Math 8 Curriculum Map - Gregg - Rm 243

Unit 1 - Angles and Triangles

Title or Topics with NYS Standards	Materials and Major Assessments	Content Skills	Strategies/ Questions	Vocabulary	Time Frame
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. **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.	**Unit 1 Notes** Includes vocabulary, common misconceptions, cheat sheet and Study Guide Unit 1 Check Ins: Quiz 1 IXL Jam Sessions (whole class questions) **Unit 1 Test** *With common assessment questions aligned to NYS Math 8 Exam* *Notes and calculators allowed on all in class exams.* IXLcom for homework fluency, consistency and accuracy.	Lesson 1: Parallel Lines and Transversals Lesson 2: Applying Relationships Lesson 3: Interior Angles of Triangles Lesson 4: Exterior Angles of Triangles Lesson 5: Angles in Similar Triangles	**Strategies:** Use two colors to mark all congruent angles. Colors that are the same are congruent and can be set equal to each other when solving for a variable. **3x + 8 = 4x - 2** Colors that are different can be set or added to 180, because they are supplementary. **5x - 12 + 2x = 180** All three interior angles inside a triangle add up to 180 degrees. Triangle area formula is half of a rectangle, therefore the interior angles are also half the sum of a rectangle. Isosceles triangles have two sides that are the same, BUT also two angles that are the same too. Equilateral triangles have all 3 angles equal to 60 degrees. Similar figures share corres	Transversal Interior Angles Exterior Angles Interior Angles of a polygon Exterior Angles of a Polygon Complementary Supplementary Obtuse Acute RightTriangle Interior Sum Theorem Exterior SumTheorem Vertical Angles Adjacent Angles Alternate angles	September

Unit 2 - Rational Numbers					
Title or Topics with NYS Standards	**Materials and Major Assessments**	**Content Skills**	**Strategies/ Questions**	**Vocabulary**	**Time Frame**
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 **,** 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., π2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations*	**Unit 2 Notes** Includes vocabulary, common misconceptions, cheat sheet and Study Guide **Unit 2 Check Ins**: Quiz 1 IXL Jam Session (whole class questions) **Unit 2 Test** *With common assessment questions aligned to NYS Math 8 Exam* *Notes and calculators allowed on all in class exams.* IXLcom for homework fluency, consistency and accuracy.	Lesson 1: Fractions and Decimals Lesson 2: Squares and Square Roots Lesson 3: Estimating Square Roots Lesson 4: Rational vs. Irrational Numbers Lesson 5: Classifying Real Numbers Lesson 6: Comparing and Ordering Real Numbers	How can you convert between fractions and decimals? What are perfect squares? What makes it a perfect square? What's the difference between Rational and Irrational? What are all the classifications of numbers? How do you remember the order? How do you compare numbers that are in different forms? What steps in the calculator can you use to convert between fractions and decimals? **<u>Cal Help</u>**: Use A b/c button in between submitting numbers for fractions and mixed fractions. 2nd PRB = fraction <> decimal Using the **2nd** > **A b/c** button converts mixed numbers to improper fractions.	Convert Repeating Decimal Terminating Decimal Square Root Cube Root Perfect square Inverse operations Irrational Rational Integer Whole Number Natural Counting Number Greater than Less than Equal to Mixed Fraction Improper Fraction Place Values Pi Numerator Denominator	Early October

Unit 3 - Pythagorean Theorem

Title or Topics with NYS Standards	Materials and Major Assessments	Content Skills	Essential Questions	Vocabulary	Time Frame
CCSS.MATH.CONTENT.8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse. CCSS.MATH.CONTENT.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. CCSS.MATH.CONTENT.8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system	**Unit 3 Notes** Includes vocabulary, common misconceptions, cheat sheet and Study Guide **Unit 3 Check Ins**: Quiz 1 IXL Jam Session (whole class questions) **Unit 3 Test** *With common assessment questions aligned to NYS Math 8 Exam* *Notes and calculators allowed on all in class exams.* IXLcom for homework fluency, consistency and accuracy.	Lesson 1: The Pythagorean Theorem Lesson 2: Pythagorean Theorem Converse Lesson 3: Applying Pythagorean Theorem Lesson 4: Distance on the Coordinate Plane Lesson 5: 3D Application Theorem	What is the Pythagorean theorem used for? What type of triangle can you prove? What is a pythagorean theorem? When in real life is the Pythagorean theorem applicable? How do you find a diagonal distance on the coordinate plane using the Pythagorean Theorem? How do you find the diagonal of a 3D figure? **<u>Strategies</u>**: Be fluent with perfect squares Solving for the hypotenuse, add the legs, then square root your answer. Solving for the leg of a right triangle, subtract the leg from the hypotenuse, then square root your answer.	Leg Hypotenuse Converse Right Triangle Pythagorean Theorem Distance Coordinate plane Inverse operations Solving equations Pythagorean Converse Pythagorean triple Solve Proof	Late October

