Glendale Elementary School District

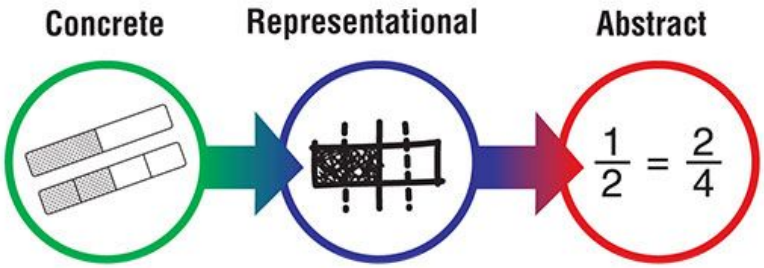
Mathematics Pacing Guide

2020-2021

8th Grade

By the end of eighth grade, students will be able to...

- **8th Grade Develop understanding of irrational numbers.**
  - Students use their understanding of multiplication and apply properties to develop understanding of radicals and integer exponents . They use their knowledge of rational numbers to develop understanding of irrational numbers.
- **Develop understanding of expressions and equations, including solving linear equations, linear inequalities, and systems of linear equations.**
  - Students recognize equations for proportions (y/x =m or y = mx) as special linear equations (y = mx + b) understanding that the constant of proportionality (m) is the slope, and the graphs are lines through the origin. They understand that the slope (m) of a line is a constant rate of change, so that if the input or x-coordinate changes by an amount A, the output or y-coordinate changes by the amount m – A. Students fluently solve linear equations and linear inequalities in one variable . They solve systems of two linear equations in two variables to analyze situations and solve problems. Students understand when they use properties of equality and logical equivalence, they maintain the solutions of the original equation.
- **Develop understanding of the concept of a function and use functions to describe quantitative relationships, including modeling an association in bivariate data with a linear equation.**
  - Students grasp the concept of a function as a rule that assigns to each input exactly one output. They can translate among representations and partial representations of functions (noting that tabular and graphical representations may be partial representations), and they describe how aspects of the function are reflected in the different representations. Students use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For scatter plots that suggest linear association, students informally fit a straight line and assess the model fit by judging the closeness of the data points to the line.
- **Fluently solve linear equations and inequalities in one variable.**



The GESD Pacing Guides were created by a panel of Teachers and Achievement Advisors with the additional input and guidance from Principals and Assistant Principals. The GESD Pacing Guides are revised yearly through feedback and committee work. Thank you for all input and support.

Arizona Mathematics Standards (adopted December 2016)

What the Arizona Mathematics Standards Are

The Arizona Mathematics Standards define the knowledge, understanding, and skills that need to be taught and learned so all students are ready to succeed in credit-bearing, college-entry courses and/or in the workplace. The Arizona Mathematics Standards are the foundation to guide the construction and evaluation of mathematics programs in Arizona K-12 schools and the broader Arizona community.

- Focused in coherent progressions across grades K-12
- Aligned with college and workforce expectations
- Inclusive of rigorous content and applications of knowledge through higher-order thinking
- Research- and evidence-based

Understanding in Mathematics

When a student understands a mathematical concept, they move fluidly between the concrete and abstract. There is evidence they are able to make sense of and justify mathematical connections. Evidence of understanding includes connections among:

- Verbal or written reasoning
- Pictorial representations
- Real-world application
- Procedures/Computation

Grade 8 AzM2 Math Blueprint 2016 Standards		
Reporting Category	**Min.**	**Max.**
Functions	21%	25%
Expressions & Equations	29%	33%
Geometry	17%	21%
Statistics & Probability and The Number System	19%	27%
Statistics and Probability	*4%*	*8%*
Number System	*15%*	*19%*

Within a test, approximately 70% of the assessment will be on major content within that grade or course.

