Math 8 I CAN Statements

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Unit 1 objectives:

- I can identify and distinguish rational and irrational numbers – particularly by looking at their decimal expansion
- I can approximate irrational numbers using rational numbers
- I can state and apply the Pythagorean Theorem
- I can use the Pythagorean Theorem to solve real-world problems – including areas and distances

Daily Objectives:

- I can identify, compare, and order rational and irrational numbers and convert between them
- I can show that rational numbers have a decimal expansion that repeats eventually, and convert repeating decimal expansions into rational numbers
- I can place irrational numbers on a number line and use approximations of irrational numbers to estimate the value of expressions
- I can recognize the square root and cube root symbols and evaluate perfect square and cube roots
- I can use the area of squares to prove the Pythagorean Theorem
- I can explain a proof of the Pythagorean theorem
- I can apply the Pythagorean Theorem to find unknown side lengths in a right triangle
- I can solve real-world problems using the Pythagorean Theorem
- I can find the distance between two points in a coordinate system using the Pythagorean Theorem

Unit 2 objectives:

- I can solve multi-step equations with rational numbers
- I can solve linear equations with one, no, or infinite solutions

Daily Objectives:

- I can solve one- and two-step equations
- I can apply the distributive property
- I can solve multi-step equations by distributing and combining like terms
- I can solve any multi-step linear equations (including problems with a variable on both sides of the equation)
- I can identify linear equations with no solutions or infinite solutions

Unit 3 Objectives:

- I can use and apply the properties of exponents and perform operations on them
- I can write numbers in scientific notation and standard notation
- I can perform operations with scientific notation

Daily Objectives:

- I can use the multiplication property of exponents to simplify expressions
- I can use the multiplication property of exponents to simplify expressions containing powers of powers
- I can use the division property of exponents to simplify expressions
- I can convert very large and very small numbers from standard notation to scientific notation
- I can convert numbers from scientific notations to standard notation
- I can perform operations on numbers in scientific notation – including problems where both decimal and scientific notation are used

Unit 4 Objectives:

(First review how to graph ordered pairs on a coordinate plane)

- I can explain the concept of a function
- I can interpret unit rate as slope and explain slope using similar triangles
- I can graph and compare linear relationships
- I can write, describe, and graph equations in the form y=mx+b from points, tables, graphs, and situations
- I can construct a function given a real-world situation by computing the rate of change and identifying the y-intercept
- I can distinguish between linear and non-linear equations given a function in any form

Daily Objectives:

- I can explain that a function has exactly one output for every distinct input
- I can recognize functions based on their graphs; I can graph ordered pairs
- I can describe different functions based on what happens to the output of a function as I increase or decrease the input (i.e. does the function increase or decrease)
- I can recognize slope intercept form as y=mx+b, and know that every linear function can be written in this form
- I can graph linear functions given in the form y=mx+b
- I can write functions in the form y=mx+b based on the graph of the function
- I can calculate slope using slope formula ($m = \frac{y2-y1}{x2-x1}$) given two points (x,y)
- I can construct a function rule given a table of values or a graph
- I can interpret rate of change and initial value of a linear function in terms of a situation
- I can distinguish between linear and non-linear equations

- I can explain a function based on the graph in terms of the situation that is occurring as the input values increase or decrease
- I can construct a function from a real-world situation

Unit 5 Objectives:

- I can interpret unit rate as the slope of a graph (graph proportional relationships)
- I can understand that linear functions are proportional relationships
- I can compare two different proportional relationships represented in different ways

Daily Objectives:

- I can use a table of values of a function to identify the proportional relationship (slope) of a function
- I can explain the rate of change of a linear function in terms of the proportional relationship of the situation
- I can explain why linear functions always have proportional relationships between the input and the output
- I can compare two different proportional relationships that are represented in different ways and compare/contrast them

Unit 6 Objectives:

- I can understand that the solution to a system of (2) equations is the point (x,y) that satisfies both equations in the system at the same time
- I can use any method (graphing, elimination, or substitution) to solve a system of equations
- I can solve real-world systems of equations
- I can explain why a system of equations must have as many equations as there are unknown variables, or it is unsolvable.

Daily Objectives:

- I can solve a system of equations by graphing the system and finding the point of intersection (which is the solution)
- I can estimate solutions by graphing the equations
- I can solve a system of equations using elimination to solve for each variable to find the (x,y) solution (2 days)
- I can solve a system of equations by substituting equivalent expressions (2 days)
- I can solve a system of equations by inspection (in simple cases) – example: $3x+2y=5$ and $3x+2y=6$ has no solution because no x and y values can satisfy both equations simultaneously
- I can solve real-world systems by setting up two equations (with 2 variables) and solving for the solution using any method

Unit 7 Objectives:

- I can perform transformations using properties of reflections, rotations, translations, and dilations
- I can describe the effects of rotations, reflections, translations, and dilations using coordinate notation
- I can explain congruence with reflections, rotations, and translations
- I can explain similarity as a result of a combination of rotations, reflections, translations, and dilations

Daily Objectives

- I can perform a reflection on a coordinate plane given points and a reflection line
- I can perform a rotation on a coordinate plane given points and the degree of rotation
- I can perform a translation on a coordinate plane given points and coordinate directions
- I can verify the 3 properties of reflections, rotations, and translations (experimentally)
- I can define congruence and explain how to obtain one figure from another by a sequence of reflections, rotations, and translations
- I can perform a dilation on a figure in a coordinate plane given a scale factor (I can explain that dilated figures are proportional in size to the original figure
- I can define similarity and describe a sequence of transformations between two similar figures
- I can describe sequences from one similar or congruent figure to another using coordinate notation and directions

Unit 8 Objectives:

- I can use properties of the angle sum and interior angles of a triangle
- I can explain and apply the angle-angle criterion for similar triangles
- I can use properties about angles formed by transversals and parallel lines

Daily Objectives:

- I can use properties of interior angles or triangles to solve problems
- I can find interior and/or exterior angles of a triangle given two angles of the triangle
- I can use the angle-angle criterion to determine if two triangles are similar
- I can use parallel lines and transversals to determine similar angles
- I can use angle properties to determine every angle created by a transversal through parallel lines

Unit 9 Objectives:

- I can construct and interpret scatter plots
- I can use a trend line and its resulting equation to describe data in a scatter plot
- I can describe and interpret graphs using rate of change and the initial value
- I can collect categorical data and create two-way tables to analyze it
- I can create box-and-whisker plots using mean, median, mode, and outliers based on given data
- I can explain how much data is in each quartile of a box and whisker plot
- I can use mathematical vocabulary to talk about and analyze data, and to organize it into different representations (box and whisker, scatter plot, etc.)

Daily Objectives:

- I can label axes and graph data given in a table on a scatter plot
- I can construct a trend line based on the data that is graphed
- I can form an equation that represents the data and trend line
- I can describe the correlation shown on a scatter plot and explain what that means in terms of the data
- I can collect my own data, graph it, create a line and an equation to represent it, and analyze what the data tells me

- I can use the mean, median, mode, and outliers to create a box-and-whisker plot
- I can calculate the quartiles of data and explain what it means for data to be in a specific quartile
- I can use mathematical vocabulary to talk about and analyze data