UNIT 1 - THE NUMBER SYSTEM M08-A.N.

Lesson Number	Subject	PA Assessment Anchor	CCSS
1	Apply concepts of rational and irrational numbers	M08.A-N.1.1	8.NS.A.1
2	Apply concepts of rational and irrational numbers	M08.A-N.1.2	8.NS.A.1
3	Apply concepts of rational and irrational numbers	M08.A.N.1.3	8.NS.A.1
		Quiz Lessons 1-3	
4	Apply concepts of rational and irrational numbers	M08.A-N.1.1.4	8.NS.A.2
5	Apply concepts of rational and irrational numbers	M08.A.N.1..1.5	8.NS.A.2
		Quiz Lessons 4 & 5	
		Exam Lessons 1-5	
6	Represent and use expressions and equations to solve problems involving radicals and integer exponents.	M08.B-E.1.1.1	8.EE.A.1
7	Represent and use expressions and equations to solve problems involving radicals and integer exponents.	M08.B-E.1.1.1	8.EE.A.1
8	Represent and use expressions and equations to solve problems involving radicals and integer exponents.	M08.B-E.1.1.2	8.EE.A.2
9	Represent and use expressions and equations to solve problems involving radicals and integer exponents.	M08.B-E.1.1.3	8.EE.A.3
		Quiz Lessons 6-8	
10	Represent and use expressions and equations to solve problems involving radicals and integer exponents.	M08.B-E.1.1.3	8.EE.A.3

11	Represent and use expressions and equations to solve problems involving radicals and integer exponents.	M08.B-E.1.1.4 Quiz Lessons 9-11 Exam Lessons 1 -11	8.EE.A.4
12	Solve problems involving right triangles by applying the Pythagorean Theorem	M08.C-G.2.1.2	8.G.B.7
13	Solve problems involving right triangles by applying the Pythagorean Theorem	M08.C-G.2.1.1	8.G.B.6
14	Solve problems involving right triangles by applying the Pythagorean Theorem	M08.C-G.2.1.3 Quiz lessons 12-14 Exam Lessons 1-14	8.G.B.8

Essential Question - How do we know that all numbers are not rational, and how do we approximate irrational numbers by using rational numbers?

Eligible Content

Determine whether a number is rational or irrational. For rational numbers, show that the decimal expansion terminates or repeats (limit repeating decimals to thousandths).

Convert a terminating or repeating decimal is not a rational number (limit repeating decimals to thousandths).

Estimate the value of irrational numbers without a calculator (limit whole number radicand to less than 144).

Use rational approximations of irrational numbers to compare and order irrational numbers.

Locate/identify rational and irrational numbers at their approximate locations on a number line.

Apply one or more properties of integer exponents to generate equivalent numerical expressions without a calculator (with final answers expressed in exponential form with positive exponents).

same

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 perfect squares (up to and including 12^2) and cube roots of perfect cubes (up to and including 5^3) without a calculator.

Estimate very large or very small quantities by using numbers expressed in the form of a single digit times an integer power of 10, and express how many times larger or smaller one number is another.

same

Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Express answers in 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 (e.g., interpret 4.7EE9 displayed on a calculator as 4.7 x 10^9)

Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

Apply the converse of the Pythagorean Theorem to show a triangle is a right triangle.

Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Goals	Teaching Resources
Students should be able to identify rational and irrational numbers. Students should be able to represent rational numbers as terminating or repeating decimals.	Algebra 2.7
Given a terminating or repeating decimal, students should be able to convert that number to a rational number.	Algebra 2.7
Students should be able to approximate the value of a given irrational number to the closest whole number without a calculator.	Algebra 2.7
Students should be able to order groups of irrational numbers by approximation and by placing approximations of irrational numbers on a number line.	Algebra 2.7; 11.2
Students should be able to use a number line to represent/order both rational and irrational numbers.	Algebra 2.7; 11.2
Students should be able to apply the laws of exponents using multiplication	Algebra 8.1-8.3
Students should be able to apply the laws of exponents using division	Algebra 8.1-8.3
Students should be able to apply properties of perfect squares and perfect cubes.	Algebra 8.1 and 11.2
Students should be able to apply laws of exponents to scientific notation of LARGE numbers.	Algebra 8.4
Students should be able to apply laws of exponents to scientific notation of SMALL numbers.	Algebra 8.4

Operations with numbers in scientific notation	Algebra 8.4
Students should be able to apply the Pythagorean Theorem to find missing side lengths of right triangles. These should apply to real-world contexts such as pitches in a roof line (triangular prism), zip line application, and directions using GPS or coordinate Geometry.	Algebra 11.4
Given three side lengths, students should be able to use the Pythagorean theorem to determine if the given measures create a right triangle.	Algebra 11.4
Students should be able to use two points in the coordinate plane and the Pythagorean Theorem to solve for the distance between the points.	Algebra 11.4