Percentage of Points by Depth of Knowledge Level	
DOK 1	10% - 20%
DOK 2	60% - 70%
DOK 3	12% - 30%

Comprehensive Mathematics Block (90 minutes)

Students are developing fluency in representation, connections, reasoning & proof, problem solving, and communication of mathematics.
Math Attitude is developed and reinforced in every lesson, ensuring that students make sense of mathematics and persevere.

		Teacher Actions	Student Actions	Resources Utilized
FLUENCY (15 minutes) *Purpose: Students increase flexibility, efficiency, and accuracy in computation and procedures. Conceptual understanding and strategies are the foundations on which fluency is built.*		• Model mental math strategies • Think aloud math strategies • Question using a variety of DOK levels • Explicitly teach appropriate mathematical strategies and formulas • Provide feedback on progress	• Utilize mental math strategies • Write out strategies to show procedural knowledge • Answer a variety of DOK 1-4 questions • Share mathematical strategies and thinking • Use feedback to set goals for improvement	• Number Talks • Socratic Seminar • Turnaround Problem (answer given, students come up with the question)
WHOLE GROUP INSTRUCTION (25 minutes)	**Conceptual Understanding** *Purpose: Students develop mathematical understanding (Instructional Continuum).*	• Explicitly teach academic vocabulary • Explicitly model the thinking and strategy used • Guide students through practicing the use of the strategy and offer specific feedback • Guide students through independent practice with appropriate tools • Ask a variety of DOK 1-4 questions throughout instruction	• Use strategies to learn the academic vocabulary and use it in discussions • Utilize the appropriate strategy to solve the problem • Use feedback to redirect actions as needed • Practice the strategies and skills using the appropriate tools • Answer a variety of DOK 1-4 questions • Utilize strategies to check for reasonableness of solution (i.e. UPS-Check)	• Go Math! (K-5) • Holt Math (6-8) • Mathematical Practice standards (as appropriate for lesson)
	Problem Solving *Purpose: Students utilize mathematical knowledge to solve real-life problems and investigate mathematics.*	• Pose problem/situation • Scaffold independent practice with think-alouds • Label strategies used	• Read and understand the problem/situation • Utilize knowledge of appropriate strategies and skills to determine next steps • Label strategies used • Utilize strategies to check for reasonableness of solution (i.e. UPS-Check)	• Go Math! (K-5) • Holt Math (6-8) • Van de Walle
SMALL GROUP INSTRUCTION (40 minutes) *Purpose: Students practice mathematical skills, concepts and/or strategies with strategic support or with enrichment.*		• Identify skill gaps of students using ongoing assessments • Prompt and reinforce mathematical behaviors • Model math strategies and the flexibility to choose between strategies • Create groups by Skill, Concept, or Strategy	• Practice foundational math skills • Monitor comprehension and select strategies to increase understanding • Extend grade level understanding and link to upcoming standards	• Go Math! supplements • Holt Math supplements • Van de Walle • Do the Math • Do the Math Now
COGNITIVE CLOSURE (10 minutes) *Purpose: Students cognitively process learning in order to focus on what was learned, whether it made sense, and if it had meaning.*		• Summarize and synthesize the learning process and skills obtained • Connect the concepts, skills, or strategies to a real world application • Connect the concepts, skills, or strategies to other learning through transfer • Give an End-of-Lesson Assessment (i.e. Exit Ticket, Journal-Writing, etc.)	• Summarize and synthesize the learning process and skills obtained • Reflect on the learning process and connect the learning to a real world application • Complete an End-of-Lesson Assessment	• Exit tickets • Math Journals • Common Formative Assessments

Year-Long Standards Overview

Mathematical Practices – To be embedded into every lesson

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.

Key:
➡ **Grade-Level Guaranteed Standards**
Essential Standards
Supporting Standards
Prerequisite Understanding

Yearlong Fluency Standards – To be taught and revisited continually throughout the year

➡**8.EE.C.7** Fluently solve linear equations and inequalities in one variable.

➡**8.EE.A.2** 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. Know that $\sqrt{2}$ is irrational.

