Califon Public School
Curriculum

Subject: Mathematics	Grade: 8	Unit #: 1	Pacing: 6 weeks
Unit Title: Real Numbers, Exponents, & Scientific Notation			

OVERVIEW OF UNIT:

This unit starts out by explaining to students how to express a rational number as a decimal, approximate the value of an irrational number, describe the relationship between sets of real numbers, and order a set of real numbers arising from mathematical and real-world contexts. The unit then focuses on how to apply properties of integer exponents to evaluate expressions, convert between large numbers in standard decimal notation and scientific notation, convert between small numbers in standard decimal notation and scientific notation, and apply all four basic operations to numbers written in scientific notation.

Unit References	
Big Ideas	Essential Questions
- Relationships between sets of real numbers - Irrational numbers including pi - Ordering irrational and rational numbers - Properties of integer exponents - Scientific notation - Operations with scientific notation	- How do you rewrite rational numbers and decimals, take square roots and cube roots, and approximate irrational numbers? - How can you describe relationships between sets of real numbers? - How do you order a set of real numbers? - How can you develop and use the properties of integer exponents? - How can you use scientific notation to express very large quantities or very small quantities? - How can you add, subtract, multiply, and divide using scientific notation?

Objectives

- Students will be able to rewrite rational numbers as decimals and decimals as rational numbers.
- Students will be able to solve problems involving square and cube roots.
- Students will be able to describe relationships between sets of real numbers.
- Students will be able to order sets of real numbers.
- Students will be able to develop and apply the properties of integer exponents.
- Students will be able to use scientific notation to express very large and very small quantities.
- Students will be able to apply all operations to solving problems with scientific notation.

Assessment

Formative Assessment:
- Homework assignments
- Quizzes
- Classwork
- Skill worksheets
- Class discussions

Summative Assessment:
- Module Test
- Unit Test
- Performance Task

Benchmark Assessment:
- Link It Benchmark Assessment

Alternative Assessment:
- Performance Task
- Modified Tests (independently developed by teacher)
- Projects

Key Vocabulary

- Integers
- Negative numbers
- Positive numbers
- Whole number
- Real numbers
- Repeating decimal
- Square root
- Terminating decimal

- Cube root
- Irrational numbers
- Perfect cube
- Principal square root
- Rational number

- Base
- Exponent
- Standard notation
- Power
- Scientific notation

Resources & Materials

- Textbook (Go Math Gr. 8)
- SMARTBoard
- Calculator
- Teacher-made materials
- Guided notes
- Online games
- www.khanacademy.org
- www.ixl.com/math/
- my.hrw.com (Go Math Resources)
- www.desmos.com
- http://nlvm.usu.edu/
- https://illuminations.nctm.org/

Technology Infusion

Teacher Technology:
- Google Classroom
- SMARTBoard
- Chromebook
- Google Apps for Education

Student Technology:
- Google Classroom
- Chromebook
- Google Apps for Education
- Quizzizz

- Kahoot!

Activities:
- Students will use the Chromebooks to access Google Classroom and Google Apps for Education to write out explanations for how problems were solved or how math connects to real-life situations.
- Students will use the Chromebooks to access websites like Quizzizz and Kahoot! to practice and review the skills learned throughout the unit.

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

Interdisciplinary Integration

Activities:
- Students will practice using the unit vocabulary as they talk and write about the problems they are solving. Understanding the vocabulary will aid their understanding of the concepts covered in this unit.

Resources:
- Teacher Vision Cross Curricular Theme Map - https://www.teachervision.com/teaching-methods/curriculum-planning/7167.html
- Engineering Go For It! - http://egfi-k12.org/
- US Department of Education STEM - http://www.ed.gov/stem
- Intel STEM Resource - http://www.intel.com/content/www/us/en/education/k12/stem.html
- NASA STEM - http://www.nasa.gov/audience/foreducators/expeditions/stem/#.VYrO2flViko
- PBS STEM - http://www.pbs.org/teachers/stem/#content
- STEM Works - http://stem-works.com/activities
- What Every Education Should Know About Using Google by Shell Education
- Promoting Literacy in all Subjects by Glencoe - http://www.glencoe.com/sec/teachingtoday/subject/promoting_literacy.phtml
- International Literacy Association Read Write Think - http://www.readwritethink.org/

Standard	Standard Description
ELA-Literacy.RST. 6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

21st Century Life Skills

Activities:
- Students will work in groups to collaborate, at times taking leadership roles, to communicate project ideas to the whole class.

