SHORE REGIONAL HIGH SCHOOL SENDING DISTRICTS

Collaboration Between Monmouth Beach, Oceanport, and West Long Branch School Districts

Aligned to the New Jersey Student Learning Standards as Applicable

Course Title: Pre-Algebra
Content Area: Mathematics
Grade Level(s): Seven
Course Description: Grade 7 curriculum focuses on 5 main areas. (1) rational Numbers- students will further develop fluency with addition, subtraction, multiplication and division of rational numbers and to use these skills in a problem solving context. (2) Linear Expressions- rewriting linear expressions and solving linear equations. (3) Proportional Relationships- analyze proportional relationships and use them in problem solving. (4) Geometry- using proportional reasoning in context with geometric figures and formulas and (5) Statistics and Probability.
Curriculum Writer(s): Jamie Hahn, Amanda Mergner, Jeff Small, Felicia Tvrdik, and Office of Curriculum and Instruction Staff
Date Created: July 2020
Date Approved by Board of Education: August 2020
Date Revised Curriculum Approved by Board of Education: April 2021

Pacing Guide

Unit 1 Number Sense Topic (1.1-1.10, 2.1-2.3)	25-30 Days
Unit 2 Ratios and Proportional Relationships Topic (3.1-3.6, 4.1-4.6)	15-20 Days
Unit 3 Expressions and Equations Topic (2.4-2.10, 5.1-5.8, 6.1-6.7, 7.1-7.9)	35-50 Days
Unit 4 Statistics and Probability Topic (8.1-8.4, 9.1-9.7)	15-25 Days
Unit 5 Geometry Topic (10.1-10.9, 11.1-10, 12.1-12.4, 13.1-13.4)	35- 55 Days

Unit 1 Number Sense

Topic 1 (1.1-1.10) and Topic 2 (2.1-2.3)

Unit Summary: Students extend their understanding of integers and absolute values and relate them to a number line and apply their understanding to solve real-world problems. Students extend their understanding of fractions as division by dividing the numerator by the denominator and use long division to find decimal equivalents. Students use their understanding of subtracting, adding, multiplying and dividing integers to solve real-world situations. Students extend their understanding of converting fractions to decimals to converting repeating decimals to fractions. Students analyze patterns of repeating decimals and related to multiplying by power of 10 to move repeating digits to the left of the decimal point. Students understand rational and irrational numbers and can categorize the numbers respectively. Students apply their knowledge of perfect squares and decimals to approximate a square root that is an irrational number.

NJSLS Number	NJSLS Content Description
Content Standards	
7.NS.A.1a	Describe situations in which opposite quantities combine to make 0.
7.NS.A.1b	Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
7.NS.A.1c	Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
7.NS.A.1d	Apply properties of operations as strategies to add and subtract rational numbers.

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7.NS.A.2a	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
7.NS.A.2b	Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real world contexts.
7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.
7.NS.A.2d	Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0's or eventually repeats.
7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.
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.
8.NS.A.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
8.NS.A.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).
English Language Arts	
RI.7.1	Cite several pieces of textual evidence and make relevant connections to support analysis of what the text says

	explicitly as well as inferences drawn from the text
W.7.1	Write arguments to support claims with clear reasons and relevant evidence.
W.7.4.	Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience.
W.7.7.	Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.
SL.7.1.	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
SL.7.2.	Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.
SL.7.5.	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
Career Readiness	
9.2.8.CAP.3	Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
Life Literacies and Key Skills	
9.4.8.CT.1	Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
9.4.8.IML.5	Analyze and interpret local or public data sets to summarize and effectively communicate the data.

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Summative Assessments:

- Topic/Unit Assessments
- Standards Based Assessments (Study Island, i-Ready, IXL)
- Constructed Response Questions
- Projects
- Cumulative Tests
- Performance Assessments

Formative Assessments:

- Pre Topic Assessment
- Mid-topic checkpoint and assessment
- Lesson Quizzes
- Lesson self-assessment
- i-Ready Online Instruction/Study Island Modules
- Teacher Observations
- Class Discussions
- Classwork/ Homework
- Standards Based Assessments (Study Island, i-Ready, IXL)
- Exit Slips/Google Form

Alternate and Benchmark Assessments:

- Progress Monitoring Assessments (Forms A, B, and C)
- Topic Cumulative/Benchmark Assessments
- i-Ready Diagnostic Assessment
- Study Island Benchmarks
- End of the Year Placement Test

Aligned to the New Jersey Student Learning Standards as Applicable

Enduring Understandings:

- An integer and its opposite are the same distance from 0 on a number line and have a sum of 0. (7.NS.A.1a)
- Rational numbers expressed as fractions can be written in decimal form. (7.NS.A.2d)
- Adding integers/rational numbers requires adding or subtracting their absolute values and understanding the sign of the sum. (7.NS.A.1b, 7.NS.A.1d, 7NS.A.1b, 7NS.A.1c, 7NS.A.1d)
- The sign of a product is determined by the signs of the factors in a multiplication expression. (7.NS.A.2a, 7.NS.A.2c)
- The same properties used to multiply integers also apply when multiplying rational numbers. (7.NS.A.2a, 7.NS.A.2c)
- The relationship between multiplication and division can be useful when dividing positive and negative integers. (7.NS.A.2b, 7.NS.A.2c)
- Dividing rational numbers is similar to dividing integers. The sign of the quotient depends on the signs of the dividend and divisor. (7.NS.2b, 7.NS.A.2c)
- Problems involving rational numbers can be solved by making sense of the quantities and their relationships to each other. (7.NS.A.3, 7.EE.B.3)
- Repeating decimals can be represented as an equivalent rational number. (8.NS.A.1)
- Every real number is either a rational number or an irrational number. (8.NS.A.1)
- Rational and irrational numbers can be compared and ordered using decimal approximations. (8.NS.A.2)

Essential Questions:

- How can real-world phenomena be expressed algebraically?
- Why is zero called the additive identity?
- How is the addition property of equality used to solve an equation?
- How do you add two integers that have different signs?
- Explain how you subtract one integer from another?