Quarter 1

Rational and Irrational
8.NS.A.1
8.NS.A.2
➡**8.NS.A.3**

Exponents
➡**8.EE.A.2** (embed 8.NS.A.1)
➡**8.EE.A.1**

One-Variable Equations and Inequalities
➡**8.EE.C.7**

Functions
8.F.A.1
➡**8.F.A.3**

Quarter 2

Linear Functions
8.EE.B.5
➡**8.F.B.4** (embed 8.F.A.2)

Graphs and Trends
(embed 8.F.B.5)
8.SP.A.1
8.SP.A.2
8.SP.A.3
(embed **8.F.B.4** & **8.EE.B.5**)

Systems of Equations
➡**8.EE.C.8**
(embed ➡**8.EE.C.7** within **8b** and **8c**)

Revisit and Embed Fluency Standards:
➡**8.EE.C.7**
➡**8.EE.A.2**

Quarter 3

Pythagorean Theorem
8.G.B.6
8.G.B.7 (embed ➡**8.EE.A.2**)
8.G.B.8

Transformations
8.G.A.1 (embed 8.G.A.2)
8.G.A.3 (embed 8.G.A.4)

Volume
8.G.C.9
(embed ➡**8.EE.A.2** & ➡**8.EE.C.7**)

Two-Way Tables
8.SP.A.4

Revisit and Embed Fluency Standards:
➡**8.EE.C.7**
➡**8.EE.A.2**

Quarter 4

Triangles
8.EE.B.6 (embed **8.EE.B.5** & ➡**8.F.B.4**)
8.G.A.5 (revisit ➡**8.EE.C.7**)

Scientific Notation
8.EE.A.3
8.EE.B.4 (embed ➡ **8.EE.A.1**)

Compound Probabilities
8.SP.B.5

Revisit and Embed Fluency Standards:
➡**8.EE.C.7**
➡**8.EE.A.2**

Use any remaining time in the year to reteach standards to which students did not reach mastery and to pre-teach Algebra I concepts through project-based learning activities.

Quarter 1			
Arizona State Standards	**GESD Suggested Learning Targets (○) AzM2 Sample Task Demands (★)**	**Curricular Resource Mathematical Practices**	**Vocabulary**
The recommended order of lessons from the Holt Book for First Quarter are: 1-1, 3-7, 3-6, Extension Pg. 128, 3-5, Lab Pg. 120, 3-2, 1-5, Lab Pg. 30, 1-6, 7-1, 7- 2, Lab Pg. 308, 7-3, Extension Pg. 314, and 2-4			
Rational and Irrational By the end of this unit of study, students will be able to understand that there are irrational numbers, and approximate them using rational numbers.			
8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion. Know that numbers whose decimal expansions do not terminate in zeros or in a repeating sequence of fixed digits are called irrational.	o Define and identify rational and irrational numbers o Convert fractions to decimals and decimals to fractions o Understand that every number has a decimal expansion ★ Identify numbers that are irrational ★ Convert a repeating decimal into a fraction ★ Explain why a number is rational or irrational	Holt: 1-1, 3-7 Mathematical Practices: 2, 6, 7 Flipbook: Pg. 4 *Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pg. 221; 10.16*	Rational number, Irrational number, Real number, Repeating decimal, Terminating decimal
8.NS.A.2 Use rational approximations of irrational numbers to compare the size of irrational numbers. Locate them approximately on a number line diagram, and estimate their values.	o Compare the size of irrational numbers using rational approximations ★ Identify the approximated value of an irrational number ★ Estimate values of expressions that include irrational values ★ Plot irrational numbers on a number line	Holt: 3-6, Extension Pg. 128 Mathematical Practices: 2, 4, 7, 8 Flipbook: Pg. 7 *Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pg. 222*	Rational number, Irrational number, Perfect square, Square root, Principal square root, Approximate, Density Property
➡8.NS.A.3 Understand that given any two distinct rational numbers, *a* < *b*, there exist a rational number *c* and an irrational number *d* such that *a* < *c* < *b* and *a* < *d* < *b*. Given any two distinct irrational numbers, *a* < *b*, there exist a rational number *c* and an irrational number *d* such that *a* < *c* < *b* and *a* < *d* < *b*.	o Understand that there are infinitely many rational numbers between any two rational numbers o Understand that there are infinitely many irrational numbers between any two rational numbers o Understand that there are infinitely many rational numbers between any two irrational numbers o Understand that there are infinitely many irrational numbers between any two irrational numbers ★ Recognize that there are rational and irrational numbers between two rational or irrational numbers. ★ Identify a rational or irrational number that has a value between two rational or irrational numbers.	Holt: *Embedded within lessons for 8.NS.A.1 and 8.NS.A.2* Mathematical Practices: 2, 4	Rational number, Irrational number, Density Property

