Content Area	Mathematics		**Grade Level**	8th Grade
Course Name/Course Code				

Standard	**Grade Level Expectations (GLE)**		**GLE Code**
1. Number Sense, Properties, and Operations	1.	In the real number system, rational and irrational numbers are in one to one correspondence to points on the number line	MA10-GR.8-S.1-GLE.1
2. Patterns, Functions, and Algebraic Structures	1.	Linear functions model situations with a constant rate of change and can be represented numerically, algebraically, and graphically	MA10-GR.8-S.2-GLE.1
	2.	Properties of algebra and equality are used to solve linear equations and systems of equations	MA10-GR.8-S.2-GLE.2
	3.	Graphs, tables and equations can be used to distinguish between linear and nonlinear functions	MA10-GR.8-S.2-GLE.3
3. Data Analysis, Statistics, and Probability	1.	Visual displays and summary statistics of two-variable data condense the information in data sets into usable knowledge	MA10-GR.8-S.3-GLE.1
4. Shape, Dimension, and Geometric Relationships	1.	Transformations of objects can be used to define the concepts of congruence and similarity	MA10-GR.8-S.4-GLE.1
	2.	Direct and indirect measurement can be used to describe and make comparisons	MA10-GR.8-S.4-GLE.2

Colorado 21st Century Skills
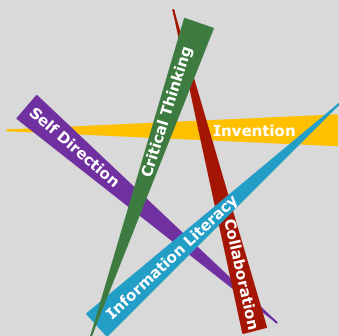
Critical Thinking and Reasoning: *Thinking Deeply, Thinking Differently*

Information Literacy: *Untangling the Web*

Collaboration: *Working Together, Learning Together*

Self-Direction: *Own Your Learning*

Invention: *Creating Solutions*

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.

Unit Titles	Length of Unit/Contact Hours	Unit Number/Sequence
Power Trip	2 weeks	1
It's All Greek to Me	5 weeks	2
Moving Mathematically	5 weeks	3
Walk the Line	6 weeks	4
Whose Line is It?	5 weeks	5
Frequently Scatter Brained	3 weeks	6

Unit Title	Power Trip			Length of Unit	2 weeks
Focusing Lens(es)	Efficiency Flexibility	**Standards and Grade Level Expectations Addressed in this Unit**	MA10-GR.8-S.1-GLE.1		
Inquiry Questions (Engaging-Debatable):	• How would scientific notation look in a non-base 10 system? (MA10-GR.8-S.1-GLE.1)				
Unit Strands	Expressions and Equations				
Concepts	Properties of integer exponents, equivalent expressions, comparison, scientific notation, quantities				

Generalizations My students will **Understand** that…	Guiding Questions	
	Factual	**Conceptual**
Properties of integer exponents can generate equivalent expressions to allow for easier comparisons of quantities (MA10-GR.8-S.1-GLE.1-EO.d)	What are the properties of exponents? How can properties of exponents create equivalent expressions? How does rewriting a quantity using the properties of exponents help to compare numbers?	When the distance between two quantities is relatively large, why is it important to compare them multiplicatively?
Scientific notation expedites calculations of very large and very small quantities (MA10-GR.8-S.1-GLE.1-EO.g, h.i, h.ii)	How do you write a number in scientific notation? How do you compare, multiply, and divide numbers written in scientific notation?	How does scientific notation expedite the mathematical processes of calculation and comparison? Why does the common base of 10 in scientific notation facilitate comparing and calculating quantities?