Instructional Outcomes (tied to enduring understandings):

- Students will understand how integers and their opposites are related. (7.NS.A.1a)
- Students will identify rational numbers and write them in decimal form. (7.NS.A.2d)
- Students will add and subtract positive and negative integers and rational numbers (7.NS.A.1b, 7.NS.A.1d, 7NS.A.1b, 7NS.A.1c, 7NS.A.1d)
- Students will multiply positive and negative integers, and apply integer multiplication to real life applications. (7.NS.A.2a, 7.NS.A.2c)
- Students will find the product of rational numbers (7.NS.A.3, 7.EE.B.3)
- Students will understand how to divide integers by applying the rules of multiplying integers. (7.NS.A.2b, 7.NS.A.2c)

- Students will understand how the signs of integers in a multiplication sentence relate to the signs in a related division statement. (7.NS.2b, 7.NS.A.2c)
- Students will decide which operations to use to solve problems and use precision when solving problems with rational numbers. (7.NS.A.3, 7.EE.B.3)
- Students will locate repeating decimals on a number line and write decimals as fractions (8.NS.A.1)
- Students will classify a number as rational or irrational, and understand the concepts of square roots and perfect squares. (8.NS.A.1)
- Students will approximate square roots by using perfect squares, and then compare and order rational and irrational numbers (8.NS.A.2)

Suggested Learning Activities:

Digital and Textbook Activities from EnVisionmath 2.0

- enVision STEM project- *How cold is too cold?* Envisions Stem Project on Climate Change affecting animals.
- Pick a project
- 3-Act Mathematical Modeling Lesson
- Today's Challenge
- Mid-topic performance task
- MathXL for School
- Math Tools Activities

Additional Activities

- Quizizz
- Kahoot!
- IXL
- Khan Academy
- Kuta worksheets
- Scavenger Hunts
- Edulastic
- Delta Math
- Edpuzzle

- Desmos

Curriculum Development Resources: (textbook, trade books, supplemental materials)

- *enVision Mathematics Common Core (2021)* Pearson
- NJDOE Model Curriculum Grade 7
- NJDOE Model Curriculum Grade 8
- NJ Student Learning Standards for Mathematics

Notes/Comments: *Corresponds to Topics (1.1-1.10) and Topic 2 (2.1-2.3) in enVision Mathematics Common Core (2021).*

Modifications (ELL, Special Education, At-Risk Students, Gifted & Talented, & 504 Plans)	
Supports for ELL Students:	• Work toward longer passages as skills in English increase • Use visuals • Introduce/highlight key vocabulary before lesson • Teacher models reading aloud daily • Provide peer tutoring • Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers • Guided notes and/or scaffold outline for written assignments • Provide students with English Learner leveled readers • Support recommended by the grade specific "can do" list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts
Supports for Students With IEPs	• Allow extra time to complete assignments or tests • Guided notes and/or scaffold outline for written assignments • Work in a small group • Solidify and refine concepts through repetition

	• Allow answers to be given orally or dictated • Use multi-sensory teaching approaches • Utilize assistive technology and materials • Use large print books, Braille, or books on CD (digital text) • Follow all IEP modifications
Supports for At-Risk Students	• Guided notes and/or scaffold outline for written assignments • Introduce key vocabulary before lesson • Work in a small group • Lesson taught again using a differentiated approach • Allow answers to be given orally or dictated • Use visuals / Anchor Charts • Leveled texts according to ability
Supports for Gifted and Talented	• Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) • Provide options, alternatives and choices to differentiate and broaden the curriculum • Organize and offer flexible small group learning activities • Provide whole group enrichment explorations • Teach cognitive and methodological skills • Use center, stations, or contracts • Organize integrated problem-solving simulations • Propose interest-based extension activities • Expose students to beyond level texts.
Supports for Students with 504 Plans:	• Follow all the 504 plan modifications • Text to speech/audio recorded selections • Amplification system as needed

	• Leveled texts according to ability • Fine motor skill stations embedded in rotation as needed • Modified or constrained spelling word lists • Provide anchor charts with high frequency words and phonemic patterns

Unit 2 Ratio and Proportional Relationships

Topic 3 (3.1-3.6) and Topic 4 (4.1-4.6)

Unit Summary: Students understand and reason about ratios and rates, and make comparisons with unit rates. Students apply what they know about equivalent ratios and unit rates to solve multi-step problems in real-world situations. Students relate the use of a table of equivalent ratios to the procedure of dividing by the second term of a ratio, or multiplying by its reciprocal, to find the associated unit rate. Students extend their understanding and skills with unit rates and fraction operations as they solve problems involving ratios of fractions. Students look for equivalent ratios to determine if a relationship is proportional. Students learn how to represent a proportional relationship with an equation using the constant of proportionality. Students use equations to solve problems involving proportional relationships. Students understand the characteristics of a graph of a proportional relationship. Students interpret points on graphs of proportional relationships in the context of real-world situations.Students apply what they know about additive and multiplicative relationships to solve problems. Students calculate percent change and percent error in real-world situations. Students use their mathematical understanding of percent and interest to solve real-world problems.

NJSLS Number	**NJSLS Content Description**
Content Standards	
7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
7.RP.A.2	Recognize and represent proportional relationships between quantities.

7.RP.A.2a	Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
7.RP.A.2c	Represent proportional relationships by equations.
7.RP.A.2d	Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.
7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.
English Language Arts	
RI.7.1	Cite several pieces of textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text
W.7.1	Write arguments to support claims with clear reasons and relevant evidence.
W.7.4.	Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience.
W.7.7.	Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.
SL.7.1.	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
SL.7.2.	Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

SL.7.5.	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
Career Readiness	
9.2.8.CAP.3	Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
Life Literacies and Key Skills	
9.4.8.IML.11	Predict the personal and community impact of online and social media activities.

Summative Assessments:

- Topic/Unit Assessments
- Standards Based Assessments (Study Island, i-Ready, IXL)
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- Projects
- Cumulative Tests
- Performance Assessments

Formative Assessments:

- Pre Topic Assessment
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Alternate and Benchmark Assessments:

- Progress Monitoring Assessments (Forms A, B, and C)
- Topic Cumulative/Benchmark Assessments
- i-Ready Diagnostic Assessment
- Study Island Benchmarks
- End of the Year Placement Test

Enduring Understandings:

