## Georgia Standards of Excellence: Curriculum Map

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### Expressions and Equations
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### Functions and Linear Functions
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### Linear Functions and Models Scatter Plots
- **MGSE.8.EE.5**
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- **MGSE.8.SP.4**

### Show What We Know
- ***EOG Review**
- **9th Grade Unit 1**

### Incorporated Standards

These units were written to build upon concepts from prior units, so later units contain tasks that depend upon the concepts addressed in earlier units.

All units will include the Mathematical Practices and indicate skills to maintain.

### Notes

*Revised 5/22/19*

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**NOTE:** Mathematical standards are interwoven and should be addressed throughout the year in as many different units and tasks as possible in order to stress the natural connections that exist among mathematical topics.
<table>
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<th>Standards for Mathematical Practice</th>
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<tr>
<td>1 Make sense of problems and persevere in solving them.</td>
<td>Equations 1  Work with radicals and integer exponents. MGSE.8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. MGSE.8.EE.2 Use square root and cube root symbols to represent solutions to equations. Recognize that $x^2 = p$ (where $p$ is positive rational number and $</td>
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<tr>
<td>2 Reason abstractly and quantitatively.</td>
<td>Rational Irrational</td>
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<tr>
<td>3 Construct viable arguments and critique the reasoning of others.</td>
<td>Geometric Applications of Exponents</td>
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<td>4 Model with mathematics.</td>
<td>Translations, Congruence and Similarity</td>
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*Revised 5/22/19
Know that there are numbers that are not rational, and approximate them by rational numbers.
MGSE.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. MGSE.8.NS.2 Use rational approximation of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line, and estimate the value of expressions (e.g. 
\[ \sqrt{2} \] between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.

MGSE.9-12.A.REI.1 Using algebraic properties and the properties of real numbers, justify the steps of a simple, one solution equation. Students should justify their own steps, or if given two or more steps of an equation, explain the progression from one step to the next using properties.
MGSE.9-12.A.REI.3 Solve linear equations and inequalities in one variable including equations with coefficients represented by letters.
\[ ax + 3 = 7, \text{solve for } x. \]

MGSE.9-12.N.RN.2 Rewrite expressions involving radicals.
MGSE.9-12.N.RN.3 Explain why the sum or product of rational numbers is rational; why the sum of a rational number and irrational number is irrational; and why the product of a nonzero rational number and an irrational number is irrational.

MGSE.9-12.G.SRT.4 Prove theorems about triangles. Theorem include: a line parallel to one side of a triangle divides the other two proportionally, (and its converse); the Pythagorean Theorem using triangle similarity.

S8P1 Obtain, evaluate and communicate information about the structure and properties of matter.

(Density equations)

S8P2 Obtain, evaluate and communicate information about the law of conservation of energy to develop arguments that energy can transform from one form to another within a system.

(Speed and Velocity equations)

S8P3 Obtain, evaluate and communicate information about cause and effect relationships between force, mass and the motion of objects.

(Balanced equations - no solution and...
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<th>Incorporate Standards</th>
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*Revised 5/22/19*
### Georgia Standards of Excellence: Eighth Grade

#### Unit 5: Functions and Linear Functions

**Define, evaluate and compare functions.**
- MGSE.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.
- MGSE.8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
- MGSE.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 $A = s^2$ 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.

**Understand the connections between proportional relationships, lines, and linear equations.**
- MGSE.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.
- MGSE.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 $y = mx + b$.

### Unit 6: Linear Functions and Models, Scatter Plots

**Use functions to model relationships between quantities.**
- MGSE.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 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.
- MGSE.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.

### Unit 7: Linear Systems of Equations

**Analyze and solve linear equations and pairs of simultaneous linear equations.**
- MGSE.8.EE.8 Analyze and solve pairs of simultaneous linear equations (systems of linear equations).
  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.
  b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.
  c. Solve real-world and mathematical problems leading to two linear equations in two variables.

### Unit 8: Two-Way Tables

**Investigate patterns of association in bivariate data.**
- MGSE.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.
  a. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects.
  b. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collected 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?

### Unit 9: Show what we know

*EOG Review 9th Grade Algebra I Unit I Basics*

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$y = mx + b$ for a line intercepting the vertical axis at $b$.

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.

MGSE.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.

**Incorporated Standards**

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<td>Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.</td>
<td>Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.</td>
<td>Interpret the slope and the intercept of a linear model in the context of the data.</td>
<td>Show and explain why the elimination method works to solve a system of two variable equations.</td>
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**Revised** 5/22/19