Homework Assignment

UNIT 2 - Statistics and Probability **M08.D-S**

Lesson Number	Subject	PA Assessment Anchor	CCSS
15	Analyze and interpret bivariate data displayed in multiple representations	M.08.D-S.1.1.1	8.SP.A.1
16	Analyze and interpret bivariate data displayed in multiple representations	M08.D-S.1.1.2	8.SP.A.2
17	Analyze and interpret bivariate data displayed in multiple representations	M08.D-S.1.1.3 Quiz lessons 15-17	8.SP.A.3
18	Understand that patterns of association can be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table.	M08.D-S.1.2.1 Quiz lesson 18 Exam Lessons 1-18	8.SP.A.4

Essential Question - How do we analyze and investigate bivariate data to recognize patterns?

Eligible Content

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 correlation, linear association, and nonlinear association.
For scatter plots that suggest a linear association, identify a line of best fit by judging the closeness of the data points to the line.

Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.

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 associations between the two variables.

Goals	Teaching Resources
Students should be able to create a scatterplot or interpret information from a given scatterplot. They should recognize types of correlation and outlier values.	Algebra 5.6, 5.7
Students should be able to create a line of best fit for positive and negative correlation graphs.	Algebra 5.6, 5.7
Student should be able to determine the slope and intercept of a line of best fit, and should be able to interpret the meaning of the rate of change.	Algebra 5.6, 5.7
Student should be able to create a two-way frequency table and shoud be able to interpret data on a given two-way frequency table. They should be able determine whether or not a relationship exists between the two variables.	Algebra 1.7 activity

Homework Assignment

UNIT 3 - Expressions and Equations **M08-B.E**

Lesson Number	Subject	PA Assessment Anchor	CCSS
19	Write, solve, graph, and interpret linear equation in one or two variables, using various methods.	M08.B-E.3.1.1	8.EE.C.7
20	Write, solve, graph, and interpret linear equation in one or two variables, using various methods.	M08.B-E.3.1.2 Quiz 19, 20	8.EE.C.7
21	Write, solve, graph, and interpret linear equation in one or two variables, using various methods.	M08.B-E.3.1.2	8.EE.C.7
22	Write, solve, graph, and interpret linear equation in one or two variables, using various methods.	M08.B-E.3.1.1 Quiz 21, 22	8.EE.C.7
23	Apply volume formulas of cones, cylinders, and spheres.	M.08.C-G.3.1.1 Quiz Lesson 23 Exam Lessons 1-23	8.G.C.9

Essential Question - How do we work with radical and integer exponents, how do we understand the connections between proportional relationships, lines, and linear equations, and how do we analyze and solve linear equations?

Eligible Content	Goals
Write and identify 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	Students should be able to solve single step equations.
Solve linear equations that have rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	Students should be able to solve multi-step equations.
Solve linear equations that have rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	Students should be able to solve multi-step equations with variables on both sides.
same	Students should be able to solve no solution and infinitely many solutions.
Apply formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems.	Students should be able to derive volume formulas from area formulas of simpler shapes. Students should be able to use given formulas on formula sheets to solve various volume problems.

Teaching Resources	Homework Assignment
Algebra 3.1	
Algebra 3.2, 3.3	
Algebra 3.4	
Algebra 3.4	
Algebra Skill Review pg 927	

	UNIT 4 - Functions	M08.B-F	
Lesson Number	Subject	PA Assessment Anchors	CCSS
24	Define, evaluate, and compare functions displayed algebraically, graphically, numerically in tables, or by verbal descriptions.	M08.B-F.1.1.1	8.F.A.1
25	Define, evaluate, and compare functions displayed algebraically, graphically, numerically in tables, or by verbal descriptions.	M08.B-F.1.1.2	8.F.A.2
26	Define, evaluate, and compare functions displayed algebraically, graphically, numerically in tables, or by verbal descriptions.	M08.B-F.1.1.3 Quiz Lessons 24-26	8.F.A.3
27	Represent or intepret functional relationships between quantities using tables, graphs, and descriptions.	M.08.B-F.2.1.1	8.F.B.4
28	Represent or intepret functional relationships between quantities using tables, graphs, and descriptions.	M.08.B-F.2.1.2 Quiz Lessons 27 - 28 Exam Lesson 1 - 28	8.F.B.5
29	Analyze and describe linear relationships between two variables, using slope.	M08.B-E.2.1.3	8.F.A.3
30	Analyze and describe linear relationships between two variables, using slope.	M08.B-E.2.1.1	8.EE.B.5

31	Analyze and describe linear relationships between two variables, using slope.	M08.B-E.2.1.2	8.EE.B.6
		Quiz 29-31	
		Exam Lessons 1-31	

Essential Question - How do we define, evaluate, and compare functions, and how do we use functions to model relationships between quantities?