- Equivalent ratios and unit rates can be used to compare ratios and solve problems. (7.RP.A.1, 7.RP.A.3)
- A unit rate can be easier to use to solve problems than a ratio of fractions. (7.RP.A.1, 7.RP.A.3)
- Quantities in a proportional relationship can be described by equivalent ratios. (7.RP.A.2a)
- Equations in the form y = kx, where k is the constant of proportionality, can be used to represent proportional relationships and solve problems. (7.RP.A.2b, 7.RP.A.2c)
- The graph of a proportional relationship is a straight line through the origin. (7.RP.A.2a, 7.RP.A.2b, 7.RP.A.2d)
- By recognizing proportional quantities, you can use what you know about proportional relationships to solve problems. (7.RP.A.2, 7.RP.A.3)
- Equivalent ratios can be used to find the percent of a number. Percent is a ratio out of 100 that relates the ratio of two quantities. (7.RP.A.3)
- The part divided by the whole and the percent divided by 100 are equivalent ratios. (7.RP.A.2c, 7.RP.A.3)
- Proportional reasoning can be used to develop the percent equation, which in turn, can be used to find the percent, part, or whole. (7.RP.A.2c, 7.RP.A.3)
- Both the percent change and percent error involve finding the ratio of a difference of two values to one of those values. (7.RP.A.3)
- A markup is the same as a percent increase, and a markdown is the same as a percent decrease. The method used to calculate percent change can be used to calculate markups and markdowns. (7.RP.A.3)
- Each value in the annual simple interest formula, $I = p \times r$, corresponds to a value in the percent equation, part = percent × whole. The part corresponds to the interest, the whole to the principal (initial amount), and the percent to the interest rate. (7.RP.A.3)

Essential Questions:

- How does your understanding of ratios impact you as a consumer?

- How can you recognize and represent proportional relationships and use them to solve problems?
- How can you recognize and represent proportional relationships and use them to solve problems?
- What is the constant of proportionality?
- How do you predict future probabilities based on data?

Instructional Outcomes (tied to enduring understandings):

- Students will use ratios and rates to describe the relationship between two quantities, and find equivalent ratios and use unit rates to solve multi-step problems. (7.RP.A.1, 7.RP.A.3)
- Students will find unit rates with ratios of fractions and use unit rates to solve multi-step problems. (7.RP.A.1, 7.RP.A.3)
- Students will determine whether quantities are proportional by testing for equivalent ratios. (7.RP.A.2a)
- Students will use the constant of proportionality to write equations and solve problems involving proportional relationships. (7.RP.A.2b, 7.RP.A.2c)
- Students will use a graph to recognize proportionality, identify a constant of proportionality, and interpret a point on a graph of a proportional relationship. (7.RP.A.2a, 7.RP.A.2b, 7.RP.A.2d)
- Students will explain whether a situation represents a proportional relationship. (7.RP.A.2, 7.RP.A.3)
- Students will understand that equivalent rates can be used to find percents. (7.RP.A.3)
- Students will construct a percent proportion and use it to find an unknown part, whole, or percent. (7.RP.A.2c, 7.RP.A.3)
- Students will understand the relationship between proportional reasoning and percent and apply it to a real life scenario. (7.RP.A.2c, 7.RP.A.3)
- Students will understand the percent equation to solve real world problems involving percent change and percent error. (7.RP.A.3)
- Students will understand and calculate markups and markdowns and relate percent change to both. (7.RP.A.3)
- Students will identify the parts of interest problems and how the values are related and be able to calculate simple interest. (7.RP.A.3)

Suggested Learning Activities:

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Additional Activities

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Notes/Comments: *Corresponds to Topic 3 (3.1-3.6) and Topic 4 (4.1-4.6) in enVision Mathematics Common Core (2021).*

Modifications (ELL, Special Education, At-Risk Students, Gifted & Talented, & 504 Plans)	
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	• Introduce/highlight key vocabulary before lesson • Teacher models reading aloud daily • Provide peer tutoring • Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers • Guided notes and/or scaffold outline for written assignments • Provide students with English Learner leveled readers • Support recommended by the grade specific "can do" list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts
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Unit 3 Expressions and Equations

Topic 2 (2.4-2.10), Topic 5 (5.1-5.8) , Topic 6 (6.1-6.7) and Topic 7 (7.1-7.9)

Unit Summary: Students reinforce their knowledge of perfect squares and square roots. They expand their knowledge to include developing and understanding of perfect perfect cubes and cube roots. Students solve real-world problems with square roots and cube roots. Students will apply their understanding of scientific notation to powers of ten . Students understand why generating equivalent expressions can provide a different perspective on a problem. Students will write and solve two step equations & inequalities using addition, subtraction, multiplication, and division. Students will be

introduced to solving equations with no solutions or infinitely many solutions. Students will reinforce comparing proportional relationships and slope. The students will analyze linear equations and understand the y intercept of a line.

NJSLS Number	NJSLS Content Description
Content Standards	
7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7.EE.A.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
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.
7.EE.B.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
7.EE.B.4a	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.
7.EE.B.4b	Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.
8.EE.A.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions.

8.EE.A.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares.
8.EE.A.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.
8.EE.A.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
8.EE.B.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.
8.EE.B.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.
8.EE.C.7a	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
8.EE.C.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
English Language Arts	
RI.7.1	Cite several pieces of textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text

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W.7.1	Write arguments to support claims with clear reasons and relevant evidence.
W.7.4.	Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience.
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Career Readiness	
9.2.8.CAP.3	Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
Life Literacies and Key Skills	
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).

Summative Assessments:

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Alternate and Benchmark Assessments:

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- End of the Year Placement Test

Enduring Understandings:

- To find the square root of a number, find the factor whose square is equal to that number. To find a cube root, find the factor whose cube is equal to that number. (8.EE.A.2)
- Solve equations with squares by taking the square root of each side of the equation(8.EE.A.2)

