NORTHFIELD COMMUNITY SCHOOL
MATHEMATICS CURRICULUM FRAMEWORK
BOE APPROVED AUGUST 2024

GRADE : 8

PACING

PACING	SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE
TOPIC	2D Geometry (8 weeks)		Exponents and Scientific Notation (4 weeks)	Solving Linear Equations (5 weeks)	Graphing/ Writing Linear Equations and Solving Linear Systems and Bivariate Data (9 weeks)		Functions (2 weeks)	Number System: Squares, Cubes, Radicals, Rational & Irrational Numbers and Pythagorean Theorem & Distance (5 weeks)		3D Geometry (2 weeks)
NJSLA Domain	Geometry		Expressions and Equations		Expressions and Equations, Functions, Statistics and Probability		Functions	The Number Systems, Expressions and Equations, Geometry		Geometry
District Assessments	MAP – Fall, Winter, Spring Fluency Test and Constructed Response 2-3 times per year, Fall, Winter (optional), Spring Lesson quizzes - Pre-Assessment and Skill Assessment (Form A or B), teacher made quizzes, modified quizzes Unit Test Assessments- Big Ideas Math Assessments, modified tests, teacher made tests NJSLA Spring									
Mathematical Practices	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with Mathematics. 5. Use appropriate tools strategically. 6. Attend to precision.									

	7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning						
NJSLS Technology	8.1 A 8.1 B 8.1 C 8.1 D 8.1 F 8.2 E	8.1.A 8.1 D	8.1 A 8.1 B 8.1 C 8.1 D 8.2 E	8.1 A 8.1 B 8.1 C 8.1 D 8.1 F 8.2 C 8.2 E	8.1 A	8.1 A 8.1 C 8.1 D 8.2 E	8.1 A 8.1 B 8.1 C 8.1 D 8.1 E 8.1 F 8.2 E
NJSLS Career Readiness Practices	CRP2; CRP4; CRP6; CRP8; CRP11	CRP2; CRP4; CRP7; CRP8; CRP11	CRP2; CRP4; CRP8	CRP2; CRP4; CRP6; CRP7; CRP8; CRP11	CRP2; CRP4; CRP6; CRP8	CRP2; CRP4; CRP6; CRP8; CRP11	CRP2; CRP4; CRP6; CRP8
9.1 Personal Financial Literacy Standards	9.1.8.A.2 9.1.8.A.5 9.1.8.A.7	9.1.8.A.2 9.1.8.A.5 9.1.8.A.7	9.1.8.A.2 9.1.8.A.5 9.1.8.A.7	9.1.8.A.2 9.1.8.A.5 9.1.8.A.7	9.1.8.A.2 9.1.8.A.5 9.1.8.A.7	9.1.8.A.2 9.1.8.A.5 9.1.8.A.7	9.1.8.A.2 9.1.8.A.5 9.1.8.A.7

<u>Mathematics in Grade 8, instructional time should focus on three critical areas</u>:
(1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations;
(2) grasping the concept of a function and using functions to describe quantitative relationships;
(3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

(1) Students use linear equations and systems of 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. Students also use a linear equation to describe the association between two quantities in bivariate data (such as arm span vs. height for students in a classroom). At this grade, fitting the model, and assessing its fit to the data are done informally. Interpreting the model in the context of the data requires students to express a relationship between the two quantities in question and to interpret components of the relationship (such as slope and y-intercept) in terms of the situation. Students strategically choose and efficiently implement procedures to solve linear equations in one variable, understanding that when they use the properties of equality and the concept of logical equivalence, they maintain the solutions of the original equation. Students solve systems of two linear equations in two variables and relate the systems to pairs of lines in the plane; these intersect, are parallel, or are the same line. Students use linear equations, systems of linear equations, linear functions, and their understanding of slope of a line to analyze situations and solve problems.
(2) Students grasp the concept of a function as a rule that assigns to each input exactly one output. They understand that functions describe situations where one quantity determines another. They can translate among representations and partial representations of functions (noting that tabular and graphical representations may be partial representations), and they describe how aspects of the function are reflected in the different representations.
(3) 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.

Grade 8 Overview:

The Number System

- Know that there are numbers that are not rational, and approximate them by rational numbers.

Expressions and Equations

- Work with radicals and integer exponents.

- Understand the connections between proportional relationships, lines, and linear equations.
- Analyze and solve linear equations and pairs of simultaneous linear equations.

