



Diocese of Fresno
Office of Catholic Education

In Partnership with



Present

MATHEMATICS POWER STANDARDS 2021-2022

EIGHTH GRADE

Introduction

In June 2021, a committee comprised of teachers and administrators led by Dr. Bill Sternberg from Creative Leadership Solutions worked over a period of three days to identify math Power Standards in Kindergarten through 8th Grade (and Algebra). This work, grounded in research from Doug Reeves, Larry Ainsworth, Dylan Wiliam and others offered the opportunity to collaboratively identify those standards that would be consistently focused upon throughout the year for maximum learning impact in math. The following three criteria were used in the identification of these standards:

Leverage: *Does this indicator apply to other subjects?*

Endurance: *Will this indicator be taught over multiple years of instruction?*

Essentiality: *Is this indicator an essential skill students need to know and be able to do as soon as they enter their next level of instruction?*

Over the course of three days, our committee met in grade level teams to first identify those indicators that possessed leverage. From this list, grade level teams then identified indicators that also possessed endurance, effectively reducing the number of indicators from the original list. Lastly, grade level teams were paired with their vertical counterparts (e.g., Kindergarten was paired with First Grade) to identify indicators that possessed essentiality. Thus, from a list of 30 (or more) grade level math indicators, teams were able to identify 8-12 (depending upon grade level) indicators that would become Power Standards for their specific grade level.

As explained during this process, the intent is to focus consistently on these Power Standards through multiple units of instruction. In reviewing grade level math indicators, there are some that do not require an equal amount of focus as others: In other words, there are supporting standards that may only need to be taught for a smaller time period (e.g., 4-6 weeks) in order for a student to demonstrate mastery of that specific indicator. However, Power Standards identified in this process are those that will require a much more concerted focus throughout the academic year to better prepare students in their learning journey.

Under each Power Standard identified, you'll note graphic organizers that identify the *Concepts* (nouns or noun phrases) of each Power Standard along with *Skills* (what we want students to know and be able to do). As well, there is a section labeled "*Topics*" which allows other content area teachers to identify units of instruction where these specific Power Standards can be inserted as a means of building cross-curricular connections. The "*Topics*" section is one that should continually be added to over time as there will undoubtedly be multiple opportunities for insertion of these Power Standards in other content areas.

The last piece you'll note under each identified Power Standard is a table listing "*Big Ideas*" and "*Essential Questions*". The "*Big Ideas*" are those critical understandings of the purpose and meaning behind learning the Power Standard that we want students to possess in *their own words*. In essence, students should know the *why* of what they are learning, not just the *what*. The "*Essential Questions*" are those questions teachers use during instruction encompassing these Power Standards as a means to build interest and understanding from their students. We would expect student replies to these "*Essential Questions*" to resemble the "*Big Ideas*" within this table.

Contents

Power Standard #1:	6
NS2. 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.	6
Power Standard #2:	9
EE1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	9
Power Standard #3:	12
EE2. 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. Know that $\sqrt{2}$ is irrational.	12
Power Standard #4:	13
EE4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.	15
Power Standard #5:	18
EE5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	18
Power Standard #6:	21
EE8b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.	21
Power Standard #7:	24
F1. 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.	24
Power Standard #8:	27
F3. 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.	27
Power Standard #9:	30
G5. 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.	30
Power Standard #10:	34
G7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	34
Power Standard #11:	37

G8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. 37

Power Standard #12: 40

SP1. 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. 40

Power Standard #1:

NS2. 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.