Exponents with One-Variable Equations and Inequalities **By the end of this unit of study, students will be able to work with radicals and integer exponents then analyze and solve linear equations and inequalities.**			
➡**8.EE.A.2** (embed 8.NS.A.1) **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. Know that $\sqrt{2}$ is irrational.** **a. Evaluate square roots of perfect squares less than or equal to 225.** **b. Evaluate cube roots of perfect cubes less than or equal to 1,000.**	o Know that the square or cube root of any perfect square or cube is rational and explain why o Know that the square or cube root of any non-perfect square or cube is irrational and explain why ★ Identify a square or cube root as the solution to a quadratic or cubic equation ★ Find the value of a square or cube root ★ Solve simple square or cube root equations	Holt: 3-5, Lab Pg. 120 Mathematical Practices: 2, 5, 6, 7 Flipbook: Pg. 11 *Supplement with* *Engage NY Module 7 Lesson 3*	Square root, Perfect square, Cube root, Perfect cube, Rational, Irrational, Principal square root, Non-principal square root, Approximate
➡**8.EE.A.1** **Understand and apply the properties of integer exponents to generate equivalent numerical expressions.** *For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.*	★ Identify equivalent numerical expressions using the properties of exponents ★ Complete an equivalent expression using the properties of exponents	Holt: 3-2 Mathematical Practices: 2, 5, 6, 7 Flipbook: Pg. 8 *Supplement with* *Teaching Student-Centered Mathematics Van de Walle Pg. 201* *Engage NY Module 1 Lesson 2 Lesson 3*	Exponent, Power, Base, Coefficient Expression, Reciprocal
➡**8.EE.C.7** **Fluently solve linear equations and inequalities in one variable.** **a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. 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).** **b. Solve linear equations and inequalities with rational number coefficients, including solutions that require expanding expressions using the Distributive Property and collecting like terms.**	o Solve equations and inequalities with rational number coefficients ★ Determine the number of solutions of an equation where no simplification is required (a) ★ Determine the number of solutions of an equation where simplification is required ★ Find the solution of an equation (b) ★ Construct an equation given parameters including the solution or number of solutions (a)	Holt: 1-5, Lab Pg. 30, 1-6, 7-1, 7-2, Lab Pg. 308, 7-3, Extension Pg. 314, Mathematical Practices: 2, 5, 6, 7 Flipbook: Pg. 17 (Inequalities not included in the Flip Book) *Supplement with* *1.4 (McDougal Littell Algebra I book)*	Term, Like terms, Equivalent expressions, Simplify, Variable, Coefficient, Constant, Infinitely many solutions, No solution, Linear equation, Distributive Property, Inequalities
Functions **By the end of this unit of study, students will be able to define, evaluate, and compare functions.**			
8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a	o Define a function ★ Identify a function or a relation that is not a function, in table or graph form	Holt: 2-4 Mathematical Practices: 2, 6 Flipbook: Pg. 24	Relation, Function, Domain, Range, Independent variable,