Functions

- Define, evaluate, and compare functions.
- Use functions to model relationships between quantities.

Geometry

- Understand congruence and similarity using physical models, transparencies, or geometry software.
- Understand and apply the Pythagorean Theorem.
- Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.

Statistics and Probability

- Investigate patterns of association in bivariate data.

Mathematical Practices:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Social Emotional Learning (SEL) in MATHEMATICS:

Provide students with opportunities to express themselves through discussions that connect to each topic and allow them to explore their feelings about math. Thinking deeply about each topic will help students apply problem solving and critical thinking strategies that will help them reflect on their work and overall performance as well as confidence in mathematics.

- What parts of math make you feel successful?
- What can we learn from our mistakes?

- What self-talk can you use to help you persevere?
- What are positive ways to respond when math starts to feel challenging?
- What can friends say to help us feel better and more successful in math?
- What can we learn from our mistakes in math?
- How can you be a good group member?
- How will you help yourself get “unstuck?”
- Where or when can you use today’s math lesson when you are not in school?
- How do we respond if we don’t agree with someone’s answer or if we know the answer is incorrect?
- How do we feel about solving problems in a different way when asked?
- Did everyone get a fair chance to talk and/or use the manipulatives?

UNIT 1 - 2D Geometry		
Unit Summary	**NJSLS Standards**	**Essential Questions**
Students will be able to define and perform rotations, reflections, translations, and dilations. They will use the coordinate plane to describe the effect of transformations on the pre-image. They will use models to develop their understanding of congruent and similar figures, compare and contrast similarity and congruence, and recognize that translations, reflections, and rotations create congruent figures, whereas dilations create similar figures. Students will identify angles using the properties of intersecting parallel lines cut by a transversal. They will also establish facts about the angle sum and exterior angles of a triangle and the angle-angle criterion for similarity of triangles.	8.G.A.1 8.G.A.2 8.G.A.3 8.G.A.4 8.G.A.5	What are the properties of geometric transformations and what effects do they have on figures? How can congruency and/or similarity between figures be described by transformations? What angle relationships exist for triangles and for parallel lines intersected by a transversal?
Learning Goals:		

Students will be able to

- translate, rotate, reflect, and dilate figures and describe the effects of these transformations using coordinates.
- describe a sequence of transformations that will result in congruent or similar figures.
- apply their understanding of angle relationships to find unknown angles

Fluency Expectations:

Properties of rotations, reflections, translations, and dilations, Prime notation to describe images, Corresponding sides and angles of figures, Congruence and similarity statements/symbols, Sequence of transformations that exhibits the congruence or similarity between 2-D figures, Angles created when parallel lines are cut by a transversal (alternate interior, alternate exterior, corresponding, vertical, adjacent, etc.), Sum of interior angles of a triangle equals 180 degrees, Exterior angle of a triangle is equal to the sum of the two remote interior angles

Modifications and Accommodations (ELL, SE, BSI, G&T, 504):

ELL:

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher models reading aloud daily
- Provide peer tutoring
- Use of Bilingual Dictionary
- Guided notes and/or scaffold outline for written assignments
- Provide students with English Learner leveled readers.

SE:

- Allow extra time to complete assignments or tests
- Guided notes and/or scaffold outline for written assignments
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications

BSI:

- 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

G&T:
● 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.

504:
● 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

Vocabulary: coordinates, axis, two-dimensional, pre-image, image, angle, prime notation, map, transformation, translation, rotation, reflection, dilation, reduction, enlargement, motion rule, origin, corresponding, clockwise, counterclockwise, degree, center of rotation, line of reflection

Resources:
Math textbook, online sites, classroom library, etc

UNIT 2 - Exponents and Scientific Notation		
Unit Summary	**NJSLS Standards**	**Essential Questions**
This unit will introduce the various rules of integer exponents and how to use them to simplify expressions. Students' ability to apply the properties of exponents will then	8.EE.A.1, 3, 4	How are the properties of integer exponents used to generate equivalent numerical expressions? What is the rationale for scientific notation?

be applied to the concept of scientific notation. Students will understand the purpose of scientific notation and demonstrate how to write numbers using this form. They will be able to convert numbers between scientific and standard decimal notation, as well as perform all four math operations using scientific notation. Real-world applications of scientific notation will also be addressed.		How can one use the properties of exponents and scientific notation to represent, compare, and/or perform operations on very large or very small numbers?