- The properties of exponents are used to simplify expressions by adding, subtracting, multiplying, or dividing either the base or the exponents. (8.EE.A.1)
- Any nonzero number raised to the power of zero is equal to 1. Any nonzero number raised to a negative power is equal to its multiplicative reciprocal. (8.EE.A.1)
- An estimate of a very small or very large quantity can be written as a single digit times a power of ten. (8.EE.A.3)
- Scientific notation is an efficient way to write very small or very large numbers. (8.EE.A.4)
- Operating with numbers in scientific notation is an efficient way to add, subtract, multiply, and divide very large or very small numbers. (8.EE.A.4)
- Algebraic expressions can be used to represent and solve problems in real-world contexts. (7.EE.B.3, 7.EE.B.4)
- Rearranging or combining like terms does not change the value of an expression. (7.EE.A.1)
- All like terms must be combined in order for expressions to be simplified. (7.EE.A.1)
- Expanded expressions represent an equivalent way to represent the original expression. (7.EE.A.1, 7.EE.A.2)
- The Distributive Property and common factors are used to factor expressions. (7.EE.A.1, 7.EE.A.2)
- The same rules apply for coefficients and constants when adding expressions. (7.EE.A.1, 7.EE.A.2)
- Add the inverse when subtracting expressions. (7.EE.A.1, 7.EE.A.2)
- Understanding mathematical structure is important for solving deeper, unconventional expressions. (7.EE.A.2)
- Equations with more than one operation can be used to represent a situation. (7.EE.B.4)
- One- and two-step problems are both solved using the properties of equality. (7.EE.B.3, 7.EE.B.4a)
- The Distributive Property can be used to solve equations in the form p(x+q)=r. (7.EE.B.3, 7.EE.B.4a)
- Solving inequalities with addition and subtraction is the same as solving equations. The inverse relationship between addition and subtraction is used to isolate the variable. (7.EE.B.4b)
- Solving inequalities with multiplication and division is the same as solving equations. In an inequality, when multiplying or dividing by a negative value, in the inequality symbol is reversed. (7.EE.B.4b)
- Multi-step inequalities, like two-step inequalities, have more than one step and more than one operation. To solve a two-step inequality, add or subtract the constant, and then multiply or divide to isolate the variable. (7.EE.B.4b)
- Combining like terms that are on one side of an equation makes it easier to solve for the variable by using inverse operations. (8.EE.C.7b)
- To solve a linear equation that has variable terms on both sides of the equation, first use inverse operations to move all variable terms to one side of the equation and constant terms to the other. Then, isolate the variable. (8.EE.C.7b)
- The Distributive Property is an important tool for simplifying expressions and combining like terms. (8.EE.C.7b)

- Equations with one variable can have zero, one, or infinitely many solutions. (8.EE.C.7a)
- Proportional relationships can be represented using different models using tables, graphs, and tables. (8.EE.B.5)
- Slope is a measure of the steepness of a line and is equal to the rate of change between quantities. (8.EE.B.6)
- The slope, constant of proportionality, and unit rate are equal for proportional relationships. (8.EE.B.6)
- The y-intercept of a line is the y-coordinate of the point where the graph of the line crosses the y-axis. (8.EE.B.6)
- The slope-intercept form for a linear equation, y=mx+b, gives information to sketch a graph of the line. It indicates that the point (0,b) is on the graph of the line and shows that the slope of the line is m. (8.EE.B.6)

Essential Questions:

- How can properties of operations help to generate equivalent expressions that can be used in solving problems?
- How can you solve real-world mathematical problems with numerical and algebraic equations and inequalities?
- How can we analyze connections between linear equations and use them to solve problems?

Instructional Outcomes (tied to enduring understandings):

- Students will evaluate square roots, cube roots, perfect squares, and perfect cubes to solve problems. (8.EE.A.2)
- Students will solve equations involving perfect squares, perfect cubes, imperfect squares or imperfect cubes. (8.EE.A.2)
- Students will multiply and divide expressions with integer exponents; find the power or a power. (8.EE.A.1)
- Students will simplify exponential expressions using the Zero Exponent Property and the Negative Exponent Property. (8.EE.A.1)
- Students will estimate and compare very large and very small quantities using powers of 10. (8.EE.A.3)
- Students will write very large and very small numbers in scientific notation; convert scientific notation to standard form. (8.EE.A.4)
- Students will add, subtract, multiply, and divide numbers in scientific notation. (8.EE.A.4)
- Students will understand how variables are used to represent unknown values in problems. (7.EE.B.3, 7.EE.B.4)
- Students will recognize when two expressions are equivalent; use properties of operations to write equivalent expressions. (7.EE.A.1)
- Students will combine like integer and rational terms. (7.EE.A.1)
- Students will use the Distributive Property to expand expressions. (7.EE.A.1, 7.EE.A.2)
- Students will understand that expanding an expression is the reverse of factoring; Identify the GCF of algebraic terms in expressions. (7.EE.A.1, 7.EE.A.2)
- Students will use properties of operations to add expressions, and model addition of expressions in real life applications. (7.EE.A.1, 7.EE.A.2)

- Students will use properties of operations to subtract expressions, and model subtraction of expressions in real life applications. (7.EE.A.1, 7.EE.A.2)
- Students will write equivalent expressions to show how quantities are related in real-life applications. (7.EE.A.2)
- Students will analyze word problems to write two-step equations. (7.EE.B.4)
- Students will use models to solve two-step equations, and compare algebraic and arithmetic solutions. (7.EE.B.3, 7.EE.B.4a)
- Students will solve equations using the Distributive Property. (7.EE.B.3, 7.EE.B.4a)
- Students will graph the solution of inequalities on a number line and solve inequalities using Addition and Subtraction Properties of Inequality. (7.EE.B.4b)
- Students will graph the solution of an inequality on a number line and solve them using Multiplication and Division Properties of Inequalities. (7.EE.B.4b)
- Students will write and solve a two-step inequality to solve a problem. (7.EE.B.4b)
- Students will apply the Distributive Property to simplify and solve multi-step inequalities. (7.EE.C.7b)
- Students will combine like terms; solve equations with like terms on one side of the equation. (8.EE.C.7b)
- Students will solve equations with like terms on both sides of the equation. (8.EE.C.7b)
- Students will determine the number of solutions to an equation. (8.EE.C.7a)
- Students will analyze equations, linear graphs, and tables to find unit rates and compare proportional relationships. (8.EE.B.5)
- Students will find the slope of a line using different strategies; interpret slope on context and relate it to steepness on a graph. (8.EE.B.6)
- Students will understand how the constant of proportionality and the slope relate in a linear equation; write and graph a linear equation in the form $y=mx$. (8.EE.B.6)
- Students will interpret and extend the table or graph of a linear relationship to find its y-intercept. (8.EE.B.6)
- Students will graph a line from an equation in the form $y=mx+b$; write an equation that represents the given graph of a line. (8.EE.B.6)

Suggested Learning Activities:

Digital and Textbook Activities from EnVisionmath 2.0

- enVision STEM project
- Pick a project
- 3-Act Mathematical Modeling Lesson
- Today's Challenge

- Mid-topic performance task
- MathXL for School
- Math Tools Activities

Additional Activities

- Quizizz
- Kahoot!
- IXL
- Khan Academy
- Kuta worksheets
- Scavenger Hunts
- Edulastic
- Delta Math
- Edpuzzle
- Desmos