Key Knowledge and Skills: My students will…	*What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.*

- Know and apply the properties of integer exponents to generate equivalent numerical expressions (MA10-GR.8-S.1-GLE.1-EO.hi)
- 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 (MA10-GR.8-S.1-GLE.1-EO.d)
- Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used (MA10-GR.8-S.1-GLE.1-EO.h)
- Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (MA10-GR.8-S.1-GLE.1-EO.h.i)
- Interpret scientific notation that has been generated by technology (MA10-GR.8-S.1-GLE.1-EO.h.ii)

Critical Language: includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline.
EXAMPLE: A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: *"Mark Twain exposes the hypocrisy of slavery through the use of satire."*

A student in _____ can demonstrate the ability to apply and comprehend critical language through the following statement(s):	*Scientific Notation uses place value and powers of 10 to write very large and very small numbers.* *Properties of Exponents allow us to generate equivalent expressions.*
Academic Vocabulary:	compare, estimate, apply, generate, perform,
Technical Vocabulary:	Exponents, base, expressions, place value, integer, power of 10, properties of integer exponents, equivalent expressions, comparison, scientific notation, quantities, raise (to the power), power

Unit Title	It's All Greek to Me			Length of Unit	5 weeks
Focusing Lens(es)	Connections		Standards and Grade Level Expectations Addressed in this Unit	MA10-GR.8-S.1-GLE.1 MA10-GR.8-S.4-GLE.2	
Inquiry Questions (Engaging-Debatable):	• How has technology changed our concept of number? (MA10-GR.8-S.1-GLE.1)				
Unit Strands	The Number System, Expressions and Equations, Geometry				
Concepts	Pythagorean Theorem, right triangle, indirect measurement, rational numbers, irrational numbers, division, integers, terminate, repeat, decimals, approximation, representation, number line				

Generalizations My students will **Understand** that…	Guiding Questions	
	Factual	**Conceptual**
The Pythagorean Theorem communicates the relationship among the sides of a right triangle. (MA10-GR.8-S.4-GLE.2-EO.a)	What is the Pythagorean Theorem? How can you use the Pythagorean Theorem to prove that a triangle is a right triangle?	Why does the Pythagorean Theorem only apply to right triangles? (MA10-GR.8-S.4-GLE.2-IQ.1) How can you prove the Pythagorean Theorem and its converse?
The Pythagorean Theorem facilitates indirectly finding the lengths of measurements of right triangles. (MA10-GR.8-S.4-GLE.2-EO.b, c) and (MA10-GR.8-S.1-GLE.1-EO.e, f)	How can you use the Pythagorean Theorem to find unknown side lengths in a right triangle? How can the Pythagorean Theorem be used for indirect measurement? (MA10-GR.8-S.4-GLE.2-IQ.2) How can you apply the Pythagorean Theorem to determine the distance between two points on the coordinate system?	Why are the Pythagorean Theorem and the distance formula equivalent equations of the same relationship? (MA10-GR.8-S.4-GLE.2-IQ.3) Why is solving square root and cube root equations similar and different to solving linear equations?
Rational numbers, written as the division of two integers, result in a terminating or repeating decimal (MA10-GR.8-S.1-GLE.1-EO.b.i, b.ii))	What are examples of two integers whose quotient results in a terminating decimal? What are examples of two integers whose quotient results in a repeating decimal? How can you determine if the decimal expansion of a rational number will terminate or repeat?	Why do rational numbers create terminating or repeating decimals? Why does 1/3 repeat in a base ten decimal system but not in a base 60?

Irrational numbers, which cannot be written as the division of two integers, require a decimal approximation for representation on a number line (MA10-GR.8-S.1-GLE.1-EO.a, c)	What are some examples of irrational numbers? What is the difference between rational and irrational numbers? (MA10-GR.8-S.1-GLE.1-IQ.3)	Why are irrational numbers unable to be written as a division of two integers? Why is the square root of two an irrational number?

Key Knowledge and Skills: **My students will…**	*What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.*

- Know that numbers that are not rational are called irrational (MA10-GR.8-S.1-GLE.1-EO.a)
- Understand informally that every number has a decimal expansion (MA10-GR.8-S.1-GLE.1-EO.b)
- Show that for rational numbers the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number (MA10-GR.8-S.1-GLE.1-EO.b.i, b.ii)
- 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 (MA10-GR.8-S.1-GLE.1-EO.c)
- 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 (MA10-GR.8-S.1-GLE.1-EO.e)
- Evaluate square roots of small perfect squares and cube roots of small perfect cubes (MA10-GR.8-S.1-GLE.1-EO.f)
- Explain a proof of the Pythagorean Theorem and its converse (MA10-GR.8-S.4-GLE.2-EO.a)
- Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions (MA10-GR.8-S.4-GLE.2-EO.b)
- Apply the Pythagorean Theorem to find the distance between two points in a coordinate system (MA10-GR.8-S.4-GLE.2-EO.c)