Learning Goals:

Students will be able to

- Students will be able to apply the properties of integer exponents to write equivalent numeric expressions.
- Students will be able to write and compare very large or small numbers.
- Students will be able to perform mathematical operations with numbers expressed in scientific and/or decimal notation.

Fluency Expectations:

Exponent rules, Scientific notation form, Scientific notation represented by technology

Modifications and Accommodations (ELL, SE, BSI, G&T, 504):

ELL:

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher models reading aloud daily
- Provide peer tutoring
- Use of Bilingual Dictionary
- Guided notes and/or scaffold outline for written assignments
- Provide students with English Learner leveled readers.

SE:

- Allow extra time to complete assignments or tests
- Guided notes and/or scaffold outline for written assignments
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications

BSI:
- 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

G&T:
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- Modified or constrained spelling word lists
- Provide anchor charts with high frequency words and phonemic patterns

Vocabulary:
Power, base, exponent, product, quotient, simplify, evaluate, decimal form, standard form, scientific notation, coefficient

Resources:
Math textbook, online sites, classroom library, etc

UNIT 3 - Solving Linear Equations

Unit Summary	NJSLS Standards	Essential Questions
This unit covers the solving of linear equations. Students learn to solve equations starting from simple ones and progressing to more complex, multi-step equations involving the distributive property, combining like terms, and variables on both sides. Equations leading to infinite and no solutions will also be explored. The unit concludes with using learned skills to transform equations so that they are solved for a named variable. It will be an important skill for students to rewrite equations in slope-intercept form in later units.	8.EE.C.7a,b	How is a solution to a linear equation derived and the reasonableness of its solution checked? Do linear equations always have one solution? How can equations be rewritten in terms of a specified variable?

Learning Goals:

Students will be able to

- solve linear equations by applying the distributive property, combining like terms, and using inverse operations, and justifying the solutions.
- Students will be able to solve linear equations in one variable that lead to one solution, no solution, or infinite solutions.
- Students will be able to solve an equation in terms of a given variable.

Fluency Expectations:

Inverse operations, Properties of equality, Distributive property, Combining like terms, Solution to a linear equation, No solution and infinitely many solution, outcomes

Modifications and Accommodations (ELL, SE, BSI, G&T, 504):

ELL:

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher models reading aloud daily
- Provide peer tutoring
- Use of Bilingual Dictionary
- Guided notes and/or scaffold outline for written assignments

● Provide students with English Learner leveled readers.

SE:
● Allow extra time to complete assignments or tests
● Guided notes and/or scaffold outline for written assignments
● Work in a small group
● Allow answers to be given orally or dictated
● Use large print books, Braille, or books on CD (digital text)
● Follow all IEP modifications

BSI:
● 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

G&T:
● 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
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504:
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● 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

Vocabulary:
Equation, coefficient, variable, inverse operation, opposites, balancing an equation, equivalency, identity, justify, verify

Resources:
Math textbook, online sites, classroom library, etc

UNIT 4 - Graphing/Writing Linear Equations and Solving Linear Systems and Bivariate Data		
Unit Summary	**NJSLS Standards**	**Essential Questions**
This unit covers how to graph lines and write equations of lines using slope-intercept form. Students will learn how to determine slopes from graphs and by using the slope formula, and will be introduced to slope as the constant rate of change. They will understand the meanings of intercepts, particularly the y-intercept of a line. They will also recognize and graph proportional relationships and make connections between the unit rate and slope. Learners will use similar triangles to explain why the slope is the same between any two distinct points on a non-vertical line in a coordinate plane. Connections will be made between slope and y-intercept of lines and the rate of change and initial value in real-world situations. Students will inspect and compare multiple representations of linear functions from tables, graphs, equations, and verbal situations. Additionally, learners will be able to write and solve equations that represent real-world linear relationships. This unit will allow students to construe meaning for bivariate data, or data that has two variables. Learners will study scatter	8.EE.B.5,6, 8.EE.C.8a,b,c 8.F.A.2 8.F.B.4 8.SP.A.1-4	How can linear equations be graphed on a coordinate plane? How can linear equations be derived and written? How do y-intercept and slope apply to real world situations? How can linear functions, including proportional relationships, represented in multiple ways be compared? Why do similar triangles explain how slope is the same between any two points on a non-vertical line? How can scatter plots and lines of best fit be crafted and used to interpret data and make predictions? How can two-way tables be constructed and Interpreted? How can a pair of linear equations be solved and does a linear system always have a solution?