Curriculum Development Resources: (textbook, trade books, supplemental materials)

- *enVision Mathematics Common Core (2021)* Pearson
- NJDOE Model Curriculum Grade 7
- NJDOE Model Curriculum Grade 8
- NJ Student Learning Standards for Mathematics

Notes/Comments: *Corresponds to Topic 2 (2.4-2.10), Topic 5 (5.1-5.8) , Topic 6 (6.1-6.7) and Topic 7 (7.1-7.9) in enVision Mathematics Common Core (2021).*

Modifications (ELL, Special Education, At-Risk Students, Gifted & Talented, & 504 Plans)	
Supports for ELL Students:	• Work toward longer passages as skills in English increase

	• Use visuals • Introduce/highlight key vocabulary before lesson • Teacher models reading aloud daily • Provide peer tutoring • Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers • Guided notes and/or scaffold outline for written assignments • Provide students with English Learner leveled readers • Support recommended by the grade specific "can do" list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts
Supports for Students With IEPs	• Allow extra time to complete assignments or tests • Guided notes and/or scaffold outline for written assignments • Work in a small group • Solidify and refine concepts through repetition • Allow answers to be given orally or dictated • Use multi-sensory teaching approaches • Utilize assistive technology and materials • Use large print books, Braille, or books on CD (digital text) • Follow all IEP modifications
Supports for At-Risk Students	• Guided notes and/or scaffold outline for written assignments • Introduce key vocabulary before lesson • Work in a small group • Lesson taught again using a differentiated approach • Allow answers to be given orally or dictated • Use visuals / Anchor Charts • Leveled texts according to ability

Supports for Gifted and Talented	• Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) • Provide options, alternatives and choices to differentiate and broaden the curriculum • Organize and offer flexible small group learning activities • Provide whole group enrichment explorations • Teach cognitive and methodological skills • Use center, stations, or contracts • Organize integrated problem-solving simulations • Propose interest-based extension activities • Expose students to beyond level texts.
Supports for Students with 504 Plans:	• Follow all the 504 plan modifications • Text to speech/audio recorded selections • Amplification system as needed • Leveled texts according to ability • Fine motor skill stations embedded in rotation as needed • Modified or constrained spelling word lists • Provide anchor charts with high frequency words and phonemic patterns

Unit 4 Statistics and Probability

Topic 8 (8.1-8.4) and Topic 9 (9.1-9.7)

Unit Summary: Students learn that a representative sample can be selected at random and includes members from all parts of the population in question. Students practice differentiating between populations, samples, and representative samples to cement their understanding of these concepts. Students understand that random samples can be used to make valid inferences about populations. Students apply what they know about samples and proportional relationships to make inferences about populations, and determine if their inferences are valid. Students apply what they know about data distributions and measure of center and variability to understand how two populations compare. Students use mean, mode, range, and MAD to compare

two populations. Students make inferences about the populations based on the data distributions and statistics of center and variability. Students develop an initial understanding of a concept of probability. Students evaluate the likelihood of various events and decide whether a game is mathematically fair. Students understand how to simulate the probability of a compound event and to determine the probability of the event. Students apply what they know about sample spaces, outcomes and probability models to simulate the probability of an event occurring in the future.

NJSLS Number	NJSLS Content Description
Content Standards	
7.SP.A.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
7.SP.A.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.
7.SP.B.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
7.SP.B.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.
7.SP.C.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
7.SP.C.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.

7.SP.C.7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
7.SP.C.7a	Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
7.SP.C.7b	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
7.SP.C.8a	Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
7.SP.C.8b	Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.
7.SP.C.8c	Design and use a simulation to generate frequencies for compound events.
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.
7.RP.A.2c	Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.
English Language Arts	
RI.7.1	Cite several pieces of textual evidence and make relevant connections to support analysis of what the text says

	explicitly as well as inferences drawn from the text
W.7.1	Write arguments to support claims with clear reasons and relevant evidence.
W.7.4.	Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience.
W.7.7.	Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.
SL.7.1.	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
SL.7.2.	Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.
SL.7.5.	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
Career Readiness	
9.2.8.CAP.3	Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
Life Literacies and Key Skills	
9.4.8.IML.11	Predict the personal and community impact of online and social media activities.
9.4.8.DC.7	Collaborate within a digital community to create a digital artifact using strategies such as crowdsourcing or digital surveys.

Summative Assessments:

- Topic/Unit Assessments

- Standards Based Assessments (Study Island, i-Ready, IXL)
- Constructed Response Questions
- Projects
- Cumulative Tests
- Performance Assessments

Formative Assessments:

- Pre Topic Assessment
- Mid-topic checkpoint and assessment
- Lesson Quizzes
- Lesson self-assessment
- i-Ready Online Instruction/Study Island Modules
- Teacher Observations
- Class Discussions
- Classwork/ Homework
- Standards Based Assessments (Study Island, i-Ready, IXL)
- Exit Slips/Google Form

Alternate and Benchmark Assessments:

- Progress Monitoring Assessments (Forms A, B, and C)
- Topic Cumulative/Benchmark Assessments
- i-Ready Diagnostic Assessment
- Study Island Benchmarks
- End of the Year Placement Test

Enduring Understandings:

- Representative samples must reflect the entire population. The best way to determine a representative sample is to make sure the sample is randomly chosen. (7.SP.A.1)
- Data from random samples can be used to make valid inferences about a population by looking for patterns or trends in the distribution of the

data, using measures of center and variation in the data, or by writing a proportion given the number of items in the entire population. (7.SP.A.1, 7.SP.A.2, 7.RP.A.2c, 7.EE.B.3)