<p style="text-align: center;"><u>Concepts</u></p> <ul style="list-style-type: none">● rational numbers● rational approximations● irrational numbers● number line diagram● value of expressions● size	<p style="text-align: center;"><u>Skills</u></p> <ul style="list-style-type: none">● Use rational approximations of irrational numbers● compare the size of irrational numbers● locate them approximately on a number line diagram● estimate the value of expressions
<p style="text-align: center;"><u>Topics</u></p> <ul style="list-style-type: none">● Rational approximations of irrational numbers● Science- Reading thermometers- Celsius, Fahrenheit, kelvins; conversion of numbers● Social Studies- Geography, sea level, weather, climate; create timelines of events● ELA- reading word problems as they relate to irrational numbers, i.e., “below” or “above” sea level to indicate location on a number line; create timelines of events	

<p style="text-align: center;"><u>Big Ideas</u></p> <ul style="list-style-type: none">● Locate and plot a rational and irrational number on a number line.● Estimate value of rational and irrational numbers. ● to understand the size of a rational and irrational number.	<p style="text-align: center;"><u>Essential Questions</u></p> <ul style="list-style-type: none">● How do you know if a number is rational or irrational?● How do you use a number line to compare the size of rational and irrational numbers?
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Bloom's Taxonomy Level: Understand

Depth of Knowledge Level: Level 1

Assessment Item:

Estimate the following irrational numbers to the nearest tenth and place them from least to greatest on a number line.

$$\sqrt{31} \quad \sqrt{7} \quad \sqrt{24} \quad \sqrt{17}$$

Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT

Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
I can identify irrational numbers.	3	2	1	
I can place irrational numbers on the number line.	3	2	1	
I can estimate irrational numbers to the nearest tenth	3	2	1	

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can identify irrational numbers.	Correctly identify a irrational number		Can not identify irrational numbers
I can place irrational numbers on the number line.	Correctly places the estimated value on a number line of appropriate measure.	Correctly places a misestimated value on a number line.	Does not identify irrational numbers on a number line.
I can estimate irrational numbers to the nearest tenth	Convert each number to a decimal equivalent, using estimation to find equivalents for irrational numbers.	Convert each number to a whole number equivalent, using estimation to find equivalents for irrational numbers.	Cannot convert each number to a decimal equivalent, using estimation to find equivalents for irrational numbers.

Power Standard #2:

EE1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

<p style="text-align: center;"><u>Concepts</u></p> <ul style="list-style-type: none">• integers• exponents• properties of integer exponents• equivalent numerical expressions	<p style="text-align: center;"><u>Skills</u></p> <ul style="list-style-type: none">• Know the properties of integer exponents• Apply the properties of integer exponents• generate equivalent numerical expressions.
<p style="text-align: center;"><u>Topics</u></p> <ul style="list-style-type: none">• Science- cause/effect; action/reaction; scientific notation used in science measurement, formulas, graphing• Social studies- cause/effect; action/reaction, graphing data• ELA- cause/effect	

<p style="text-align: center;">Big Ideas</p> <ul style="list-style-type: none">• Know the properties of integer exponents.• Use the properties of integer exponents to solve/simplify expressions.• to know how to write numbers in different numeric forms	<p style="text-align: center;">Essential Questions</p> <ul style="list-style-type: none">• How do you evaluate a numerical expression with integer exponents?• What are the laws of exponents?• How could it be helpful to write numbers in exponents versus standard form?
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Bloom's Taxonomy Level: Apply

Depth of Knowledge Level: Level 1

Assessment Item:

Simplify the following exponential expression using the properties of exponents.

$$5^{-1} \times 5^4$$

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Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT

Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
I can apply the negative exponent properties to rational number expressions.	3	2	1	
I can apply the product of power properties of exponents to rational number expression.	3	2	1	
I can simplify exponential expressions and write numbers in different numeric forms.	3	2	1	

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can apply the negative exponent properties to rational number expressions.	Correctly apply the negative exponent property	Applied the negative exponent property with minor errors	Does not consider the properties of a negative exponent.
I can apply the product of power properties of exponents to rational number expression.	Correctly multiply rational number expressions using the product of powers exponent property	Multiply rational number expressions using the product of powers exponent property with minor errors	Unable to multiple rational number expressions using product of powers exponent property
I can simplify exponential expressions and write numbers in different numeric forms.	Simplified the exponential expression correctly	Did not simplify the expression fully	Unable to complete the operation.

Power Standard #3:

EE2. 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. Know that $\sqrt{2}$ is irrational.