Eligible Content	Goals
Determine whether a relations is a function.	Students should be able to define a function and determine if a given relations (in table or graph) is a function.
Compare properties of two functions each represented in a different way (i.e., algebraically, graphically, numerically in tables, or by verbal descriptions).	Students should be able to compare rates of change between two different functions that are represented in two different forms.
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.	Students should be able to compare and contrast functions whose graphs are and are not straight lines. Students should be able to create a table of values and graph functions.
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.	Students should be able to develop a function model from a given graph or t-chart table. Students should be able to calculate the slope and determine rate of change.
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 or determine a graph that exhibits the qualitative features of a function that has been described verbally.	Students should be able to identify, describe, and graph characteristics of functions.
Derive the equation $y = mx$ for a line through the origin and the origin and the equation $y=mx + b$ for a line intercepting the vertical axis at b .	Students should be able to calculate and apply slope of a line to an equation.
Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	Students should be able to analyze proportions and interpret the unit rate by analyzing a graph.

Use similar right triangles to show and explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane.	Students should be able to apply slope of a line to shapes in the coordinate plane.

Teaching Resources	Homework Assignment
Algebra 1.6, 1.7, Extension 1.7 pg 49	
Algebra 1.6 and 1.7	
Algebra 4.5 and 4.7	
Algebra 1.6 and 1.7, 4.4 (rate of change) and 4.7	
Algebra 1.6 and 1.7, 4.4 (rate of change) and 4.7	
Algebra 5.1	
Algebra 3.5 and 3.6	

Algebra 4.4 and 4.5

	UNIT 4 - Geometry	M08.C-G	
Lesson Number	Subject	PA Assessment Anchors	CCSS
32	Apply properties of geometric transformations to verify congruence or similarity.	M08.C-G.1.1.1	8.G.A.1
33	Apply properties of geometric transformations to verify congruence or similarity.	M08.C-G.1.1.2	8.G.A.2
		Quiz Lessons 32 and 33	
34	Apply properties of geometric transformations to verify congruence or similarity.	M08.C-G.1.1.3	8.G.A.3
35	Apply properties of geometric transformations to verify congruence or similarity.	M08.C-G.1.1.4	8.G.A.4
		Quiz Lessons 34 and 35	
		Exam 1-35	

Essential Question - What does congruency and similarity mean, how do we apply the Pythagorean Theorem in real-world situations, and how do we solve problems that involve volume of cylinders, cones, and prisms?

Eligible Content	Goals
Identify and apply properties of rotations, reflections, and translations (ex. Angle measures are preserved in rotations, reflections, and translations). Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them.	Students should be able to perform various transformations and describe properties of those transformations. Students should be able to perform a series of transformations, describe the steps that are made, and illustrate congruence in a 2-D space.
Describe the effects of dilations, translations, rotations, and reflections on two-dimensional figures, using coordinates. Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.	Students should be able to map translation effects on the coordinate plane and identify coordinates of vertices. Students should be able to identify a series of transformations that are necessary to transform one shape into another.

Teaching Resources	Homework Assignment
Algebra pg 923	
Algebra pg 923	
Algebra pg 923	
Algebra pg 923	

	UNIT 6 - Systems of Equations	M08-B.E	
Lesson Number	**Subject**	**PA Assesment Anchors**	**CCSS**
36	Write, solve, graph, and interpret linear equation in one or two variables, using various methods.	M08.B-E.3.1.3	8.EE.C.8
37	Write, solve, graph, and interpret linear equation in one or two variables, using various methods.	M08.B-E.3.1.4	8.EE.C.8
38	Write, solve, graph, and interpret linear equation in one or two variables, using various methods.	M08.B-E.3.1.5	8.EE.C.8
		Quiz Lessons 36-38	
		Exam Lessons 1-38	

Essential Question - How do we analyze and solve linear systems of equations?

Eligible Content	Goals
Interpret solutions to a system of two linear equations in two variables as points of intersection of their graphs, because points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	Students should be able to solve systems of equations by graphing.
Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.	Students should be able to solve systems of equations by linear combinations.
Solve real-world and mathematical problems leading to two linear equations in two variables.	Students should be able to solve real-life applications of systems of equations.

Teaching Resources	Homework Assignment
Algebra 7.1	
Algebra 7.2 (substitution), 7.3 and 7.4(adding, subtractin, multiplying first)	
Algebra Ch 7	