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

Careers
Activities:
• Students will discuss and then write detailed explanations utilizing appropriate mathematical vocabulary to explain their thought process for obtaining solutions to specific problems.

Standard	Standard Description
CRP4	Communicate clearly and effectively and with reason.

Common Core State Standards for Mathematical Practice: Bold all that apply	
MP #	Practice
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.**

Standards	
Standard #	Standard Description
8.NS.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.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., $\pi 2$). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $32 \times 3{-}5 = 3{-}3 = 1/33 = 1/27$.
8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form $x2 = p$ and $x3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and

	cube roots of small perfect cubes. Know that √2 is irrational.
8.EE.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.
8.EE.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.

Differentiation			
Special Education	English Language Learners (ELL)	Response to Intervention (RTI)	Enrichment
- Provide modifications & accommodations as listed in the student's IEP - Position student near helping peer or have quick access to teacher - Modify or reduce assignments/tasks - Reduce length of assignment for different mode of delivery - Increase one-to-one time - Prioritize tasks - Use graphic organizers - Use online resources for skill building - Use collaborative grouping strategies such as small groups - NJDOE resources - http://www.state.nj.us/education/specialed/ - Math manipulatives	- Provide text-to-speech - Use of translation dictionary or software - Provide graphic organizers - NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm - Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm	- Tiered interventions following RTI framework - Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/ - Interventional Central - http://www.interventioncentral.org/	- Process should be modified: higher order thinking skills, open-ended thinking, discovery - Utilize project-based learning for greater depth of knowledge - Utilize exploratory connections to higher grade concepts - Contents should be modified: real world problems, audiences, deadlines, evaluations, transformations - Learning environments should be modified: student-centered learning, independence, openness, complexity, groups varied - NJDOE resources - http://www.state.nj.us/education/aps/cccs/g_and_t_req.htm

Califon Public School
Curriculum

Subject: Mathematics	Grade: 8	Unit #: 2	Pacing: 10 weeks
Unit Title: Proportional and Nonproportional Relationships and Functions			

OVERVIEW OF UNIT:

This unit starts out with the students representing and solving problems involving proportional relationships using tables, graphs, and equations. The students will learn how to determine the rate of change or slope and y-intercept using the information provided in the tables, graphs, or equations for each situation. Then the students will shift to representing linear nonproportional relationships with tables, graphs, and equations in the form y = mx + b when b is not equal to 0. Additionally, students will begin to write equations in the form y = mx + b to model a linear relationship between two quantities using verbal, numerical, tabular, and graphical representations. They will begin to contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation. Finally, students will identify functions using sets of ordered pairs, tables, mappings, and graphs; identify examples of proportional and nonproportional functions; distinguish between proportional and nonproportional situations using tables, graphs, and equations; and analyze and interpret graphs.

Unit References	
Big Ideas	Essential Questions
- Linear proportional and nonproportional relationships - Unit rate - Slope - Constant of proportionality - Direct variation - Equations in the form y = mx + b - Systems of equations - Functions	- How can you use tables, graphs, and equations to represent proportional relationships? - How can you find a rate of change or a slope? - How can you interpret the unit rate as slope? - How can you use tables, graphs, and equations to represent linear nonproportional relationships? - How can you determine the slope and y-intercept of a line? - How can you graph a line using the slope and y-intercept? - How can you distinguish between proportional and nonproportional situations? - How do you write an equation to model a linear relationship

given a graph, description, or table?
- How can you contrast linear and nonlinear sets of bivariate data?
- How can you identify and represent functions?
- What are some characteristics that you can use to describe functions?
- How can you use tables, graphs, and equations to compare functions?
- How can you describe a relationship given a graph and sketch a graph given a description?