plots, particularly linear models, and observe patterns or relationships that may exist. They will fit trend lines to the scatter plot graphs, write equations for these lines of best fit, and use the prediction equations to make conjectures about events. Students also will investigate bivariate data and frequencies to construct and interpret two-way tables to summarize statistics. As with scatter plots, these tables can also be used to describe possible associations between the two variables and to forecast events. The unit also includes analyzing and solving systems of equations. Students will discover that a pair of linear equations can have one solution (in the case of intersecting lines), no solution (parallel lines), or infinite solutions (same or coincident lines) by graphing, substitution, and/or combination/elimination techniques. Lastly, writing and solving systems to model real-world situations will also be covered.		

Learning Goals:

Student will be able to

- graph and write linear equations, including those that represent proportional relationships.
- analyze, evaluate, compare, and write linear functions that model real-world relationships between quantities.
- compare linear functions, including proportional relationships, given various representations.
- recognize why similar triangles explain slope of lines.
- analyze and represent bivariate data in scatter plots to show any associations between the quantities, and construct and use lines of best fit/prediction equations.
- build and interpret two-way tables summarizing bivariate data collected from the same subjects to show any patterns between the two variables.
- analyze and solve mathematical and real-world problems involving pairs of linear equations (linear systems).

Fluency Expectations:

x and y intercepts, Slope, Slope-intercept form of linear equations, Horizontal and vertical lines, Rate of change, Initial value, Proportional relationships, Unit rate, Similar triangles, Scatter plots, Correlations, Trend Line/Line of Best Fit/Prediction, Equations, Two-Way Tables,

Relative Frequencies, Outliers, Intersecting lines, Parallel lines, Coinciding lines

Modifications and Accommodations (ELL, SE, BSI, G&T, 504):

ELL:
- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher models reading aloud daily
- Provide peer tutoring
- Use of Bilingual Dictionary
- Guided notes and/or scaffold outline for written assignments
- Provide students with English Learner leveled readers.

SE:
- Allow extra time to complete assignments or tests
- Guided notes and/or scaffold outline for written assignments
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications

BSI:
- 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

G&T:
- 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.

504:
● 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

Vocabulary:
Slope, Rate of Change, Unit Rate, Intercept, Initial Value, Horizontal, Vertical, Undefined, Scatter plot, relationship, Association, Correlation, Clustering, Outlier, line of best fit, trend line, prediction equation, Bivariate data, two-way table, row, Column, Frequency, relative frequency, linear system, system of linear equations, solution, intersect, Parallel, infinite solutions, coincident lines, substitution, linear combinations/elimination

Resources:
Math textbook, online sites, classroom library, etc

UNIT 5 - Functions		
Unit Summary	**NJSLS Standards**	**Essential Questions**
This unit will allow students to define, analyze, interpret, and understand how functions operate and relate to graphs. Students will distinguish between relations and functions, as well as linear vs.nonlinear functions. Learners will characterize functions in terms of increasing vs. decreasing and will evaluate outputs for given inputs and vice versa. They will describe functional relationships	8.F.A.1,3 8.F.B.5	How is a function defined? What distinguishes linear versus non-linear functions? How can a functional relationship modeled in a graph be described qualitatively?

from given graphs and will sketch graphs from verbal descriptions.		

Learning Goals:

Students will be able to

- define, describe, and compare functions.
- distinguish between linear and non-linear functions given graphs, tables, and equations.
- qualitatively describe functional relationships modeled in a graph.

Fluency Expectations:

Functions vs. non-functions (relations), Vertical line test, Linear vs. non-linear functions, Domain/input; Range/output, Interval notation

Modifications and Accommodations (ELL, SE, BSI, G&T, 504):

ELL:

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher models reading aloud daily
- Provide peer tutoring
- Use of Bilingual Dictionary
- Guided notes and/or scaffold outline for written assignments
- Provide students with English Learner leveled readers.

SE:

- Allow extra time to complete assignments or tests
- Guided notes and/or scaffold outline for written assignments
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications

BSI:

- 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

G&T:
● 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.