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A student in _____ can demonstrate the ability to apply and comprehend critical language through the following statement(s):	*I can use the Pythagorean Theorem to determine the missing side lengths of a right triangle and calculate distances on a coordinate plane.* *I know one-seventh is a rational number because it is the division of two integers even though my calculator does not show how it repeats as a decimal.*
Academic Vocabulary:	Locate, unknown, compare, estimate, apply, explain, proof, prove, convert, distance, representation,
Technical Vocabulary:	Pythagorean Theorem, leg, hypotenuse, right angle, integer, converse, right triangle, indirect measurement, rational numbers, irrational numbers, division, integers, terminate, repeat, decimals, approximation, number line, square root, cube root, perfect square, perfect cube, decimal expansion, coordinate system

Unit Title	Moving Mathematically			Length of Unit	5 weeks
Focusing Lens(es)	Identity		**Standards and Grade Level Expectations Addressed in this Unit**	MA10-GR.8-S.4-GLE.1 MA10-GR.8-S.4-GLE.2	
Inquiry Questions (Engaging-Debatable):	• How do video game programmers use transformations in their work? (MA10-GR.8-S.4-GLE.2) • How can a container's shape affect its maximum volume?				
Unit Strands	Geometry				
Concepts	Volume, formulas, cones, cylinders, spheres, transversal, parallel lines, angles, relationships, rotations, reflections, translations, congruence, dilations, similarity, coordinates, symbolically, algebraic				

Generalizations My students will **Understand** that…	Guiding Questions	
	Factual	**Conceptual**
Formulas for the volume of cones, cylinders, and spheres represent algebraic descriptions of a shape and quantify the space inside (MA10-GR.8-S.4-GLE.2-EO.d)	What is the formula of volume of a cone? What is the formula of volume of a cylinder? What is the formula of volume of a sphere?	How are the volume formulas for cones, cylinders, and sphere interrelated? (MA10-GR.8-S.4-GLE.2-IQ.4)
Transversals intersect parallel lines to create various known angle relationships (MA10-GR.8-S.4-GLE.1-EO.g)	What are the names of the angle relationships formed when a transversal intersects two parallel lines? How can a transversal intersecting two parallel lines informally show that the sum of the interior angles of a triangle is 180 degrees?	How do the angle relationships formed when a transversal intersects parallel lines provide a method for indirectly determining the measure of unknown angles? How could you use a transversal and angle measurements to determine if two lines are parallel? (MA10-GR.8-S.4-GLE.1-IQ.2)
A sequence of rotations, reflections and translations determines the congruence of two shapes. (MA10-GR.8-S.4-GLE.1-EO.a, c)	How can you use a sequence of transformations to determine that two shapes are equivalent?	Why are rotations, reflections and translations called rigid transformations?
A sequence of dilations, rotations, reflections and translations determines the similarity of two shapes. (MA10-GR.8-S.4-GLE.1-EO.e, f, g)	How can you determine if a dilation will enlarge or shrink a picture? What are properties of similar figures? When determining if two triangles are similar is it sufficient to compare complementary angles?	Why are angles of similar figures congruent? Why is a dilation not a rigid transformation?

Coordinates can represent symbolically the effects of dilations, translations, rotations and reflections on two-dimensional figures. (MA10-GR.8-S.4-GLE.1-EO.b)	What patterns in the coordinates of a point do you notice when you dilate, reflect, rotate or translate a point?	Why is it helpful to represent transformations performed on a coordinate grid symbolically? (MA10-GR.8-S.4-GLE.1-IQ.1)

Key Knowledge and Skills: **My students will…**	*What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.*