Unit 4: Volume

Title or Topics with NYS Standards	Materials and Major Assessments	Content Skills	Strategies/ Questions	Vocabulary	Time Frame
CCSS.MATH.CONTENT.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.	**Unit 4 Notes** Includes vocabulary, common misconceptions, cheat sheet and Study Guide **Unit 4 Check Ins**: Quiz 1 IXL Jam Session (whole class questions) **Unit 4 Test** *With common assessment questions aligned to NYS Math 8 Exam* *Notes and calculators allowed on all in class exams.* IXLcom for homework fluency, consistency and accuracy.	Lesson 1: Volume of Cylinder Lesson 2: Volume of Cones Lesson 3: Applying Volume of Cylinders and Cones Lesson 4: Volume of Spheres Lesson 5: Applying Volume of Spheres	How can you find the volume of a cylinder? How can you find the volume of a cone? How can you find the volume of a sphere? When the dimensions of a solid increases by a factor of k, how does the surface area change? How does the volume change? **Strategies/ Tips**: Use 3.14 only when the questions asks you to. Make sure you are squaring the radius for only cones and cylinder, cube it for spheres Use only the radius in the formula, not the diameter. To solve for radius, take the square root at the end of solving. Compound figures stacked, add volumes. Figures inverted subtract volumes.	Cylinder Sphere Cone Volume Cubed Cubic Units Pi In Terms of Pi Rounding Tenths Hundreths Height Radius Diameter Area Compound Figures Square root Cube root	November

Unit 5 - Transformations

Standards	Major Assessments	Content Skills	Essential Questions	Vocabulary	Time Frame
8.G.1 Verify experimentally the properties of rotations, reflections, and translations **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.	**Unit 5 Notes** Includes vocabulary, common misconceptions, cheat sheet and Study Guide **Unit 5 Check Ins**: Quiz 1 IXL Jam Session (whole class questions) **Unit 5 Test** *With common assessment questions aligned to NYS Math 8 Exam* *Notes and calculators allowed on all in class exams.* IXLcom for homework fluency, consistency and accuracy.	Lesson 1: Basics of Transformations Lesson 2: Translation on the Coordinate Plane Lesson 3: Reflection on the Coordinate Plane Lesson 4: Rotation of the Coordinate Plane Lesson 5: Identifying Transformations Lesson 6: Scale Factor and Dilation Lesson 7: Dilation on the Coordinate Plane Lesson 8: Properties of Transformations	What are the saying/ rules for each transformation? What are the synonyms for each transformation? What is a sequence of transformation? What does prime mean? What's the difference between the image and preimage? How do you find the original figure after a transformation given the new image? What properties are preserved after a rigid motion? Dilation? What is the difference between similar figures and congruent figures?	Congruent Figures Corresponding Angles Corresponding Sides Transformations Image Preimage (original figure) Translation Reflection Line of Reflection Rotation Center of Rotation Angle of Rotation Similar Figures Dilation Center of Dilation Scale Factor Mapping Prime Notation Ordered Pair Coordinate Coordinate Grid X Axis Y Axis	November-December