- Data displays, such as box plots, can be used to make informal comparative influence about two populations. One can compare the shapes of the data displays or the measures of center and variability. (7.SP.B.3, 7.SP.B.4)
- You can use dot plots to compare populations based on measures of center and variability. You can use statistical measures, such as mean and MAD, to make inferences and predictions about populations. (7.SP.B.3, 7.SP.B.4)
- Probability is the likelihood an event will occur. Probability can be described using a ratio such as 1 out of 2. The closer the ratio is to 0 the less likely it is to occur. The closer the value is to 1 is more likely the event will occur. (7.SP.C.5, 7.EE.B.3)
- Theoretical probability of an event is the number of favorable outcomes divided by the number of possible outcomes, when all outcomes are equally likely. (7.SP.C.6, 7.RP.A.2c)
- Theoretical probability is calculated based on an equation. Experimental probability consists of the results of an actual experiment. These probabilities are often very close, but are usually not identical. (7.SP.C.6, 7.SP.C.7)
- A probability model can be used to evaluate a chance process and its outcomes to develop theoretical or experimental probability. The model has a sample space, a list of events, and the probability of each event. (7.SP.C.7a, 7.SP.C.7b, 7.EE.B.3)
- The possible outcomes of a compound event (a combination of two or more events) can be represented using a tree diagram, a table, or an organized list. (7.SP.C.8b)
- A model, such as a table, organized list, or tree diagram, can represent the sample space of a compound event. The sample space can then be used to determine the probability of a favorable outcome. (7.SP.C.8a)
- The experimental probability of an outcome can be found by first assigning outcomes to devices such as spinners, coins, and number cubes. These can be used to model the experimental probability of an event. (7.SP.C.8c)

Essential Questions:

- How can we gather, organize and display data to communicate and justify results in the real world?
- How can sampling be used to draw inferences about one or more populations?
- How can you investigate change processes and develop, use, and evaluate probability models?
- Can you use probability to predict future events?

Instructional Outcomes (tied to enduring understandings):

- Students will distinguish between a population and a sample, establish whether a sample is representative of a population, and generate random samples. (7.SP.A.1)
- Students will make qualitative and quantitative inferences from a sample data set, and make estimates on a sample data set to assess whether inferences are valid. (7.SP.A.1, 7.SP.A.2, 7.RP.A.2c, 7.EE.B.3)
- Students will draw comparative inferences about two populations using median and interquartile range (IQR) (7.SP.B.3, 7.SP.B.4)
- Students will analyze populations using the mean, median, mode, range, interquartile range, and mean absolute deviation. (7.SP.B.3, 7.SP.B.4)
- Students will use probability to describe the likelihood that an event will occur and relate probability to mathematical fairness. (7.SP.C.5, 7.EE.B.3)
- Students will determine the theoretical probability of an event and use it to predict an outcome. (7.SP.C.6, 7.RP.A.2c)
- Students will compare theoretical and experimental probability and use experimental probability to make predictions. (7.SP.C.6, 7.SP.C.7)
- Students will develop and use probability models to evaluate a situation. (7.SP.C.7a, 7.SP.C.7b, 7.EE.B.3)
- Students will use a tree diagram, a table, or an organized list to represent the sample space for a compound event. (7.SP.C.8b)
- Students will find the probability of a compound event using a table, tree diagram, or organized list. (7.SP.C.8a)
- Students will simulate a compound event to approximate its probability (7.SP.C.8c)

Suggested Learning Activities:

Digital and Textbook Activities from EnVisionmath 2.0

- enVision STEM project
- Pick a project
- 3-Act Mathematical Modeling Lesson
- Today's Challenge
- Mid-topic performance task
- MathXL for School
- Math Tools Activities

Additional Activities

- Quizizz
- Kahoot!
- IXL

- Khan Academy
- Kuta worksheets
- Scavenger Hunts
- Edulastic
- Delta Math
- Edpuzzle
- Desmos
- Investigating Climate Change

Curriculum Development Resources: (textbook, trade books, supplemental materials)

- *enVision Mathematics Common Core (2021)* Pearson
- NJDOE Model Curriculum Grade 7
- NJDOE Model Curriculum Grade 8
- NJ Student Learning Standards for Mathematics

Notes/Comments: *Corresponds to Topic 8 (8.1-8.4) and Topic 9 (9.1-9.7) in enVision Mathematics Common Core (2021).*

Modifications (ELL, Special Education, At-Risk Students, Gifted & Talented, & 504 Plans)	
Supports for ELL Students:	• Work toward longer passages as skills in English increase • Use visuals • Introduce/highlight key vocabulary before lesson • Teacher models reading aloud daily • Provide peer tutoring • Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers • Guided notes and/or scaffold outline for written assignments • Provide students with English Learner leveled readers

	• Support recommended by the grade specific "can do" list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts
Supports for Students With IEPs	• Allow extra time to complete assignments or tests • Guided notes and/or scaffold outline for written assignments • Work in a small group • Solidify and refine concepts through repetition • Allow answers to be given orally or dictated • Use multi-sensory teaching approaches • Utilize assistive technology and materials • Use large print books, Braille, or books on CD (digital text) • Follow all IEP modifications
Supports for At-Risk Students	• Guided notes and/or scaffold outline for written assignments • Introduce key vocabulary before lesson • Work in a small group • Lesson taught again using a differentiated approach • Allow answers to be given orally or dictated • Use visuals / Anchor Charts • Leveled texts according to ability
Supports for Gifted and Talented	• Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) • Provide options, alternatives and choices to differentiate and broaden the curriculum • Organize and offer flexible small group learning activities • Provide whole group enrichment explorations • Teach cognitive and methodological skills • Use center, stations, or contracts • Organize integrated problem-solving simulations

	● Propose interest-based extension activities ● Expose students to beyond level texts.
Supports for Students with 504 Plans:	● Follow all the 504 plan modifications ● Text to speech/audio recorded selections ● Amplification system as needed ● Leveled texts according to ability ● Fine motor skill stations embedded in rotation as needed ● Modified or constrained spelling word lists ● Provide anchor charts with high frequency words and phonemic patterns

Unit 5 Geometry

Topic 10 (10.1-10.9) , Topic 11 (11.1-10) , Topic 12 (12.1-12.4), and Topic 13 (13.1-13.4)

Unit Summary: Students learn the concept of scale on a scale drawing and understand the proportional relationship between a figure and its model. Students apply ratios and proportional reasoning to solve multi-step problems involving a scale drawing. Students apply their understanding of quadrilaterals & triangles to solve real-world problem situations. Students will develop fluency with calculating the measure of angles using angle relationships. Students will apply angle relationships in different real-world scenarios to determine angle measures.Students will become fluent in calculating the circumference, diameter, or radius of a circle. Students will understand the equation $a=m^2$ and how it can be used to solve for area, radius, or diameter of a circle. Students use cross-sections to solve problems. Students extend their knowledge of areas of polygons and nets of solids to more complex figures. Students apply their understanding of translations, reflections rotations and sequences of transformations to identify congruent figures and scale factors. Students apply their understanding of preimage and image to learn the concept of dilation and scale factor. Students apply their knowledge of graphs and coordinates to find required transformations. Students understand that the intersection of parallel lines and a transversal create sets of angles whose measures have a relationship. Students learn how the interior angle measures and exterior angle measures of triangles are related. Students apply the pythagorean theorem to solve real-world problems involving distances on maps and between points on a coordinate grid. Students will become fluent in calculating the surface area & volume of a cylinder, cone, and sphere.