- Verify experimentally the properties of rotations, reflections, and translations (e.g., line segments are taken to line segments of the same length, angles to angles of the same measure) (MA10-GR.8-S.4-GLE.1-EO.a)
- Understand 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 (MA10-GR.8-S.4-GLE.1-EO.c)
- Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them (MA10-GR.8-S.4-GLE.1-EO.d)
- Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates (MA10-GR.8-S.4-GLE.1-EO.b)
- Understand 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 (MA10-GR.8-S.4-GLE.1-EO.e)
- Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them (MA10-GR.8-S.4-GLE.1-EO.)
- Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines arfe cut by a transversal, and the angle-angle criterion for similarity of triangles (MA10-GR.8-S.4-GLE.1-EO.g)
- Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems (MA10-GR.8-S.4-GLE.2-EO.d)

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A student in _____ can demonstrate the ability to apply and comprehend critical language through the following statement(s):	*Rotations, reflections, and translations are transformations that create congruent figures.* *A dilation is a transformation that creates similar figures.*
Academic Vocabulary:	describe, verify, experimentally, represent, describe, solve, triangle, relationships
Technical Vocabulary:	Interior angle, exterior angle, angle sum, proportional, two-dimensional figure, sequence, lines, angles, transformations, volume, formulas, cones, cylinders, spheres, transversal, parallel lines, rotations, reflections, translations, congruence, dilations, similarity, coordinates, symbolically, algebraic

Unit Title	Walk the Line		Length of Unit	6 weeks
Focusing Lens(es)	Change	**Standards and Grade Level Expectations Addressed in this Unit**	MA10-GR.8-S.2-GLE.1 MA10-GR.8-S.2-GLE.2 MA10-GR.8-S.2-GLE.3 MA10-GR.8-S.3-GLE.1	
Inquiry Questions (Engaging-Debatable):	• Why do some problems have no solution? (MA10-GR8-S.2-GLE.3)			
Unit Strands	Expressions and Equations, Functions, Statistics and Probability			
Concepts	Linear equations, model, linear relationships, proportional relationships, rate of change, representations, right triangles, similar triangles, scale factor, equivalence, slope, algebraic equations, one variable linear equations, intercept			

Generalizations My students will **Understand** that…	Guiding Questions	
	Factual	Conceptual
Linear equations use $y = mx$ to model proportional relationships and $y = mx + b$ to model relationships in terms of a rate of change and initial value (MA10-GR.8-S.2-GLE.1-EO.a, e)	How do you know when the equation of a line will be in the form $y = mx$ verses $y = mx + b$? What properties of a function make it a linear function? (MA10-GR8-S.2-GLE.3-IQ.3) How would you determine if a function is not linear?	How does the rate of change relate to the slope of a line? How does changing the y-intercept value change the structure of your linear equation?
Rate of change and intercepts exist in all representations of linear relationships. (MA10-GR8-S.2-GLE.3-EO.b.i, b.ii, b.iii) and (MA10-GR.8-S.3-GLE.1-EO.d)	What are 3 ways to represent a linear relationship? What do m and b represent in a linear representation? How does the context of the linear relationship help to interpret the rate of change and initial value of linear function? How can the rate of change and initial value be determined from a graph, table and equation? How can you write a linear equation from a graph, table or context?	How do different representations of a linear relationship represent the same data? Why do we represent linear relationships using different representations? Why are patterns and relationships represented in multiple ways? (MA10-GR8-S.2-GLE.3-IQ.2)
Right triangles created between any two distinct points on a non-vertical line in a coordinate plane form similar triangle with a scale factor equivalent to the slope of the line. (MA10-GR.8-S.2-GLE.1-EO.a, b)	What is slope? How can you calculate slope by creating a right triangle from any two distinct points on a non-vertical line?	Why is the slope equivalent to the scale factor used in similar triangles? Why are the legs of two similar triangles, created on the same non-vertical line, proportional?