Objectives

- Students will be able to represent proportional and linear nonproportional relationships using tables, graphs, and equations.
- Students will be able to calculate the rate of change and slope.
- Students will be able to interpret the rate of change as slope.
- Students will be able to calculate the slope and y-intercept of a line.
- Students will be able to utilize the slope and y-intercept to graph a line.
- Students will be able to identify characteristics between proportional and nonproportional situations.
- Students will be able to interpret equations to model a linear relationship when given a graph, description, or table.
- Students will be able to compare and contrast linear and nonlinear sets of bivariate data.
- Students will be able to identify and represent functions.
- Students will be able to describe the characteristics of functions.
- Students will be able to compare and contrast functions using tables, graphs, and equations.
- Students will be able to describe a relationship shown in a graph.
- Students will be able to sketch a graph when given a description.

Assessment

Formative Assessment:
- Homework assignments

Benchmark Assessment:
- Link It Benchmark Assessment

- Quizzes
- Classwork
- Skill worksheets
- Class discussions

Summative Assessment:
- Module Test
- Unit Test
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Alternative Assessment:
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- Projects

Key Vocabulary

- Constant
- Equivalent ratios
- Proportion
- Rate
- Ratios
- Unit rate
- Constant of proportionality
- Proportional relationship
- Rate of change
- Slope
- Ordered pair

- X-coordinate
- Y-coordinate
- Linear equation
- Slope-intercept form of an equation
- Y-intercept
- Bivariate data
- Nonlinear relationship
- Function
- Input
- Linear function
- Output

Resources & Materials

- Textbook (Go Math Gr. 8)
- SMARTBoard
- Calculator
- Teacher-made materials

- Guided notes
- Online games
- www.khanacademy.org
- www.ixl.com/math/
- my.hrw.com (Go Math Resources)
- www.desmos.com
- http://nlvm.usu.edu/
- https://illuminations.nctm.org/

Technology Infusion

Teacher Technology:
- Google Classroom
- SMARTBoard
- Chromebook
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Student Technology:
- Google Classroom
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- Kahoot!

Activities:
- Students will use the Chromebooks to access Google Classroom and Google Apps for Education to write out explanations for how problems were solved or how math connects to real-life situations.
- Students will use the Chromebooks to access websites like Quizzizz and Kahoot! to practice and review the skills learned throughout the unit.
- www.prometheanworld.com
- www.explorelearning.com
- http://nlvm.usu.edu/

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

Interdisciplinary Integration

Activities:
- Students will practice using the unit vocabulary as they talk and write about the problems they are solving. Understanding the vocabulary will aid their understanding of the concepts covered in this unit.

Resources:
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Standard	Standard Description
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21st Century Life Skills

Activities:
- Students will work in groups to collaborate, at times taking leadership roles, to communicate project ideas to the whole class.

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

Careers

Activities:
- Students will discuss and then write detailed explanations utilizing appropriate mathematical vocabulary to explain their thought process for obtaining solutions to specific problems.

Standard	Standard Description
CRP4	Communicate clearly and effectively and with reason.

Common Core State Standards for Mathematical Practice: Bold all that apply	
MP #	Practice
1	Make sense of problems and persevere in solving them.
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Standards	
Standard #	Standard Description
8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
8.EE.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.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
8.F.2	Compare properties (e.g. rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line.

8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

Differentiation			
Special Education	English Language Learners (ELL)	Response to Intervention (RTI)	Enrichment
- Provide modifications & accommodations as listed in the student's IEP - Position student near helping peer or have quick access to teacher - Modify or reduce assignments/tasks - Reduce length of assignment for different mode of delivery - Increase one-to-one time - Prioritize tasks - Use graphic organizers - Use online resources for skill building - Provide teacher notes - Use collaborative grouping strategies such as small groups - NJDOE resources - http://www.state.nj.us/education/specialed/ - math manipulatives	- Provide text-to-speech - Use of translation dictionary or software - Provide graphic organizers - NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm - Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm	- Tiered interventions following RTI framework - Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/ - Interventional Central - http://www.interventioncentral.org/	- Process should be modified: higher order thinking skills, open-ended thinking, discovery - Utilize project-based learning for greater depth of knowledge - Utilize exploratory connections to higher grade concepts - Contents should be modified: real world problems, audiences, deadlines, evaluations, transformations - Learning environments should be modified: student-centered learning, independence, openness, complexity, groups varied - NJDOE resources - http://www.state.nj.us/education/aps/cccs/g_and_t_req.htm

**Califon Public School
Curriculum**

Subject: Mathematics	Grade: 8	Unit #: 3	Pacing: 7 weeks
Unit Title: Solving Equations and Systems of Equations			

OVERVIEW OF UNIT:

In the first part of this module, students will learn about how to solve equations with the variable on both sides and with rational number coefficients and constants. Then during the second part of this module, students will learn how to sole systems of two linear equations in two variables using graphing, elimination, and substitution; analyze special systems that have no solution or an infinite number of solutions; and represent real-world situations using systems of equations.