function is the set of ordered pairs consisting of an input and the corresponding output. (Function notation is not required in Grade 8.)	★ Create or complete a function or a relation that is not a function in table or graph form (item requires student to show both a function and a non-function) ★ Identify a graph of a function given a rule	*Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pg. 267*	Dependent variable, Vertical line test, Input, Output
➡8.F.A.3 **Interpret the equation *y* = m*x* + b as defining a linear function whose graph is a straight line; give examples of functions that are not linear.** ***For example, the function A = s^2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1, 1), (2, 4), and (3, 9), which are not on a straight line.***	o Explain the characteristics of linear functions in tables, equations, and graphs ★ Categorize functions represented as equations or graphs as linear or nonlinear ★ Categorize functions represented as tables as linear or nonlinear	Mathematical Practices: 2, 4, 5, 6, 7 Flipbook: Pg. 28 *Supplement with* *Connected Mathematics Thinking with Math Models* *Engage NY Module 5 Lessons 6 and 8*	Linear Function, Nonlinear function, Slope-Intercept form, Slope, *y*-intercept, Axis/Axes, Origin
Quarter 2			
Arizona State Standards	**GESD Suggested Learning Targets (○) AzM2 Sample Task Demands (★)**	**Curricular Resource Mathematical Practices**	**Vocabulary**
The recommended order of lessons from the Holt book for Second Quarter are: 8-2, 8-3, 8-4, 2-5, 9-3, 9-4, 2-3, 8-1, 8-5, 9-1, Lab Pg. 394, 9-2, 7-4, and 8-6.			
Fluency Standards to Revisit and Embed			
➡**8.EE.C.7** Fluently solve linear equations and inequalities in one variable.			
➡**8.EE.A.2** 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. Know that $\sqrt{2}$ is irrational.			
Linear Functions & Graph and Trends **By the end of this unit of study, students will be able to define, evaluate, and compare functions, use functions to model relationships between quantities, understand the connections between proportional relationships, lines, and linear equations, and investigate patterns of association in bivariate data.**			
8.EE.B.5 **Graph proportional relationships interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.** *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*	o Calculate, interpret, and graph unit rates ★ Calculate unit rate given a graph of a proportional relationship ★ Graph proportional relationships, including comparisons to other proportional relationships ★ Compare two proportional relationships represented in two different ways ★ Create a proportional relationship based on a comparison with another proportional relationship in a different representation	Holt: 8-2 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 14	Unit rate, Slope, Proportional relationship, Time-distance graph
➡**8.F.B.4** (embed 8.F.A.2) **Given a description of a situation, generate a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a**	o Identify and interpret slope and *y*-intercept o Know that the initial value corresponds with the *y*-intercept	Holt: 8-3, 8-4 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8	*x*-intercept, *y*-intercept, Slope, Slope-intercept form, Point-slope form, Rate of change, Initial value, Linear

description of a relationship or from two *(x, y)* values, including reading these from a table or a graph. Track how the values of the two quantities change together. Interpret the rate of change and initial value of a linear function in terms of the situation it models, its graph, or its table of values.	★ Determine the rate of change and/or initial value of a linear function from an equation (context is allowed) ★ Interpret the rate of change and initial value of a linear function in terms of its context (context is required) ★ Create a linear equation by interpreting a table, a graph, a description, or two ordered pairs of the function (context is allowed) ★ Determine the rate of change and/or initial value of a linear function from a table, a graph, a description, or two ordered pairs of the function (context is allowed) ★ Create a linear equation, graph, or table that has a different rate of change and/or initial value when compared with a given function (context is allowed)	Flipbook: Pg. 29 *Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pgs. 256, 293* *Engage NY Module 5 Lessons 1 and 5, Module 6 Lessons 1, 2, and 3*	function, Axis/Axes, Origin, Standard Form
8.F.A.2 (embed within ➡**8.F.B.4**) Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*	o Identify the slope and *y*-intercept of functions using tables, graphs, equations, and verbal descriptions ★ Identify correct statement(s) comparing properties of two functions presented using different representations ★ Identify a linear function that has certain properties when compared with a given function	Holt: 2-5, 9-3, 9-4 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 26 *Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pgs. 265, 269*	Continuous function, Discrete function, Linear function, Slope, *y*-intercept, Rate of change, Initial value, Axis/Axes, Origin
8.F.B.5 (embed within SP standards) Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	o Analyze and describe the relationship of a graph with and without context ★ Identify a qualitative description given a graph, or a graph given a qualitative description, with no context (context is not allowed) ★ Identify a qualitative description given a graph, or a graph given a qualitative description, within a context (context is allowed) ★ Construct the graph of a function that matches a given qualitative description (context is required)	Holt: 2-3, 8-1, 8-5 Mathematical Practices: 2, 3, 4, 5, 6, 7 Flipbook: Pg. 32 *Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pgs. 271, 272*	Linear equation, Rate of change, Direct variation, Constant variation, Time-distance graph