Unit 6 - Linear Equations

Standards	Major Assessments	Content Skills	Essential Questions	Vocabulary	Time Frame
8.EE.7 Solve linear equations in one variable. **NY-8.EE.7a** Recognize when linear equations in one variable have one solution, infinitely many solutions, or no solutions. Give examples and show which of these possibilities is the case by successively transforming the given equation into simpler forms. **8.EE.7b** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	**Unit 6 Notes** Includes vocabulary, common misconceptions, cheat sheet and Study Guide **Unit 6 Check Ins**: Quiz 1 IXL Jam Session (whole class questions) **Unit 6 Test** *With common assessment questions aligned to NYS Math 8 Exam* *Notes and calculators allowed on all in class exams.* IXLcom for homework fluency, consistency and accuracy.	Lesson 1: Simplifying Expressions Lesson 2: Simplifying Expressions with Distributive Property Lesson 3: One and Two-Step Equations Lesson 4: Multi-step Equations Lesson 5: Multistep Equations with Distributive Property Lesson 6: Equations with Variables on Both sides Lesson 7: Writing Equations with Variables on Both Sides Lesson 8: Equations with Special Cases	How can you recognize a linear equation? How can you draw its graph? How can you use the slope of a line to describe the line? How can you use an equation to identify parallel and perpendicular lines? How can you describe the graph of the equation y=mx+b? How can you describe the graph of the equation ax + by = c? How can you write an equation of a line when you are given the slope and the y-intercept of the line? How can you write an equation of a line when you are given the slope and a point on the line?	Linear Equation Solution of a Linear Equation Slope Rise Run X-intercept Y-intercept Slope-intercept form Standard Form Point-slope form DCMAM Inverse Solution Varisable Expression Equation Simplify Check	January

Unit 7 - Linear Relationships					
Standards	**Major Assessments**	**Content Skills**	**Essential Questions**	**Vocabulary**	**Time Frame**
CCSS.MATH.CONTENT.8.EE.B.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. **CCSS.MATH.CONTENT.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*.**	**Unit 7 Notes** Includes vocabulary, common misconceptions, cheat sheet and Study Guide **Unit 7 Check Ins**: Quiz 1 IXL Jam Session (whole class questions) **Unit 7 Test** *With common assessment questions aligned to NYS Math 8 Exam* *Notes and calculators allowed on all in class exams.* IXLcom for homework fluency, consistency and accuracy.	Lesson 1:Slope and Rate of Change Lesson 2: Slope Formula Lesson 3: Slope Intercept Form: Part I Lesson 4: Slope Intercept Form: Part II Lesson 5: Multiple Representations Lesson 6: Proportional and Non-Proportional Relationships	What is slope and how do you find it from an equation? Table? Graph? What is the y-intercept? X-intercept? How is it written as a coordinate? How is it found in an equation graph and table? What is slope intercept form? What are each of the parts? How can I remember this? What does it mean to compare rates of change? Y-intercepts? What is the difference between proportional and nonproportional? Why is the rate of change y divided by x? How can I remember this?	Slope Rate of change Y-intercept Initial value Rate Y axis X axis Origin Y coordinate X coordinate Rise over run DIXI ROYD Slope intercept form y=mx+b Positive slope Negative slope Zero slope Undefined Slope Table Y over X Equation Graph	February

Unit 8 - Functions

Standards	Major Assessments	Content Skills	Essential Questions	Vocabulary	Time Frame
CCSS.MATH.CONTENT.8.F.A.1 **Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.1** **CCSS.MATH.CONTENT.8.F.A.2** **Compare properties 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.*** **CCSS.MATH.CONTENT.8.F.A.3** **Interpret the equation *y = mx + b* as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function A = s^2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*** **Unit 8 Notes** Includes vocabulary, common misconceptions, cheat sheet and Study Guide **Unit 8 Check Ins**: Quiz 1 IXL Jam Session (whole class questions) **Unit 8 Test** *With common assessment questions aligned to NYS Math 8 Exam* *Notes and calculators allowed on all in class exams.* IXLcom for homework fluency, consistency and accuracy.	**Lesson 1**: Identifying Functions **Lesson 2**: Linear vs Nonlinear Functions **Lesson 3**: Writing Equations of Linear Functions **Lesson 4**: Applying Linear Functions **Lesson 5:** Analyzing Functions and Graphs	How can you identify a function in a table, graph, equation or ordered pair set? How can you identify a linear function from a table, graph, equation. What form is a linear equation written in? How do you find slope from a table? Graph? Equation? How do you find the y-intercept from a table? Graph? Equation?	Functions DIXI Domain Input X Coordinate Independent Variable ROYD Range Output Y Coordinate Domain Vertical Line Test Linear Nonlinear Solution(s) types y=mx+b Slope Y-intercept Rise over Run Positive/ Negative/ Zero Slope Undefined Slope	March

Unit 9: Data Analysis (Scatter Plots and Frequency Tables)