NJSLS Number	NJSLS Content Description
Content Standards	
7.G.A.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
7.G.A.2	Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

Aligned to the New Jersey Student Learning Standards as Applicable

7.G.A.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
7.G.B.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
7.G.B.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
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.
7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.
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.
7.EE.B.4a	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.
8.G.A.1a	Lines are transformed to lines, and line segments to line segments of the same length.
8.G.A.1b	Angles are transformed to angles of the same measure.
8.G.A.1c	Parallel lines are transformed to parallel lines.

8.G.A.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
8.G.A.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
8.G.A.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
8.G.A.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.
8.G.B.6	Explain a proof of the Pythagorean Theorem and its converse.
8.G.B.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems in two and three dimensions.
8.G.B.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
8.G.C.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
English Language Arts	
RI.7.1	Cite several pieces of textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text
W.7.1	Write arguments to support claims with clear reasons and relevant evidence.
W.7.4.	Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task,

	purpose, and audience.
W.7.7.	Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.
SL.7.1.	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
SL.7.2.	Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.
SL.7.5.	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
Career Readiness	
9.2.8.CAP.3	Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
Life Literacies and Key Skills	
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 (e.g., 6.SP.B.4, 7.SP.B.8b).
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1)

Summative Assessments:

- Topic/Unit Assessments
- Standards Based Assessments (Study Island, i-Ready, IXL)
- Constructed Response Questions
- Projects
- Cumulative Tests

- Performance Assessments

Formative Assessments:

- Pre Topic Assessment
- Mid-topic checkpoint and assessment
- Lesson Quizzes
- Lesson self-assessment
- i-Ready Online Instruction/Study Island Modules
- Teacher Observations
- Class Discussions
- Classwork/ Homework
- Standards Based Assessments (Study Island, i-Ready, IXL)
- Exit Slips/Google Form

Alternate and Benchmark Assessments:

- Progress Monitoring Assessments (Forms A, B, and C)
- Topic Cumulative/Benchmark Assessments
- i-Ready Diagnostic Assessment
- Study Island Benchmarks
- End of the Year Placement Test

Enduring Understandings:

- Use a scale drawing to calculate measurements and reproduce proportional scale drawings. (7.G.A.1)
- Understand that drawing a unique quadrilateral needs a combination of side lengths, angle measures, and side angle relationships. (7.G.A.2)
- Understand how to construct triangles with given conditions and determine whether it is a unique triangle, more than one triangle, or no triangle. (7.G.A.2)
- The measure of angles that are formed by intersecting lines and rays can be determined when the relationships between different types of angles are known. (7.G.B.5)

- The circumference and diameter of a circle, regardless of size, have a unique and constant ratio that is an irrational number symbolized by π. (7.G.B.4, 7.EE.B.4a)
- The formula for the area of a circle, $A= \pi r^2$, can be used to solve problems by substituting the known values for area (A) and/or radius (r) to solve for the unknown value. (7.G.B.4, 7.EE.B.4a, 7.EE.B.3)
- A cross section is a two- dimensional figure that is exposed when a three- dimensional figure is sliced by a plane. (7.G.B.3)
- The surface area of a composite figure is the sum of the areas of its surfaces. The surface area of a 3-D figure is the combined surface area of all the faces of the figure. (7.G.B.4)
- To find the volume of a prism, find the area of the base (B) and multiply it by its height. (7.G.B.6, 7.NS.A.3, 7.EE.B.3, 7.EE.B.4a)
- Transformations of figures can include a translation (slide), a reflection (flip), and a rotation (turn). (8.G.A.1a, 8.G.A.1b, 8.G.A.1c, 8.G.A.3)
- When one transformation will not map a preimage into its image, a sequence of transformation is needed. (8.G.A.1a, 8.G.A.1b, 8.G.A.1c, 8.G.A.3)
- A sequence of translations, reflections, and rotations can map one figure to another without changing its shape or size. (8.G.A.2, 8.G.A.3)
- A dilation is a transformation that changes the size of a figure. The preimage and image have the same shape, angles measures, and proportions. (8.G.A.3, 8.G.A.4)
- Two-dimesional figures are similar if there is a sequence of translations, reflections, rotations, and dilations that map one figure onto the other. (8.G.A.3, 8.G.A.4)
- If parallel lines are intersected by a transversal, then corresponding and alternate interior angles are congruent, and same-side interior angles are supplementary. (8.G.A.5)
- The measure of an exterior angle of a triangle is equal to the sum of the measures of its remote interior angles. (8.G.A.5)
- If two angles in one triangle are congruent to two angles in another triangle, the triangles are similar triangles. (8.G.A.5)
- The Pythagorean Theorem can be used to determine if a triangle is a right triangle and to find the missing side length of a triangle. (8.G.B.6, 8.G.B.7)
- You can use $a^2 + b^2 = c^2$ to prove it's a right triangle. (8.G.B.6, 8.G.B.7)
- The Pythagorean Theorem and its converse can be used to solve real-world problems that involve right triangles. (8.G.B.7)
- The Pythagorean Theorem can be used to find the distance between any two points on a coordinate plane by drawing a line to connect the points and using it as the hypotenuse of a right triangle where the legs are the horizontal and vertical distances. (8.G.B.8)
- Formulas for finding the areas of polygons, such as rectangles, squares, triangles and circles, can be used to find the surface areas of cylinders, cones, and spheres. (8.G.C.9)

- Finding the volume of a cylinder is an extension of finding the volume of a rectangular prism. The volume of a rectangular prism is the product of the area of its base and its height. Similarly, the volume of a cylinder is equal to the product of the area of its circular base and its height. (8.G.C.9)
- The volume of a cone is ⅓ the volume of a cylinder given that the bases have the same radius and the heights are the same. The volume of a cone is V=1/3Bh, where B is the area of its circular base and h is the height of the cone. (8.G.C.9)
- The volumes of a sphere and cone are proportionally related. The volume of a sphere is twice the volume of a cone that has the same circular base and height. The formula for the volume of a sphere is $V=4/3\pi r^3$, where r is the radius of the sphere. (8.G.C.9)

Essential Questions:

- How can geometry be used to solve problems?
- How can you show two figures are either congruent or similar to one another?
- How can you use the Pythagorean Theorem to solve problems?
- How are formulas for volume of cylinders, cones, and spheres related to one another?