Unit References	
Big Ideas	Essential Questions
- Solving equations with the variable on both sides and with rational number coefficients and constants - Solving systems of equations by graphing, substitution, or elimination	- How can you represent and solve equations with the variables on both sides? - How can you solve equations with rational number coefficients and constants? - How do you use the distributive property to solve equations? - How can you give examples of equations with a given number of solutions? - How do you use substitution to solve a system of linear equations? - How do you solve a system of linear equations by adding or subtracting? - How do you solve a system of linear equations by multiplying? - How do you solve a system with no solutions or infinitely many solutions?

Objectives

- Students will be able to solve equations with variables on both sides of the equations.
- Students will be able to solve equations with rational number coefficients and constants.
- Students will be able to apply the distributive property to solve equations.
- Students will be able to identify when equations will have one, many, or no solution.
- Students will be able to select the appropriate strategy (substitution, elimination or multiplication) to solve a system of linear equations.
- Students will be able to identify when a system of equations will have no solution or infinitely many solutions.

Assessment

Formative Assessment:
- Homework assignments
- Quizzes
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Summative Assessment:
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Benchmark Assessment:
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Key Vocabulary

- Algebraic expression
- Coefficient
- Common denominator
- Constant
- Equation
- Integers
- Least common multiple
- Operations

- Linear equation
- Ordered pair
- Slope
- Slope-intercept form
- X-axis
- X-intercept
- Y-axis
- Y-intercept

● Solution ● Variable ● Distributive property	● Solution of a system of equations ● Systems of equations

Resources & Materials	
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Interdisciplinary Integration

Activities:
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21st Century Life Skills

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Careers

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Standards	
Standard #	Standard Description
8.EE.7	Solve linear equations in one variable.
8.EE.7.a	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.7.b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
8.EE.8	Analyze and solve pairs of simultaneous linear equations.
8.EE.8.a	Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
8.EE.8.b	Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.
8.EE.8.c	Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

Differentiation			
Special Education	English Language Learners (ELL)	Response to Intervention (RTI)	Enrichment
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**Califon Public School
Curriculum**

Subject: Mathematics	Grade: 8	Unit #: 4	Pacing: 6 weeks
Unit Title: Transformational Geometry			

OVERVIEW OF UNIT:

Students will start out using transformation geometry to represent properties of orientation and congruence of translations, reflections, and rotations in a coordinate plane. They will also use transformation geometry to represent the effect of translations, reflections, and rotations in a coordinate plane using an algebraic representation. Also, the students will use transformational geometry to compare and contrast the attributes of a shape and its dilation(s) on a coordinate plane, represent algebraically the effect of a scale factor applied to two-dimensional figures on a coordinate plane with the origin as the center of dilation, and explore how transformations can be used to obtain similar figures.

Unit References	
Big Ideas	Essential Questions
- Effects of transformations - Translations - Reflections - Rotations - Dilations - Transformations in the coordinate plane	- How do you describe the properties of translation, reflection, and rotation? - How do you describe the effect of translation, reflection, and rotation on the congruence and orientation of figures? - How do you describe the effect of a translation, rotation, or reflection on coordinates using an algebraic representation? - How can transformations be used to verify that two figures have the same shape and size? - How do you describe the properties of dilations? - How can you describe the effect of dilations on coordinates using an algebraic representation? - What is the connection between transformations and the orientation of similar figures?

Objectives

- Students will be able to describe the properties of translations, reflections, and rotations.

- Students will be able to distinguish the effect of a translation, reflection, or rotation on the congruence and orientation of a figure.

- Students will be able to calculate the effect of a translation, rotation, or reflection on coordinates using an algebraic representation.

- Students will be able to explain the transformations used to verify that two figures have the same shape and size.

- Students will be able to identify the properties of dilations.

- Students will be able to calculate the effect of a dilation on coordinates using an algebraic representation.

- Students will be able to generalize the connection between transformations and the orientation of similar figures.

