
- o   Tutorials – Virtual Nerd
- o   Math tools
- o   Games
- o   Assessment
- o   Glossary – read and listen to English/Spanish definitions
- o   MathXL
- Khan Academy
- IXL

Interdisciplinary Connections

- **MS-PS1-1** Develop models to describe the atomic composition of simple molecules and extended structures. (8.EE.A.3)
- **MS-PS3-1** Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. (8.EE.A.1, 8.EE.A.2)

Integration of Technology

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

- 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Career Education- NJSLS 9

- 9.2.8.CAP.20: Identify the items to consider when estimating the cost of funding a business.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 2 – Linear Relationships and Functions.
Grade Level: 8 **Pacing:** 45-49 days
Unit Summary: Units 2 introduces learners to the idea of a function as a precursor to concepts about functions that are included in the high school standards. Learners begin the unit describing qualitatively the relationship between two quantities by analyzing a graph as an informal introduction to functions. They describe a function more formally by identifying it as a rule that assigns to each input exactly one output. In this unit, the concepts developed in grades 6 and 7 such as modeling relationships with variables and equations and ratio and proportional reasoning, are used to make connections between proportional relationships, lines, and linear equations. Learners graph linear functions, construct a function to model a linear relationship, interpret the rate of change and initial value of a linear function in a real-world context, and compare linear functions presented in different ways. The unit concludes with analyzing and solving pairs of simultaneous linear equations. Learners solve systems of linear equations algebraically, and solve real-world mathematical problems leading to two linear equations in two variables.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will...**
2-5	8.EE.B.5 MP.1, MP.3, MP.4, MP.8	analyze equations, linear graphs, and tables to find unit rates and compare proportional relationships.
2-6	8.EE.B.6 MP.2, MP.3, MP.7	connect proportional relationships and slope.
2-7	8.EE.B.6 MP.2, MP.4, MP.7, MP.8	analyze linear equations in the form y=mx .

2-8	8.EE.B.6 MP.4, MP.7	understand the meaning of y-intercept of a line.
2-9	8.EE.B.6 MP.2, MP.6, MP.7, MP.8	analyze linear equations in the form y=mx+b .
3-1	8.F.A.1 MP.2, MP.3, MP.4, MP.7, MP.8	identify whether a relation is a function.
3-2	8.F.A.1 MP.3, MP.4, MP.5, MP.8	identify linear and nonlinear functions in different representations: equations, tables, and graphs.
3-3	8.F.A.3, 8.F.A.2 MP.2, MP.4, MP.7	compare linear and nonlinear functions.
3-4	8.F.B.4, 8.F.A.2 MP.1, MP.2, MP.3, MP.4, MP.6, MP.8	construct functions to model linear relationships.
3-5	8.F.B.5 MP.1, MP.2, MP.3, MP.7	describe intervals of increase and decrease.
3-6	8.F.B.5 MP.1, MP.2, MP.4, MP.7, MP.8	sketch functions from verbal descriptions .
5-1	8.EE.C.8b, 8.EE.C.8c MP.2, MP.3, MP.7, MP.8	estimate number of solutions of a system of equations by inspection .
5-2	8.EE.C.8a,	solve systems by graphing.

	8.EE.C.8c MP.2, MP.3, MP.4	
5-3	8.EE.C.8b, 8.EE.C.8c MP.2, MP.3, MP.6, MP.8	solve systems by substitution.
5-4	8.EE.C.8b, 8.EE.C.8c MP.3, MP.4, MP.7	solve systems by elimination.

Assessments	
Formative	- Topic Readiness Assessments - Guided Practice - Practice & Problem Solving Exit Tickets - Lesson Quick Check Quizzes - Mid-Topic Assessments - Progress Monitoring Assessments
Summative	- End of Topic Assessments - Topic Performance Tasks - Topic STEM Project
Benchmark	- Cumulative Assessments - Common Core Standards Practice Tests
Alternative	Renaissance Star Assessments

Resources & Materials
8th grade enVision Mathematics Common Core Volume 1 and Volume 2   - Formative and Summative Assessments are found here   - Savvas Realize online resources   - Interactive student edition   - Visual learning   - Activities and Examples

- o Videos
  - o Practice
  - o Tutorials – Virtual Nerd
  - o Math tools
  - o Games
  - o Assessment
  - o Glossary – read and listen to English/Spanish definitions
  - o MathXL
- Khan Academy
- IXL

Interdisciplinary Connections

- **MS-PS3-1** Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. (8.F.A.3)
- **MS-PS3-5** Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. (8.F.A.3)
- **MS-PS4-1** Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. (8.F.A.3)

Integration of Technology

- 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

Career Education- NJSLS 9

- 9.2.8.CAP.6: Compare the costs of postsecondary education with the potential increase in income from a career of choice.