<p style="text-align: center;"><u>Concepts</u></p> <ul style="list-style-type: none"> ● cube root symbols ● square root symbols ● solutions ● equations ● equations of the form $x^2 = p$ and $x^3 = p$ <ul style="list-style-type: none"> ○ p is a positive rational number ● square roots of small perfect squares ● cube roots of small perfect cubes ● irrational 	<p style="text-align: center;"><u>Skills</u></p> <ul style="list-style-type: none"> ● Use square root ● Use cube root symbols ● represent solutions to equations of the form $x^2 = p$ and $x^3 = p$ ● Evaluate square roots of small perfect squares ● Evaluate cube roots of small perfect cubes ● Know that $\sqrt{2}$ is irrational
<p style="text-align: center;"><u>Topics</u></p> <ul style="list-style-type: none"> ● Science- cause/effect; action/reaction; scientific notation used in science measurement, formulas, graphing ● Social studies- cause/effect; action/reaction, graphing data ● ELA- cause/effect 	

<p style="text-align: center;"><u>Big Ideas</u></p> <ul style="list-style-type: none"> ● Use the square root symbols to represent solutions to equations. ● Use the cube root symbols to represent solutions to equations. ● Evaluate the square root of a perfect square. ● Evaluate the cube root of a perfect cube. ● Distinguish rational and irrational numbers in square root and cube root form. ● to write large numbers in a simplified form. ● to see the connections between equations and 2-d figures and 3-d figures. ● to see how exponents and roots are opposites. 	<p style="text-align: center;"><u>Essential Questions</u></p> <ul style="list-style-type: none"> ● What are the numbers that are perfect squares and non-perfect squares? ● What are the numbers that are perfect cubes and non-perfect cubes? ● How can you distinguish rational and irrational numbers in square root and cube root form?
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Bloom's Taxonomy Level: Understand
Depth of Knowledge Level: Level 1

Assessment Item:

Evaluate the following expression $x^2 = 64$

Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT

Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
	3	2	1	
I can evaluate square roots of small perfect squares.	3	2	1	
	3	2	1	

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can evaluate square roots of small perfect squares.	Correctly evaluates square roots of small perfect squares	Evaluates square roots of small perfect squares with minor details.	Cannot evaluate a square root of small perfect squares.

Power Standard #4:

8.EE4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.

<u>Concepts</u>	<u>Skills</u>
<ul style="list-style-type: none"> operations 	

<ul style="list-style-type: none"> • numbers • scientific notation • decimal • problems 	<ul style="list-style-type: none"> • Perform operations with numbers expressed in scientific notation • Perform operations with numbers expressed in decimals and scientific notation
<u>Topics</u>	
<ul style="list-style-type: none"> • Science- cause/effect; action/reaction; scientific notation used in science measurement, formulas, graphing • Social studies- cause/effect; action/reaction, graphing data • ELA- cause/effect 	

<u>Big Ideas</u>	<u>Essential Questions</u>
<ul style="list-style-type: none"> • Perform operations on numbers in the form of decimals and scientific notation. • Relation decimal numbers and scientific notation. • Represent small and large numbers using scientific notation. • to write large numbers in a simplified form. 	<ul style="list-style-type: none"> • How do you use scientific notation and what examples can you think of that would use very small and very large numbers?

Bloom's Taxonomy Level: Apply
Depth of Knowledge Level: Level 2

Assessment Item:

If an object has a mass of 3.5×10^2 grams (g) and occupies a volume of 4.6×10^4 mL, what is the density of the object if density is mass divided by volume?

Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT
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Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
	3	2	1	
I can perform operations with numbers expressed in scientific notation.	3	2	1	
I can use scientific notation in examples that work with small or big numbers.	3	2	1	
	3	2	1	

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can perform operations with numbers expressed in scientific notation.	Correctly performs operations that combine operations with rational	Correctly performs operations with either rational numbers or	Incorrectly performs operations with both rational numbers and

	numbers and properties of exponents.	properties of exponents.	properties of exponents.
I can use scientific notation in examples that work with small or big numbers.	Correctly uses scientific notation in examples that work with small or big number	Uses scientific notation in examples that work with small or big number with minor details	Unable to use scientific notation in examples that works with small or big numbers
Let's also add something in here such as "I can follow the parameters in the problem to solve for density".			