Assessment

Formative Assessment:
- Homework assignments
- Quizzes
- Classwork
- Skill worksheets
- Class discussions

Summative Assessment:
- Module Test
- Unit Test
- Performance Task

Benchmark Assessment:
- Link It Benchmark Assessment

Alternative Assessment:
- Performance Task
- Modified Tests (independently developed by teacher)
- Projects

Key Vocabulary

- Coordinate plane
- Parallelogram
- Quadrilateral
- Rhombus

- Translation
- Quadrants
- Ratio
- Scale

● Trapezoid	● X-axis
● Center of rotation	● Y-axis
● Congruent	● Center of dilation
● Image	● Dilation
● Line of reflection	● Enlargement
● Preimage	● Reduction
● Reflection	● Scale factor
● Rotation	● Similar
● Transformation	

Resources & Materials

● Textbook (Go Math Gr. 8)	● www.khanacademy.org
● SMARTBoard	● www.ixl.com/math/
● Calculator	● my.hrw.com (Go Math Resources)
● Teacher-made materials	● www.desmos.com
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Technology Infusion

Teacher Technology:
- Google Classroom
- SMARTBoard
- Chromebook
- Google Apps for Education

Student Technology:
- Google Classroom

- Chromebook
- Google Apps for Education
- Quizzizz
- Kahoot!

Activities:
- Students will use the Chromebooks to access Google Classroom and Google Apps for Education to write out explanations for how problems were solved or how math connects to real-life situations.
- Students will use the Chromebooks to access websites like Quizzizz and Kahoot! to practice and review the skills learned throughout the unit.

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- www.mathplayground.com
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- www.teq.com
- www.itunesu.com
- www.brainpop.com
- www.prometheanworld.com
- www.explorelearning.com
- http://nlvm.usu.edu/

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

Interdisciplinary Integration

Activities:
- Students will practice using the unit vocabulary as they talk and write about the problems they are solving. Understanding the vocabulary will aid their understanding of the concepts covered in this unit.

Resources:
- Teacher Vision Cross Curricular Theme Map - https://www.teachervision.com/teaching-methods/curriculum-planning/7167.html
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- Promoting Literacy in all Subjects by Glencoe - http://www.glencoe.com/sec/teachingtoday/subject/promoting_literacy.phtml
- International Literacy Association Read Write Think - http://www.readwritethink.org/

Standard	Standard Description
ELA-Literacy.RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

21st Century Life Skills
Activities: ● Students will work in groups to collaborate, at times taking leadership roles, to communicate project ideas to the whole class.

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

Careers
Activities: ● Students will discuss and then write detailed explanations utilizing appropriate mathematical vocabulary to explain their thought process for obtaining solutions to specific problems.

Standard	Standard Description
CRP4	Communicate clearly and effectively and with reason.

Common Core State Standards for Mathematical Practice: Bold all that apply	
MP #	Practice
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.

Standards	
Standard #	**Standard Description**
8.G.1	Verify experimentally the properties of rotations, reflections, and translations:
8.G.1.a	Lines are transformed to lines, and line segments to line segments of the same length.
8.G.1.b	Angles are transformed to angles of the same measure.
8.G.1.c	Parallel lines are transformed to parallel lines.
8.G.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.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
8.G.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.

Differentiation			
Special Education	English Language Learners (ELL)	Response to Intervention (RTI)	Enrichment
- Provide modifications & accommodations as listed in the student's IEP - Position student near helping peer or have quick access to teacher - Modify or reduce assignments/tasks - Reduce length of assignment for different mode of delivery - Increase one-to-one time - Prioritize tasks - Use graphic organizers - Use online resources for skill building - Provide teacher notes - Use collaborative grouping strategies such as small groups - NJDOE resources - http://www.state.nj.us/education/specialed/ - Math manipulatives	- Provide text-to-speech - Use of translation dictionary or software - Provide graphic organizers - NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm - Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm	- Tiered interventions following RTI framework - Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/ - Interventional Central - http://www.interventioncentral.org/	- Process should be modified: higher order thinking skills, open-ended thinking, discovery - Utilize project-based learning for greater depth of knowledge - Utilize exploratory connections to higher grade concepts - Contents should be modified: real world problems, audiences, deadlines, evaluations, transformations - Learning environments should be modified: student-centered learning, independence, openness, complexity, groups varied - NJDOE resources - http://www.state.nj.us/education/aps/cccs/g_and_t_req.htm