8.SP.A.1 (embed 8.F.B.5) Construct and interpret scatter plots for bivariate measurement data to investigate and describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	★ Identify patterns of association (clusters, outliers, positive/negative association, linear/nonlinear association) for a scatter plot ★ Interpret patterns of association found in scatter plots in terms of a given context ★ Construct a scatter plot using given data points and interpret patterns therein ★ Construct scatter plots given a verbal description of the association	Holt: 9-1 Mathematical Practices: 2, 4, 5, 6, 7 Flipbook: Pg. 49 *Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pg. 386*	Scatter plot, Correlation, Line of best fit, Linear association, Nonlinear association, Bivariate data, Outlier
8.SP.A.2 (embed 8.F.B.5) Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	o Explain that straight lines are used to model relationships between two quantitative variables ★ Identify an approximate line of best fit for a given scatter plot ★ Construct an approximate line of best fit ★ Compare the accuracy of a model by how closely the data follows the line of best fit for several models	Holt: Lab Pg. 394 Mathematical Practices: 2, 4, 5, 6, 7 Flipbook: Pg. 51 *Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pg. 386* *Engage NY Module 6 Lesson 9*	Line of best fit, Scatter plot, Correlation, Linear association, Outlier
8.SP.A.3 (embed **8.F.B.4** and **8.EE.5**) **Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.** *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*	★ Interpret the slope and intercept of a line of best fit, with slope and/or intercept parameter identified, in terms of the context ★ Interpret the slope and intercept of a modeling equation in terms of the context ★ Solve problems about the slope and intercept of a line of best fit in terms of the context	Holt: 9-2 Mathematical Practices: 2, 4, 5, 6, 7 Flipbook: Pg. 52 *Supplement with* *Engage NY Module 6 Lessons 10 and 11*	Cluster, Slope, *y*-intercept, Bivariate data
Systems of Equations **By the end of this unit of study, students will be able to analyze and solve pairs of simultaneous linear equations.**			
➡**8.EE.C.8** (embed **8.EE.C.7** within **b** and **c**) **Analyze and solve pairs of simultaneous linear equations.** **a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.** **b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations**	o Describe the point of intersection between two lines as point that satisfies both equations simultaneously o Determine the number of special solutions (infinitely many or no solution) by graphing both equations ★ Identify the integer solution of a system from a graph (a) (context is not allowed) ★ Identify the number of solutions of a system by inspection given the two equations (b) (context is not allowed)	Holt: 7-4, 8-6 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 21 *Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pg. 287* *Engage NY Module 4 Lessons 26-29*	System of equations, Solution of a system of equations, Substitution, Elimination, Parallel, Intersecting but not perpendicular