The creation of equivalent algebraic equations provides the necessary foundation for solving linear equations in one variable. MA10-GR8-S.2-GLE.2-EO.a.i, a.ii)	What are examples of a linear one variable equation with no solutions? What are examples of linear one variable equation with infinite solutions? How does creating equivalent expressions lead to the solution of one variable linear equations?	Why can a one variable linear equation have no solutions or infinite solutions? How does the context of the problem affect the reasonableness of a solution? (MA10-GR8-S.2-GLE.2-IQ.3)

Key Knowledge and Skills: **My students will…**	*What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.*

- Graph proportional relationships, interpreting the unit rate as the slope of the graph (MA10-GR8-S.2-GLE.1-EO.a)
- Compare two different proportional relationships represented in different ways (MA10-GR8-S.2-GLE.1-EO.c)
- 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 (MA10-GR8-S.2-GLE.1-EO.d)
- 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. (MA10-GR8-S.2-GLE.1-EO.d)
- 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). (MA10-GR8-S.2-GLE.2-EO.a.i)
- Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms (MA10-GR8-S.2-GLE.2-EO.a.ii)
- Construct a function to model a linear relationship between two quantities and 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 (MA10-GR8-S.2-GLE.3-EO.EO.b.i, b.ii)
- 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 (MA10-GR8-S.2-GLE.3-EO.b.iii)
- Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept (MA10-GR8-S.3-GLE.1-EO.d)

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A student in _____ can demonstrate the ability to apply and comprehend critical language through the following statement(s):	*There is a relationship between slope, unit rate, and rate of change in linear relationships.* *Slopes and initial values can be found for linear equations represented in different ways.*
Academic Vocabulary:	Calculate, interpret, graph, relationship, interpret, solve, construct, compare
Technical Vocabulary:	Linear equations, model, linear relationships, proportional relationships, rate of change, representations, right triangles, similar triangles, scale factor, equivalence, slope, algebraic equations, one variable linear equations, unit rate, intercept, origin, variable, solution, distributive property, like terms, coefficient, bivariate measurement data

Unit Title	Whose Line is It?		Length of Unit	5 weeks
Focusing Lens(es)	Relationships Systems	**Standards and Grade Level Expectations Addressed in this Unit**	MA10-GR.8-S.2-GLE.2 MA10-GR.8-S.2-GLE.3	
Inquiry Questions (Engaging-Debatable):	• What is the best cell phone plan?			
Unit Strands	Expressions and Equations, Functions, Personal Financial Literacy			
Concepts	Functions, output, input, properties, multiple representations, comparisons, graphs, qualitative, systems of linear equations, appropriateness, intersection, linear functions			

Generalizations **My students will Understand that…**	**Guiding Questions**	
	Factual	**Conceptual**
Functions assign exactly one output for each input value. (MA10-GR.8-S.2-GLE.3-EO.a.i)	What are two ways to determine whether a rule is a function? How can you create an ordered pair from a function that can be graphed?	Why is every function a relationship but not every relationship is a function?
Properties of any function, in multiple representations, create opportunities for comparisons across representations (MA10-GR.8-S.2-GLE.3-EO.a.iii)	What are different ways to represent a function? What properties of a function make it a linear function? (MA10-GR.8-S.2-GLE.3-IQ.3)	How representations of functions interrelated? Why is it helpful to compare functions in multiple representations?
Graphs of functions qualitatively represent the relationship between two quantities. (MA10-GR.8-S.2-GLE.2-EO.b)	How does a graph show the qualitative features of a function such as whether it is increasing or decreasing?	How can you sketch a graph from a verbal description of a function?
Mathematicians solve systems of two linear equations in different ways based on the appropriateness of the method. (MA10-GR.8-S.2-GLE.2.b.i)	What ways can you solve a system of equations? What makes a solution strategy both efficient and effective? (MA10-GR.8-S.2-GLE.2-IQ.1)	Why are there multiple ways to solve system of equations problems?
Solutions to a system of linear equations correspond to the points of intersection on a graph. (MA10-GR.8-S.2-GLE.2-EO.b.iii, b.iv)	What does it mean when there is no point of intersection for a system of linear equations problem? If two linear equations graph to the same line, what is the solution to the system of equations?	Why does the point of intersection of a system of equations represent their solution? Why can two equations be added together to get another true equation? (MA10-GR.8-S.2-GLE.2-IQ.4)

Key Knowledge and Skills: My students will…	*What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.*