**Califon Public School
Curriculum**

Subject: Mathematics	Grade: 8	Unit #: 5	Pacing: 6 weeks
Unit Title: Measurement Geometry			

OVERVIEW OF UNIT*:*

Students will represent and determine angle relationships with angles formed by parallel lines that are cut by a transversal, the sum of the measures of the angles of a triangle, and the similarity of triangles. Then students will use models and diagrams to explain the Pythagorean Theorem, use the Pythagorean Theorem and its converse to solve problems, and determine the distance between two points on a coordinate plane using the Pythagorean Theorem. Finally, students will represent and solve for the volumes of three-dimensional curved figures. They will describe the volume formula of a cylinder in terms of its base area and height and model the relationship between the volume of a cylinder and a cone having both congruent bases and height and connect that relationship to their volume formulas. Also, they will solve problems involving the volume of cylinders, cones, and spheres.

Unit References	
Big Ideas	Essential Questions
- Angle relationships of parallel lines and transversals - Sum of the measures of the angles of a triangle - Exterior angles of a triangle - Similarity of triangles - The Pythagorean Theorem and its converse - The Distance Formula - Volume of cylinders, cones, and spheres	- What can you conclude about the angles formed by parallel lines that are cut by a transversal? - What can you conclude about the measures of the angles of a triangle? - How can you determine that two triangles are similar? - How can you prove the Pythagorean Theorem and use it to solve problems? - How can you test the converse of the Pythagorean Theorem and use it to solve problems? - How can you use the Pythagorean Theorem to find the distance between two points on a coordinate plane? - How can you find the volume of a cylinder? - How can you find the volume of cone? - How can you find the volume of a sphere?

Objectives

- Students will be able to make conclusions about the angles formed by parallel lines cut by a transversal.

- Students will be able to make conclusions about the measures of the angles of a triangle.

- Students will be able to determine that two triangles are similar.

- Students will be able to use the principle of the Pythagorean Theorem to solve problems.

- Students will be able to apply the converse of the Pythagorean Theorem to solve problems.

- Students will be able to apply the Pythagorean Theorem to find the distance between two points on a coordinate plane.

- Students will be able to calculate the volume of a cylinder, cone, and sphere.

Assessment

Formative Assessment:
- Homework assignments
- Quizzes
- Classwork
- Skill worksheets
- Class discussions

Summative Assessment:
- Module Test
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- Performance Task

Benchmark Assessment:
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Alternative Assessment:
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- Projects

Key Vocabulary

- Acute angle
- Angle
- Congruent

- Square root
- X-coordinate
- Y-coordinate

- Parallel lines	- Hypotenuse
- Vertex	- Legs
- Alternate exterior angles	- Theorem
- Alternate interior angles	- Vertex
- Corresponding angles	- Base
- Exterior angle	- Circumference
- Interior angle	- Diameter
- Remote interior angle	- Height
- Same-side interior angle	- Length
- Similar	- Perimeter
- Transversal	- Radius
- Area	- Width
- Ordered pair	- Cone
- Right angle	- Cylinder
- Right triangle	- Sphere

Resources & Materials

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Activities:
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- www.prometheanworld.com
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Standard	Standard Description
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.

Interdisciplinary Integration

Activities:
- Students will practice using the unit vocabulary as they talk and write about the problems they are solving. Understanding the vocabulary will aid their understanding of the concepts covered in this unit.

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Standard	Standard Description
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Activities:
● Students will work in groups to collaborate, at times taking leadership roles, to communicate project ideas to the whole class.