Instructional Outcomes (tied to enduring understandings):

- Students will use a scale drawing as a representation of actual lengths and area. (7.G.A.1)
- Students will sketch, name, and classify quadrilaterals. (7.G.A.2)
- Students will draw and classify triangles when given information about their side lengths and angle measures. (7.G.A.2)
- Students will solve problems involving angle relationships. (7.G.B.5)
- Students will solve problems involving radius, diameter, and circumference of circles. (7.G.B.4, 7.EE.B.4a)
- Students will solve problems involving the area of a circle. (7.G.B.4, 7.EE.B.3, 7.EE.B.4a)
- Students will determine what the cross section looks like when a 3D figure is sliced. (7.G.A.3)
- Students will find the area and surface area of 2-dimensional composite shapes and 3-dimensional prisms. (7.G.B.6, 7.NS.A.3, 7.EE.B.3, 7.EE.B.4a)
- Students will use the area of the base of a three-dimensional figure to find its volume. (7.G.B.6, 7.NS.A.3, 7.EE.B.3, 7.EE.B.4a)
- Students will use coordinates to describe the rules of a translation. (8.G.A.1a-c, 8.G.A.3)
- Students will translate a two-dimensional figure on a coordinate plane by mapping each of its vertices. (8.G.A.1a-c, 8.G.A.3)
- Students will understand and describe reflections; reflect two-dimensional figures. (8.G.A.1a-c, 8.G.A.3)

- Students will be able to understand and describe translations, reflections, and rotations on a coordinate plane.. (8.G.A.1a, 8.G.A.1b, 8.G.A.1c, 8.G.A.3)
- Students will be able to understand, describe, and perform a sequence of transformations. (8.G.A.1a, 8.G.A.1b, 8.G.A.1c, 8.G.A.3)
- Students will be able to understand and identify congruence of figures using a series of transformations. (8.G.A.2,8.G.A.3)
- Students will be able to understand dilations and dilate to enlarge or reduce a figure in the coordinate plane. (8.G.A.3,8.G.A.4)
- Students will be able to understand similarity, complete a similarity transformation and identify similar figures. (8.G.A.3,8.G.A.4)
- Students will be able to understand the relationships of angles formed by parallel lines and a transversal. (8.G.A.5)
- Students will be able to understand the relationship of the interior angles of a triangle and be able to find unknown angle measures. (8.G.A.5)
- Students will be able to determine whether triangles are similar and solve problems involving similar triangles. (8.G.A.5)
- Given two side lengths of a right triangle, students will be able to use the Pythagorean Theorem to find the length of the third side. (8.G.B.6, 8.G.B.7)
- Students will be able to understand and apply the Converse of the Pythagorean Theorem to identify right triangles and analyze two-dimensional shapes. (8.G.B.6, 8.G.B.7)
- Students will be able to apply the Pythagorean Theorem and its converse to solve real-world problems. (8.G.B.7)
- Students will be able to apply the Pythagorean Theorem to solve problems that involve three dimensions, find the distance between two points and the perimeter of a figure on a map or coordinate plane, and identify the coordinates of the third vertex of a triangle on the coordinate plane. (8.G.B.8)
- Students will find the surface areas of cylinders, cones, and spheres. (8.G.C.9)
- Students will be able to use the formula for the volume of a cylinder to find an unknown measure and solve real-world problems.. (8.G.C.9)
- Students will be able to find the volume of a cone. (8.G.C.9)
- Students will be able to find the volume of a sphere and a composite figure. (8.G.C.9)

Suggested Learning Activities:

Digital and Textbook Activities from EnVisionmath 2.0

- enVision STEM project
- Pick a project
- 3-Act Mathematical Modeling Lesson
- Today's Challenge
- Mid-topic performance task

- MathXL for School
- Math Tools Activity

Additional Activities

- Quizizz
- Kahoot!
- IXL
- Khan Academy
- Kuta worksheets
- Scavenger Hunts
- Edulastic
- Delta Math
- Edpuzzle
- Desmos

Curriculum Development Resources: (textbook, trade books, supplemental materials)

- *enVision Mathematics Common Core (2021)* Pearson
- NJDOE Model Curriculum Grade 7
- NJDOE Model Curriculum Grade 8
- NJ Student Learning Standards for Mathematics

Notes/Comments: *Corresponds to Topic 10 (10.1-10.9) , Topic 11 (11.1-10) , Topic 12 (12.1-12.4), and Topic 13 (13.1-13.4) in enVision Mathematics Common Core (2021).*

Modifications (ELL, Special Education, At-Risk Students, Gifted & Talented, & 504 Plans)	
Supports for ELL Students:	• Work toward longer passages as skills in English increase

	• Use visuals • Introduce/highlight key vocabulary before lesson • Teacher models reading aloud daily • Provide peer tutoring • Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers • Guided notes and/or scaffold outline for written assignments • Provide students with English Learner leveled readers • Support recommended by the grade specific "can do" list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts
Supports for Students With IEPs	• Allow extra time to complete assignments or tests • Guided notes and/or scaffold outline for written assignments • Work in a small group • Solidify and refine concepts through repetition • Allow answers to be given orally or dictated • Use multi-sensory teaching approaches • Utilize assistive technology and materials • Use large print books, Braille, or books on CD (digital text) • Follow all IEP modifications
Supports for At-Risk Students	• Guided notes and/or scaffold outline for written assignments • Introduce key vocabulary before lesson • Work in a small group • Lesson taught again using a differentiated approach • Allow answers to be given orally or dictated • Use visuals / Anchor Charts • Leveled texts according to ability

Supports for Gifted and Talented	• Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) • Provide options, alternatives and choices to differentiate and broaden the curriculum • Organize and offer flexible small group learning activities • Provide whole group enrichment explorations • Teach cognitive and methodological skills • Use center, stations, or contracts • Organize integrated problem-solving simulations • Propose interest-based extension activities • Expose students to beyond level texts.
Supports for Students with 504 Plans:	• Follow all the 504 plan modifications • Text to speech/audio recorded selections • Amplification system as needed • Leveled texts according to ability • Fine motor skill stations embedded in rotation as needed • Modified or constrained spelling word lists • Provide anchor charts with high frequency words and phonemic patterns