- Understand 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 (MA10-GR.8-S.2-GLE.2-EO.b.i)
- Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations; solve simple cases by inspection (MA10-GR.8-S.2-GLE.2-EO.b.ii)
- Solve real-world and mathematical problems leading to two linear equations in two variables (MA10-GR.8-S.2-GLE.2-EO.b.iii)
- Define a function as a rule that assigns to each input exactly one output; recognize the graph of a function is the set of ordered pairs consisting of an input and the corresponding output MA10-GR.8-S.2-GLE.3-EO.a.i)
- Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions) (MA10-GR.8-S.2-GLE.3-EO.a.iii)
- 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 (MA10-GR.8-S.2-GLE.3-EO.a.iv, a.v)
- Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear) (MA10-GR.8-S.2-GLE.3-EO.b.iv)
- Sketch a graph that exhibits the qualitative features of a function that has been described verbally (MA10-GR.8-S.2-GLE.3-EO.b.v)
- Analyze how credit and debt impact personal financial goals. (MA10-GR.8-S.2-GLE.3-EO.b.iv)*

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A student in _____ can demonstrate the ability to apply and comprehend critical language through the following statement(s):	*Functions can be represented as situations, tables, graphs, or equations for sake of comparison*
Academic Vocabulary:	Describe, compare, represent, interpret, analyze, solve, determine, sketch, analyze, credit, debt, goals
Technical Vocabulary:	Functions, output, input, properties, multiple representations, comparisons, graphs, qualitative, systems of linear equations, appropriateness, intersection, linear functions, non-linear functions, satisfy,

*Denotes connection to Personal Financial Literacy (PFL)

Unit Title	Frequently Scatter Brained			Length of Unit	3 weeks
Focusing Lens(es)	Interpretation	**Standards and Grade Level Expectations Addressed in this Unit**	MA10-GR.8-S.3-GLE.1		
Inquiry Questions (Engaging-Debatable):	• How can you tell if a pattern in the data is a coincidence or trend? (MA10-GR.8-S.3-GLE.1-IQ.2)				
Unit Strands	Statistics and Probability				
Concepts	Scatter plots, association, bivariate, measurement data, two-way tables, categorical, frequencies, relative frequencies				

Generalizations My students will **Understand** that…	Guiding Questions	
	Factual	**Conceptual**
Mathematicians construct scatter plots to investigate and describe possible associations between bivariate measurement data. (MA10-GR.8-S.3-GLE.1-EO.a, b, c)	Do all scatter plots show some type of association? How do you determine if a scatter plot has a positive or negative association? What do clusters or outliers on a scatter plot tell you about the relationship between two quantities? How can you determine if a linear function would be an appropriate model for a scatter plot?	How can data lead to incorrect conclusions? (MA10-GR.8-S.3-GLE.1-IQ.3) Why are linear functions (straight lines) commonly used to model relationships between two variables?
Two-way tables represent bivariate categorical data by displaying frequencies and relative frequencies. (MA10-GR.8-S.3-GLE.1-EO.e)	What associations can be interpreted from a two-way table?	Why is it important to examine relative frequencies and not just frequencies when determining if an association between two categorical variables exists?

Key Knowledge and Skills: **My students will…**	*What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.*

- Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities and describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association (MA10-GR.8-S.3-GLE.1-EO.a, b)
- Know that straight lines are widely used to model relationships between two quantitative variables (MA10-GR.8-S.3-GLE.1-EO.c)
- Fit a straight line Informally for scatter plots that suggest a linear association, and informally assess the model fit by judging the closeness of the data points to the line (MA10-GR.8-S.3-GLE.1-EO.c)
- Understand patterns of association can be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table (MA10-GR.8-S.3-GLE.1-EO.e)
- Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects and use relative frequencies calculated for rows or columns to describe possible association between the two variables (MA10-GR.8-S.3-GLE.1-EO.a.i, e.ii)

Critical Language: includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline. EXAMPLE: A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: *"Mark Twain exposes the hypocrisy of slavery through the use of satire."*	
A student in _____ can demonstrate the ability to apply and comprehend critical language through the following statement(s):	*Some scatter plots can be modeled by a linear function* *Clustering, outliers, and associations are ways to describe patterns in bivariate data*
Academic Vocabulary:	Data, interpret, construct, display, patterns, data
Technical Vocabulary:	Scatter plots, association, bivariate, measurement data, two-way tables, categorical, frequencies, relative frequencies, outliers, clustering, positive association, negative association, trends, linear association, line of best fit, model,