Standards	Major Assessments	Content Skills	Essential Questions	Vocabulary	Time Frame
CCSS.MATH.CONTENT.8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. CCSS.MATH.CONTENT.8.SP.A.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 by judging the closeness of the data points to the line. CCSS.MATH.CONTENT.8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. 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.	**Unit 9 Notes** Includes vocabulary, common misconceptions, cheat sheet and Study Guide **Unit 9 Check Ins**: Quiz 1 IXL Jam Session (whole class questions) **Unit 9 Test** *With common assessment questions aligned to NYS Math 8 Exam* *Notes and calculators allowed on all in class exams.* IXLcom for homework fluency, consistency and accuracy.	**Lesson 1:** Scatterplots and Associations Lesson 2: Constructing Scatter Plots Lesson 3: Scatter Plots and Predictions Lesson 4: Trend Line Equations Lesson 5: Two-Way Tables Lesson 6 Relative Frequency	What is a scatter plot and what does the data represent? What is a cluster? Outlier/ What does this mean according to the data? What is a correlation? What types of correlations are there? What is a trend line? How can we use this to predict future data? What is two way/ relative frequency? How is it used?	Scatterplot Coordinate Grid Correlation Relationship Outlier Cluster Line of Best Fit Trend Line Predict Data Data Table Frequency Frequency Table Two-way Table Analyze	April

Unit 10: Systems of Equations

Standards	Major Assessments	Content Skills	Essential Questions	Vocabulary	Time Frame
CCSS.MATH.CONTENT.8.EE.C.8 Analyze and solve pairs of simultaneous linear equations. CCSS.MATH.CONTENT.8.EE.C.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. CCSS.MATH.CONTENT.8.EE.C.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,*. CCSS.MATH.CONTENT.8.EE.C.8.C Solve real-world and mathematical problems leading to two linear equations in two variables.	**Unit 10 Notes** Includes vocabulary, common misconceptions, cheat sheet and Study Guide **Unit 10 Check Ins**: Quiz 1 IXL Jam Session (whole class questions) **Unit 10 Test** *With common assessment questions aligned to NYS Math 8 Exam* *Notes and calculators allowed on all in class exams.* IXLcom for homework fluency, consistency and accuracy.	**Lesson 1: I**ntro to Systems **Lesson 2:** Solving Systems by Graphing **Lesson 3:** Solving Systems by Substitution part 1 **Lesson 4**: Solving Systems by Substitution Part II Lesson 5: Solving Systems by Equations **Lesson 5**: Solving Systems by Inspection **Lesson 6**: Applying Systems of Equations	What is a solution to a system of equations? What types of solutions are there? How do you find a solution from graphing? Substitution? Elimination methods? When do you use each method? How can you identify a solution before even solving or graphing? What does no solution look like? What do infinite solutions mean and look like? Tips/ Strategies Same Slope & Intercept = infinite solutions Same Slope, different intercept = no solution Different slope, intercept = one solution.	Standard form Slope intercept form Slope Y-intercept Graphing method Substitution method Elimination Method Distributive property Variable terms Solution Solution Type Rate of Change	May

Unit 11: Exponents and Scientific Notation

Standards	Major Assessments	Content Skills	Essential Questions	Vocabulary	Time Frame
CCSS.MATH.CONTENT.8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$. CCSS.MATH.CONTENT.8.EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. CCSS.MATH.CONTENT.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. CCSS.MATH.CONTENT.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	**Unit 11 Notes** Includes vocabulary, common misconceptions, cheat sheet and Study Guide **Unit 11 Check Ins**: Quiz 1 IXL Jam Session (whole class questions) **Unit 11 Test** *With common assessment questions aligned to NYS Math 8 Exam* *Notes and calculators allowed on all in class exams.* IXLcom for homework fluency, consistency and accuracy.	**Lesson 1:** Square and Square Roots **Lesson 2:** Properties of Exponents **Lesson 3:** Properties of Negative and Zero Exponents **Lesson 4:** Scientific Notation **Lesson 5:** Adding and Subtracting Scientific Notation **Lesson 6:** Multiplying and Dividing Scientific Notation	Why are squaring and square roots inverses? What is the product to power? Quotient to Power? Power to Power? What happens if there is a negative exponent? If any number is raised to the power of zero, what is it? What is the rule and format for scientific notation? How do you perform operations in scientific notation?	Square Square Root Base Exponent Parentheses Power to Power Quotient to Power Product to Power Negative Keep Change Flip Leading Coefficient Power of 10 Place Values Scientific Notation Standard Form Convert	May