Power Standard #5:

EE5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

<p style="text-align: center;"><u>Concepts</u></p> <ul style="list-style-type: none">• proportional relationships• unit rate• slope of the graph	<p style="text-align: center;"><u>Skills</u></p> <ul style="list-style-type: none">• Graph proportional relationships• interpret the unit rate as the slope of the graph• Compare two different proportional relationships represented in different ways
<p style="text-align: center;"><u>Topics</u></p> <ul style="list-style-type: none">• Science- cause/effect; action/reaction; scientific notation used in science measurement, formulas, graphing• Social studies- cause/effect; action/reaction, graphing data• ELA- cause/effect	

<p style="text-align: center;"><u>Big Ideas</u></p> <ul style="list-style-type: none">• Graph proportional relationships.• Interpret unit rate as a slope on a graph.• Use a table, an equation or graph to decide the unit rate of a proportional relationship.• Use graphed unit rate to compare different proportional relationships.• to see that proportional relationships can be displayed in different ways.	<p style="text-align: center;"><u>Essential Questions</u></p> <ul style="list-style-type: none">• How do you use the slope formula?• What does the slope of a proportional relationship mean in the context of a problem?• Where do you see the slope in a problem? In a table? In a graph? In an equation?
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Bloom's Taxonomy Level: Analyze

Depth of Knowledge Level: Level 2

Assessment Item:

Interpret the unit rates and compare

Under Plan A, a 2-minute call costs \$0.54 and a 4-minute call costs \$1.08. Under Plan B, the cost for x minutes is given by $y = 0.289x$. Which plan is cheaper? Why?

Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT

Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
I can interpret unit rate.	3	2	1	
I can compare unit rate represented in two different ways.	3	2	1	
I can explain the unit rate in terms of the situation	3	2	1	

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can interpret unit rate.	Interpret unit rate correctly for both situations	Correctly interpret unit rate in one situation	Did not correctly identify unit rate
I can compare unit rate represented in two different ways.	Compared unit rate correctly		Did not compare unit rate correctly
I can explain the unit rate in terms of the situation	Explains the unit rate in terms of the situation	Explains the unit rate in terms of the situation with minor detail	Did not correctly explain the unit rate in terms of the situation.

Power Standard #6:

EE8b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.

<p style="text-align: center;"><u>Concepts</u></p> <ul style="list-style-type: none">● systems of two linear equations● variables● solutions● simple cases● graphing● inspection● algebraically	<p style="text-align: center;"><u>Skills</u></p> <ul style="list-style-type: none">● Solve systems of two linear equations in two variables algebraically● estimate solutions by graphing the equations● Solve simple cases by inspection
<p style="text-align: center;"><u>Topics</u></p> <ul style="list-style-type: none">● Science- cause/effect; action/reaction; scientific notation used in science measurement, formulas, graphing● Social studies- cause/effect; action/reaction, graphing data● ELA- cause/effect	

<p style="text-align: center;"><u>Big Ideas</u></p> <ul style="list-style-type: none">● Solve a system of two linear equations algebraically.● Solve a system of two linear equations by estimating solutions by graphing the equations.● Solve a system of two linear equations by inspection.	<p style="text-align: center;"><u>Essential Questions</u></p> <ul style="list-style-type: none">● How do you solve a linear equation algebraically with one solution or no solution?● What does the point of intersection mean of a graph of a system of two linear equations?
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Bloom's Taxonomy Level: Apply

Depth of Knowledge Level: Level 2

Assessment Item:

Solve the following system of linear equations by graphing and confirm your solution algebraically.

$$2x + y = 8$$

$$x + 2y = 10$$

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Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT

Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
I can graph linear equations written in standard form.	3	2	1	
I can use substitution or elimination to algebraically solve systems of linear equations.	3	2	1	
I can identify a solution of a system of linear equations as a point of intersection.	3	2	1	
I can write my solution as an ordered pair				

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can graph linear equations written in standard form.	Correctly graphed both linear equations	Correctly graphed one linear equation	Incorrectly graphed the linear equations.
I can use substitution or elimination to algebraically solve systems of linear equations.	Correctly used substitution or eliminations to algebraically solve systems of linear equations.	Use substitution or eliminations to algebraically solve systems of linear equations with minor mistakes.	Incorrectly used substitution or eliminations to algebraically solve systems of linear equations
I can identify a solution of a system of linear equations as a point of intersection.	Correctly identified a solution of a system of linear equation as a point of intersection		Did not identify a solution of a system of linear equations as a point of intersection
I can write my solution as an ordered pair	Correctly wrote the solution as an ordered pair	Wrote the solution as an ordered pair, but mixed up x and y	Did not write the solution as an ordered pair

Power Standard #7:

F1. 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.

<p style="text-align: center;"><u>Concepts</u></p> <ul style="list-style-type: none">● function● rule● input● output● graph● set of ordered pairs● corresponding output	<p style="text-align: center;"><u>Skills</u></p> <ul style="list-style-type: none">● Understand that a function is a rule that assigns to each input exactly one output● Understand that a graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
<p style="text-align: center;"><u>Topics</u></p> <ul style="list-style-type: none">● Science- cause/effect; action/reaction; use of formulas● Social studies- cause/effect; action/reaction● ELA- cause/effect	

<p style="text-align: center;"><u>Big Ideas</u></p> <ul style="list-style-type: none">● Define a function as a rule, where for each input there is exactly one output.● Show the relationship between inputs and outputs of a function by graphing them as ordered pairs on a coordinate grid.● to see that one input has a corresponding output.	<p style="text-align: center;"><u>Essential Questions</u></p> <ul style="list-style-type: none">● How do you use functions to model relationships between quantities?● How do you define, evaluate, and compare functions?
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Bloom's Taxonomy Level: Understand

Depth of Knowledge Level: Level 2

Assessment Item:

Graph the following ordered pairs, and classify the graph as a function or not a function and explain how you know.

(0,2) (2,4) (4,6) (6, 8)

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Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT

Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
I can identify a function from a graph	3	2	1	
I can explain what a function is	3	2	1	
	3	2	1	

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can identify a function from a graph	Correctly identified a function		Incorrectly identified a function
I can explain what a function is	Correctly explained in detail what a function is	Explained what a function is with little detail	incorrectly explained what a function is

Power Standard #8:

F3. 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.

<p style="text-align: center;"><u>Concepts</u></p> <ul style="list-style-type: none">• equation $y = mx + b$• linear function• nonlinear function• straight line• graph	<p style="text-align: center;"><u>Skills</u></p> <ul style="list-style-type: none">• Interpret the equation $y = mx + b$ as defining a linear function• give examples of functions that are not linear
<p style="text-align: center;"><u>Topics</u></p> <ul style="list-style-type: none">• Science- cause/effect; action/reaction; use of formulas• Social studies- cause/effect; action/reaction• ELA- cause/effect	

<p style="text-align: center;"><u>Big Ideas</u></p> <ul style="list-style-type: none">• Explain why the equation $y=mx+b$ represents a linear function.• Find the slope and y-intercept in relation to the function.• Give examples of relationships and create a table of values that can be defined as a nonlinear function.	<p style="text-align: center;"><u>Essential Questions</u></p> <ul style="list-style-type: none">• What are examples of linear/nonlinear functions?• Are all linear equations functions? Are all functions linear? How do you know?
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Bloom's Taxonomy Level: Analyze

Depth of Knowledge Level: Level 2

Assessment Item:

Which graphs from the following set of equations are linear? Which are non-linear? Explain how you know. For the equations that are linear, identify the slope and y-intercept.