Unit Overview

Content Area: Mathematics

Unit Title: Unit 3 – Pythagorean Theorem, Congruence and Similarity

Grade Level:	8	Pacing: 50-54 days

Unit Summary:

    Unit 3 starts with an analysis of transformations (reflections, rotations, translations, and dilations) in which learners should develop an understanding of congruence and similarity. They 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. They understand that a two-dimensional figure is similar to another if the second can be obtained from the first by dilations. These understandings are then used to establish facts about the angle sum and exterior angle of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. The unit then provides a continuation of solving linear equations as it pertains to the Pythagorean Theorem. Learners apply the Pythagorean Theorem to find unknown side lengths of right triangles in both two- and three-dimensional figures, and to find distances between coordinate points on a coordinate plane. The unit concludes with solving problems involving volume of cylinders, cones, and spheres.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will...**
6-1	8.G.A.1a, 8.G.A.1b, 8.G.A.1c, 8.G.A.3 MP.3, MP.4, MP.6, MP.7, MP.8	analyze translations.
6-2	8.G.A.1a, 8.G.A.1b, 8.G.A.1c, 8.G.A.3 MP.1, MP.2, MP.3, MP4, MP.7, MP.8	analyze reflections.
6-3	8.G.A.1a, 8.G.A.1b, 8.G.A.1c, 8.G.A.3 MP.2, MP.3, MP.4	analyze rotations.

6-4	8.G.A.1a, 8.G.A.1b, 8.G.A.1c, 8.G.A.3 MP.1, MP.2, MP.4, MP.6, MP.7	compose transformations.
6-5	8.G.A.2, 8.G.A.3 MP.2, MP.3, MP.7	understand congruent figures.
6-6	8.G.A.3, 8.G.A.4 MP.2, MP.3, MP.7, MP.8	describe dilations.
6-7	8.G.A.3, 8.G.A.4 MP.2, MP.3, MP.6, MP.7, MP.8	understand similar figures.
6-8	8.G.A.5 MP.2, MP.5, MP.7	understand the relationships of angles formed by parallel lines and a transversal.
6-9	8.G.A.5 MP.2, MP.4, MP.7, MP.8	find unknown interior and exterior angles of triangles.
6-10	8.G.A.5 MP.2, MP.3	determine whether triangles are similar.
7-1	8.G.B.6, 8.G.B.7 MP.3, MP.7, MP.8	understand the Pythagorean Theorem .
7-2	8.G.B.6, 8.G.B.7 MP.3, MP.4, MP.7, MP.8	understand the Converse of the Pythagorean Theorem.
7-3	8.G.B.7 MP.1, MP.2, MP.3,	apply the Pythagorean Theorem and its converse.

	MP.7, MP.8	
7-4	8.G.B.8 MP.3, MP.4, MP.7, MP.8	find distance between two points on coordinate plane by using the Pythagorean Theorem.
8-2	8.G.C.9 MP.1, MP.2, MP.7	find volume of cylinders.
8-3	8.G.C.9 MP.2, MP.3, MP.6, MP.7, MP.8	find volume of cones.
8-4	8.G.C.9 MP.4	find volume of spheres.

Assessments	
Formative	- Topic Readiness Assessments - Guided Practice - Practice & Problem Solving Exit Tickets - Lesson Quick Check Quizzes - Mid-Topic Assessments - Progress Monitoring Assessments
Summative	- End of Topic Assessments - Topic Performance Tasks - Topic STEM Project
Benchmark	- Cumulative Assessments - Common Core Standards Practice Tests
Alternative	Renaissance Star Assessments

Resources & Materials
● 8th grade enVision Mathematics Common Core Volume 2

- - Formative and Summative Assessments are found here
- Savvas Realize online resources
  - Interactive student edition
  - Visual learning
  - Activities and Examples
  - Videos
  - Practice
  - Tutorials – Virtual Nerd
  - Math tools
  - Games
  - Assessment
  - Glossary – read and listen to English/Spanish definitions
  - MathXL
- Khan Academy
- IXL

Interdisciplinary Connections

- **W.AW.8.1**. Write arguments on discipline-specific content (e.g., social studies, science, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.

W.IW.8.2. Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

D Use precise language and domain/grade-level- specific vocabulary to inform about or explain the topic.

Climate Change Integration

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. 🌱

Climate Change Example: Students may use the formula for the volume of a sphere to approximate the volume of hailstones to consider how climate change may affect the size of hailstones over time.