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

Careers
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Standard	Standard Description
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6	**Attend to precision.**
7	**Look for and make use of structure.**
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Standards	
Standard #	Standard Description
8.EE.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.7	Solve linear equations in one variable.
8.EE.7.b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.
8.G.6	Explain a proof of the Pythagorean Theorem and its converse.
8.G.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.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Differentiation			
Special Education	English Language Learners (ELL)	Response to Intervention (RTI)	Enrichment
- Provide modifications & accommodations as listed in the student's IEP - Position student near helping peer or have quick access to teacher - Modify or reduce assignments/tasks - Reduce length of assignment for different mode of delivery - Increase one-to-one time - Prioritize tasks - Use graphic organizers - Use online resources for skill building - Provide teacher notes - Use collaborative grouping strategies such as small groups - NJDOE resources - http://www.state.nj.us/education/specialed/ - Math manipulatives	- Provide text-to-speech - Use of translation dictionary or software - Provide graphic organizers - NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm - Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm	- Tiered interventions following RTI framework - Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/ - Interventional Central - http://www.interventioncentral.org/	- Process should be modified: higher order thinking skills, open-ended thinking, discovery - Utilize project-based learning for greater depth of knowledge - Utilize exploratory connections to higher grade concepts - Contents should be modified: real world problems, audiences, deadlines, evaluations, transformations - Learning environments should be modified: student-centered learning, independence, openness, complexity, groups varied - NJDOE resources - http://www.state.nj.us/education/aps/cccs/g_and_t_req.htm

Califon Public School
Curriculum

Subject: Mathematics	Grade: 8	Unit #: 6	Pacing: 5 weeks
Unit Title: Statistics			

OVERVIEW OF UNIT:

Students will learn how to represent data in a scatter plot, describe associations in data in scatter plots, represent bivariate data in a scatter plot with a trend line, and make predictions from a scatter plot or trend line. In addition, students will learn how to create two-way frequency and relative frequency tables for categorical data, calculate joint, marginal, and conditional relative frequencies given a two-way relative frequency table, and analyze a two-way table to discover any association between the variables.

Unit References	
Big Ideas	Essential Questions
- Scatter plots and associations - Trend lines and predictions - Two-way frequency and relative frequency tables	- How can you construct and interpret scatter plots? - How can you use a trend line to make a prediction from a scatter plot? - How can you construct and interpret two-way frequency tables? - How can categorical data be organized and analyzed?

Objectives
- Students will be able to construct scatter plots and two-way frequency tables   - Students will be able to interpret scatter plots and two-way frequency tables   - Students will be able to make predictions from a scatter plot   - Students will be able to organize and analyze categorical data

Assessment

Formative Assessment:
- Homework assignments
- Quizzes
- Classwork
- Skill worksheets
- Class discussions

Summative Assessment:
- Module Test
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Key Vocabulary

- Bivariate data
- Data
- Linear equation
- Slope
- Slope-intercept form of an equation
- X-coordinate
- Y-coordinate
- Y-intercept
- Cluster
- Outlier
- Scatter plot
- Trend line
- Association

- Cluster
- Data
- Interpolation
- Extrapolation
- Outlier
- Scatter plot
- Conditional relative frequency
- Frequency
- Joint relative frequency
- Marginal relative frequency
- Relative frequency
- Two-way table
- Two-way relative frequency table

Resources & Materials	
● Textbook (Go Math Gr. 8) ● SMARTBoard ● Calculator ● Teacher-made materials ● Guided notes ● Online games	● www.khanacademy.org ● www.ixl.com/math/ ● my.hrw.com (Go Math Resources) ● www.desmos.com ● http://nlvm.usu.edu/ ● https://illuminations.nctm.org/

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

Interdisciplinary Integration

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

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Standards	
Standard #	Standard Description
8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line.
8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.
8.SP.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

Differentiation			
Special Education	English Language Learners (ELL)	Response to Intervention (RTI)	Enrichment
- Provide modifications & accommodations as listed in the student's IEP - Position student near helping peer or have quick access to teacher - Modify or reduce assignments/tasks - Reduce length of assignment for different mode of delivery - Increase one-to-one time - Prioritize tasks - Use graphic organizers - Use online resources for skill building - Provide teacher notes - Use collaborative grouping strategies such as small groups - NJDOE resources - http://www.state.nj.us/education/specialed/ - Math manipulatives	- Provide text-to-speech - Use of translation dictionary or software - Provide graphic organizers - NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm - Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm	- Tiered interventions following RTI framework - Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/ - Interventional Central - http://www.interventioncentral.org/	- Process should be modified: higher order thinking skills, open-ended thinking, discovery - Utilize project-based learning for greater depth of knowledge - Utilize exploratory connections to higher grade concepts - Contents should be modified: real world problems, audiences, deadlines, evaluations, transformations - Learning environments should be modified: student-centered learning, independence, openness, complexity, groups varied - NJDOE resources - http://www.state.nj.us/education/aps/cccs/g_and_t_req.htm