$$y = \frac{1}{2}x + 5$$

$$y = x^2 - 4$$

$$y = x^3 + 3$$

$$y = 5x$$

Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT

Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
I can identify a linear function in the form $y=mx+b$	3	2	1	
I can identify the slope of an equation in slope-intercept form	3	2	1	
I can identify the y-intercept of an equation in slope-intercept form	3	2	1	
I can explain why $y=mx+b$ represents a linear function				

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can identify a linear function in the form $y=mx+b$	Correctly identified all linear functions	Correctly identified most linear functions	Was unable to identify linear functions
I can identify the slope of an equation in slope-intercept form	Correctly identified the slope		Did not identify the slope
I can identify the y-intercept of an equation in slope-intercept form	Correctly identified the y-intercept		Did not identify the y-intercept
I can explain why $y=mx+b$ represents a linear function	Correctly explained in detail why $y=mx+b$ represents a linear function	Explained with some detail why $y=mx+b$ represents a linear function	Was unable to explain why $y=mx+b$ represents a linear function

Power Standard #9:

G5. 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.

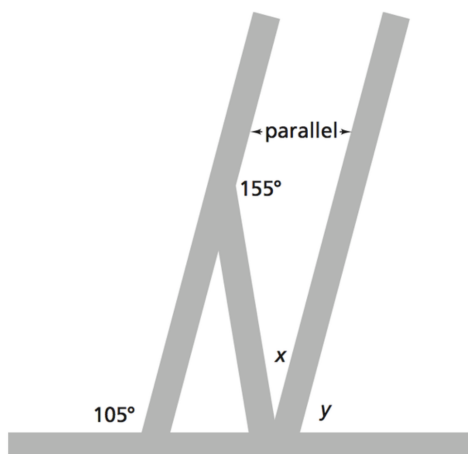
<p style="text-align: center;"><u>Concepts</u></p> <ul style="list-style-type: none">● informal arguments● facts● angle sum● exterior angles● triangles● parallel lines● transversal● cut by a transversal● angle-angle● criterion● similarity	<p style="text-align: center;"><u>Skills</u></p> <ul style="list-style-type: none">● Use informal arguments to establish facts about the angle sum for similarity of triangles● Use informal arguments to establish facts about the exterior angle of triangles for similarity of triangles● Use informal arguments to establish facts about angles created when parallel lines are cut by a transversal for similarity of triangles● Use informal arguments to establish facts about the angle-angle criterion for similarity of triangles
<p style="text-align: center;"><u>Topics</u></p> <ul style="list-style-type: none">● Science- speed, distance, rate, slope● Social studies- geography, mapping● ELA- cause/effect	

<u>Big Ideas</u>	<u>Essential Questions</u>
<ul style="list-style-type: none"> ● Prove that the sum of any triangle's interior angles will be the same measure as a straight angle. ● Prove that the sum of any polygon's exterior angles will be 360 degrees. ● Estimate the relationships of the angles created when two parallel lines are cut by a transversal. ● Estimate the measurements of the angles created when two parallel lines are cut by a transversal. ● to have a fluent understanding of angle relationships in triangles. ● knowledge can be applied to architecture, construction, etc. ● knowledge can be applied to games i.e., pool, soccer, football, etc. 	<ul style="list-style-type: none"> ● How does knowing two figures are congruent or similar help us solve problems? ● Why are corresponding angles congruent?

Bloom's Taxonomy Level: Analyze
Depth of Knowledge Level: Level 3

Assessment Item:

The figure shows four of the runways at Metropolitan Airport.



Find the measures of $\angle x$ and $\angle y$.

Explain which relationships between angles formed by two lines cut by a transversal you used to solve.

Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT

Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
I can estimate the measurements of the angles created when two parallel lines are cut by a transversal.	3	2	1	
I can explain which relationships between angles formed by two lines cut by a transversal I used to solve.	3	2	1	
	3	2	1	

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can estimate the measurements of the angles created when two parallel lines are cut by a transversal.	Correctly estimated the measurements of the unknown angles.	Correctly estimated the measurements of the unknown angles with minor errors	Did not correctly estimate the measurements of the unknown angles.
I can explain which relationships between angles formed by two lines cut by a transversal I used to solve.	Explained which relationships between angles formed by two lines cut by a transversal were used to solve in detail, showing understanding	Explained which relationships between angles formed by two lines cut by a transversal were used to solve in showing some understanding	Did not explain which relationships between angles formed by two lines cut by a transversal were used to solve.

Power Standard #10:

G7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

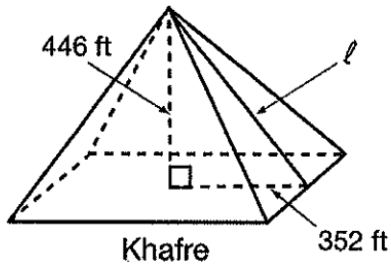
<p style="text-align: center;"><u>Concepts</u></p> <ul style="list-style-type: none"> ● Pythagorean Theorem ● side lengths ● right triangles ● real-world ● mathematical problems ● two and three dimensions 	<p style="text-align: center;"><u>Skills</u></p> <ul style="list-style-type: none"> ● Apply the Pythagorean Theorem to real-world problem ● Apply the Pythagorean Theorem to mathematical problem ● determine unknown side lengths in right triangles
<p><u>Topics</u></p> <ul style="list-style-type: none"> ● Science- speed, distance, rate, slope ● Social studies- geography, mapping ● ELA- drawing conclusions regarding people/events in a story 	

<p style="text-align: center;"><u>Big Ideas</u></p> <ul style="list-style-type: none"> ● Draw a diagram to use the Pythagorean Theorem to solve real world problems involving right triangles ● Draw a diagram to find right triangles in a three-dimensional figure. ● Use the Pythagorean Theorem to calculate various dimensions. ● Apply the Pythagorean Theorem to find an unknown side length of a right triangle. ● to understand the connection between area and square roots. ● knowledge can be applied to architecture, construction, etc. 	<p style="text-align: center;"><u>Essential Questions</u></p> <ul style="list-style-type: none"> ● What is the Pythagorean Theorem? ● How can you use Pythagorean Theorem to solve real world and mathematical problems?
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Bloom's Taxonomy Level: Apply

Depth of Knowledge Level: Level 3

Assessment Item:



Find the missing measure of Khafre's Pyramid to the nearest foot.

Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT

Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
I can apply the Pythagorean Theorem to find an unknown side length of a right triangle.	3	2	1	
I can solve for an unknown side length when using the pythagorean theorem.	3	2	1	
	3	2	1	

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can apply the Pythagorean Theorem to find an unknown side length of a right triangle.	Correctly substituted values for the variables in the pythagorean theorem		Did not correctly substitute the values for the variables in the pythagorean theorem
I can solve for an unknown side length when using the pythagorean theorem.	Correctly solved for the unknown side length	Solved for the unknown side length with minor errors	Did not correctly solve for the missing side length

Power Standard #11:

G8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

<p style="text-align: center;"><u>Concepts</u></p> <ul style="list-style-type: none">● Pythagorean Theorem● distance● two points● coordinate systems	<p style="text-align: center;"><u>Skills</u></p> <ul style="list-style-type: none">● Apply the Pythagorean Theorem● find the distance between two points in a coordinate system.
<p><u>Topics</u></p> <ul style="list-style-type: none">● Science- speed, distance, rate, slope● Social studies- geography, mapping● ELA- drawing conclusions regarding people/events in a story	

<p style="text-align: center;"><u>Big Ideas</u></p> <ul style="list-style-type: none">● Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.● to understand the connection between area and square roots.● knowledge can be applied to architecture, construction, etc.	<p style="text-align: center;"><u>Essential Questions</u></p> <ul style="list-style-type: none">● How can you apply the Pythagorean Theorem to find the distance between two points?
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Bloom's Taxonomy Level: Apply

Depth of Knowledge Level: Level 1

Assessment Item:

Find the distance between the points (3, 5) and (-3, 3) using the pythagorean theorem.

Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT

Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
	3	2	1	
	3	2	1	
	3	2	1	

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can apply the pythagorean theorem to find the distance between two points on a coordinate plane	Correctly applied the pythagorean theorem to find the distance between the two points on the coordinate plane	Applied the pythagorean theorem to find the distance between the two points on the coordinate plane with minor errors.	Did not apply the pythagorean theorem to find the distance between the two points on the coordinate plane.
I can plot the coordinates on the coordinate plane.	I can correctly plot the coordinates on the coordinate plane		I cannot plot the coordinates on the coordinate plane

Power Standard #12:

SP1. 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.

<u>Concepts</u>	<u>Skills</u>
<ul style="list-style-type: none">● scatter plots● bivariate measurement data● patterns of association● quantities● clustering● outliers● positive association● negative association● linear association● nonlinear association	<ul style="list-style-type: none">● Construct scatter plots● interpret scatter plots● investigate patterns of association● Describe patterns of association
<u>Topics</u>	
<ul style="list-style-type: none">● Science- comparing two or more variables in data analysis, linear and nonlinear cause and effect, investigating patterns; i.e., biology- additional hour of sunlight associated with greater growth based on data points on scatter plot● Social studies- cause and effect, compare and contrast● ELA- positive and negative connotation and association, cause and effect, compare and contrast, understanding patterns of association between current events and what is being read, character/event analysis, citing evidence	

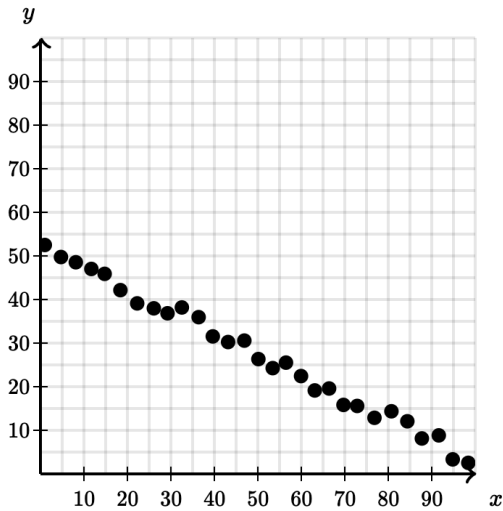
<u>Big Ideas</u>	<u>Essential Questions</u>
<ul style="list-style-type: none">● Plot ordered pairs on a coordinate grid representing the relationship between two data sets.● Describe patterns such as clustering, outliers, positive or negative association, linear association and nonlinear association.● to be able to visually represent data.● to make decisions based on interpretation of data patterns.	<ul style="list-style-type: none">● What kind of patterns can be found in bivariate data?● What kind of patterns and associations can you see from looking at a scatter plot?● How can patterns such as clustering, outliers, positive or negative association, linear association and nonlinear association help you understand the relationship between two data sets?

	<ul style="list-style-type: none"> • Why is it important to describe patterns of association between two quantities?
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Bloom's Taxonomy Level: Analyze
Depth of Knowledge Level: Level 3

Assessment Item:

Describe patterns such as clustering, outliers, positive or negative association, linear association and nonlinear association.



Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT	TEACHER ASSESSMENT

Point Value Three-Column Rubric

EXPECTATION	STUDENT SELF-ASSESSMENT			TEACHER ASSESSMENT
	3	2	1	
	3	2	1	
	3	2	1	
	3	2	1	

*If using point values, create explicit expectations for student performance under each point value for each specific standard expectation.

EXPECTATION	3	2	1
I can describe patterns such as clustering, outliers, positive or negative association, linear association and nonlinear association.	Correctly describes patterns such as clustering, outliers, positive or negative association, linear association and nonlinear association.	Describe patterns such as clustering, outliers, positive or negative association, linear association and nonlinear association in some detail	Cannot describe patterns such as clustering, outliers, positive or negative association, linear association and nonlinear association.