Integration of Technology
9.4.8.TL.3: Select appropriate tools to organize and present information digitally.   9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem.

Career Education- NJSLS 9
9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.

Unit Overview
Content Area: Mathematics
Unit Title: Unit 4 – Linear Models for Scatter Plots and Two-Way Tables
Grade Level: 8   **Pacing:** 19-21 days
Unit Summary: Unit 4 provides a continuation of the analysis of linear models as they pertain to bivariate data. Learners investigate patterns of association in bivariate data using scatter plots and two-way tables, including informally fitting and assessing the fit of a linear model for a scatter plot, interpreting the slope and intercept of a linear model in the context of bivariate data, and using joint and relative frequencies of a two-way table to describe possible association between two variables.

Instruction		
Lesson	**Standard(s) & Math Practice(s)**	**Learning Targets (objective) - Students will…**
4-1	8.SP.A.1 MP.2, MP.3, MP.4,	construct and interpret scatter plots .

	MP.6, MP.7, MP.8	
4-2	8.SP.A.2, 8.F.A.3, 8.F.B.4 MP.3, MP.6, MP.7	analyze linear associations.
4-3	8.SP.A.3, 8.F.A.3, 8.F.B.4 MP.1, MP.2, MP.4	use linear models to make predictions.
4-4	8.SP.A.4 MP.1, MP.4, MP.5, MP.7	interpret two-way frequency tables.
4-5	8.SP.A.4 MP.1, MP.2, MP.3, MP.5	interpret two-way relative frequency tables.

Assessments	
Formative	- Topic Readiness Assessments - Guided Practice - Practice & Problem Solving Exit Tickets - Lesson Quick Check Quizzes - Mid-Topic Assessments - Progress Monitoring Assessments
Summative	- End of Topic Assessments - Topic Performance Tasks - Topic STEM Project
Benchmark	- Cumulative Assessments - Common Core Standards Practice Tests
Alternative	Renaissance Star Assessments

Resources & Materials

- 8th grade enVision Mathematics Common Core Volume 1
  - Formative and Summative Assessments are found here
- Savvas Realize online resources
  - Interactive student edition
  - Visual learning
  - Activities and Examples
  - Videos
  - Practice
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  - Glossary – read and listen to English/Spanish definitions
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- Khan Academy
- IXL

Interdisciplinary Connections

- **RI.CR.8.1.** Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) that strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.

Climate Change Integration

- **8.SP.A.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. 🌱
  Climate Change Example: Students may construct and interpret scatterplots of measurement data to investigate patterns of association in bivariate data involving the amount of a greenhouse gas in the atmosphere and its effect on temperature.
- **8.SP.A.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. 🌱
  Climate Change Example: Students may use the equation of a linear model to interpret

the slope when comparing local and global precipitation rates for rainfall in different regions.

Integration of Technology
● 9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.

Career Education- NJSLS 9
● 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.

Accommodations and Modifications for All Units	
Special Education	● Follow 504/IEP accommodations ● Step by step examples ● Visual demonstration of skill or activity ● Allow for flexible grouping ● Student centered activities ● Learning Stations ● Small group & large group discussions ● Problem solving situations ● Restate, reword, clarify directions ● Provide Educational "breaks" as necessary ● Utilize visual and audio cues
English Language Learners	● Step by step examples ● Visual demonstration of skill or activity ● Allow for flexible grouping ● Student centered activities ● Learning Stations ● Small group & large group discussions ● Problem solving situations ● Utilize visual and audio cues ● Highlight, define, or demonstrate

	important vocabulary ● Restate, reword, clarify directions
Students At-Risk of School Failure	● Step by step examples ● Visual demonstration of skill or activity ● Allow for flexible grouping ● Student centered activities ● Learning Stations ● Small group & large group discussions ● Problem solving situations ● Utilize visual and audio cues ● Highlight, define, or demonstrate important vocabulary ● Restate, reword, clarify directions ● Chunking content into small segments ● Shorten or reduce assignment to focus on one specific skill
Gifted and Talented	● Student Choice ● Student centered activities ● Enhance skill or activity based on Individual Student Need ● Allow for flexible grouping ● Problem solving situations
Students with 504 Plans	● Follow 504/IEP accommodations ● Step by step examples ● Visual demonstration of skill or activity ● Allow for flexible grouping ● Student centered activities ● Learning Stations ● Small group & large group discussions ● Problem solving situations ● Restate, reword, clarify directions ● Provide Educational "breaks" as necessary ● Utilize visual and audio cues