504:
● 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

Vocabulary:
Function, Relation, Input, Output, Domain, Range, linear function, non-linear function, vertical line test, increasing, decreasing, rate of change, initial value

Resources:
Math textbook, online sites, classroom library, etc

UNIT 6 - Number System: Squares, Cubes, Radicals and Rational & Irrational Numbers and Pythagorean Theorem and Distance		
Unit Summary	**NJSLS Standards**	**Essential Questions**
This unit will allow students to evaluate square roots and cube roots, and solve	8.NS.A.1,2 8.EE.A.2 8.G.B.6,7,8	How can numerical expressions involving squares, cubes, and roots be evaluated or

simple equations using them. Students will explore how to approximate non-perfect square radicals. Additionally, students will define and distinguish between rational and irrational numbers, write rational numbers as fractions or rounded decimals, understand that every number has a decimal expansion, and compare and order real numbers. All of these skills will lead into solving problems involving the Pythagorean Theorem. Students will demonstrate a deep understanding of the Pythagorean Theorem and its converse. They will explain a proof of the theorem, apply the theorem to find missing sides in a right triangle in both two and three dimensions, and model and solve real-world application problems. Students will also determine the distance between two points by constructing a right triangle and using the Pythagorean Theorem to find the missing diagonal side (distance).		estimated and used in solving equations? In what ways can real numbers be classified, represented, and used? How can the Pythagorean Theorem be used to determine unknown side lengths in right triangles? How is the Pythagorean Theorem used to find the distance between two points? How can the Pythagorean Theorem and its converse be modeled?

Learning Goals:

Students will be able to

- evaluate square roots of small perfect squares and cube roots of small perfect cubes, and solve simple equations involving them.
- classify and compare numbers in the real number system, including rational approximations of irrational numbers.
- apply the Pythagorean Theorem to determine unknown side lengths in right triangles in mathematical and real-world problems and to find the distance between two points.
- explain a proof of the Pythagorean and its converse.

Fluency Expectations:

Perfect Squares and Perfect Cubes, Square Roots and Cube Roots of small perfect squares and perfect cubes, Using Square Roots and Cube Roots as inverse operations, Rational vs. Irrational Numbers, Pythagorean Theorem, Converse of The Pythagorean Theorem

Modifications and Accommodations (ELL, SE, BSI, G&T, 504):

ELL:

- Work toward longer passages as skills in English increase
- Use visuals

● Introduce key vocabulary before lesson
● Teacher models reading aloud daily
● Provide peer tutoring
● Use of Bilingual Dictionary
● Guided notes and/or scaffold outline for written assignments
● Provide students with English Learner leveled readers.

SE:
● Allow extra time to complete assignments or tests
● Guided notes and/or scaffold outline for written assignments
● Work in a small group
● Allow answers to be given orally or dictated
● Use large print books, Braille, or books on CD (digital text)
● Follow all IEP modifications

BSI:
● 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

G&T:
● 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.

504:
● 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

Vocabulary:
Square, cube, square root, cube root, radical, perfect square/cube, Pythagorean Theorem, right triangle, Leg, hypotenuse, theorem, proof, converse, Real numbers, Rational, irrational, repeating, terminating, non-repeating, non-terminating

Resources:
Math textbook, online sites, classroom library, etc

UNIT 7 - 3D Geometry

Unit Summary	NJSLS Standards	Essential Questions
This unit will allow students to develop an understanding of the properties of three-dimensional shapes (cylinders, cones, and spheres) and how to calculate their volume. Students will use these volume formulas to solve real world problems.	8.G.C.9	How can formulas for volumes of 3-dimensional figures be used to solve mathematical and real-world problems?

Learning Goals:
Students will be able to
- solve mathematical and real-world problems involving the volumes of cones, cylinders, and spheres.

Fluency Expectations:
Characteristics of and formulas for 3D figures (cones, cylinders, and spheres), Volume Formulas of cones, cylinders, and spheres

Modifications and Accommodations (ELL, SE, BSI, G&T, 504):
ELL:
- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher models reading aloud daily

● Provide peer tutoring
● Use of Bilingual Dictionary
● Guided notes and/or scaffold outline for written assignments
● Provide students with English Learner leveled readers.

SE:
● Allow extra time to complete assignments or tests
● Guided notes and/or scaffold outline for written assignments
● Work in a small group
● Allow answers to be given orally or dictated
● Use large print books, Braille, or books on CD (digital text)
● Follow all IEP modifications

BSI:
● 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

G&T:
● 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.

504:
● 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

Vocabulary:
3-dimensional, Cone, Cylinder, Sphere, Radius, Diameter, Pi, Volume, Base, height

Resources:
Math textbook, online sites, classroom library, etc