including cases of no solution and infinite number of solutions. Solve simple cases by inspection. **c. Solve mathematical problems and problems in real-world context leading to two linear equations in two variables.**	★ Solve a system of two equations (b) (context is not allowed) ★ Graph a system of equations and select an interval in which the x-or y-value of the solution lies (b) (context is not allowed) ★ Solve a problem that can be modeled with a system of equations (c) (context is required)		
➡**8.EE.C.7** (embed within 8.EE.C.8) **Fluently solve linear equations and inequalities in one variable.** **a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. 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).** **b. Solve linear equations and inequalities with rational number coefficients, including solutions that require expanding expressions using the Distributive Property and collecting like terms.**	★ Determine the number of solutions of an equation where no simplification is required (a) ★ Determine the number of solutions of an equation where simplification is required ★ Find the solution of an equation (b) ★ Construct an equation given parameters including the solution or number of solutions (a)	Holt: Revisit standard within instruction on 8.EE.C.8 Mathematical Practices: 2, 5, 6, 7 Flipbook: Pg. 17 (Inequalities not included in the Flip Book.)	Term, Like terms, Equivalent expressions, Simplify, Variable, Coefficient, Constant, Infinitely many solutions, No solution, Linear equation, Distributive Property, Inequalities, Perpendicular, Coincident (same line), No solution, Infinitely many solutions

Quarter 3			
Arizona State Standards	**GESD Suggested Learning Targets (○) AzM2 Sample Task Demands (★)**	**Curricular Resource Mathematical Practices**	**Vocabulary**
The recommended order of lessons from the Holt book for Third Quarter are: Lab Pg. 131, Lab Pg. 136, 3-8, 3-9, Lab Pg.220, 5-6, Lab Pg. 174, 4-4, 5-7, 5-8, 5-5, Lab Pg. 237, Lab Pg. 168, and 4-3, Lab Pg. 266, 6-2, Lab Pg. 274, 6-3, and 6-4, 10-1 (from the Holt 7th grade book), and 10-9 (from the Holt 7th grade book).			
Fluency Standards to Revisit and Embed			
➡**8.EE.C.7** Fluently solve linear equations and inequalities in one variable.			
➡**8.EE.A.2** 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. Know that $\sqrt{2}$ is irrational.			
Pythagorean Theorem/Transformations/Volume **By the end of this unit of study, students will understand and apply the Pythagorean Theorem, understand congruence and similarity, and solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.**			
8.G.B.6 Understand the Pythagorean Theorem and its converse.	o Define Pythagorean Theorem, right triangle, legs (*a* & *b*), hypotenuse (*c*), and converse o Determine if three given side lengths create a right triangle	Holt: Lab Pg. 131, Lab Pg. 136 Mathematical Practices: 3, 4, 6, 7 Flipbook: Pg. 42 *Supplement with*	Converse, Base, Height, Proof, Leg, Hypotenuse, Pythagorean Theorem

	★ Identify components of a sufficient/insufficient proof of the Pythagorean Theorem ★ Explain or evaluate a proof of the Pythagorean Theorem	*Teaching Student-Centered Mathematics Van de Walle Pgs. 312-313*	
8.G.B.7 (embed ➡**8.EE.A.2**) **Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world context and mathematical problems in two and three dimensions.**	o Apply theorem in real life situation ★ Find missing side lengths in a right triangle (context is not allowed) ★ Solve simple real-world problems using the Pythagorean Theorem (context is required)	Holt: 3-8 Mathematical Practices: 1, 2, 4, 5, 6, 7 Flipbook: Pg. 44 *Supplement with Teaching Student-Centered Mathematics Van de Walle Pgs. 321-322 Connected Mathematics "Looking for Pythagoras"*	Pythagorean Theorem, Leg, Hypotenuse, Right triangle, Principal square root
➡**8.EE.A.2** (embed within **8.G.B.7** and **8.G.C.9**) **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. Know that $\sqrt{2}$ is irrational.** **a. Evaluate square roots of perfect squares less than or equal to 225.** **b. Evaluate cube roots of perfect cubes less than or equal to 1,000.**	o Know that the square or cube root of any perfect square or cube is rational and explain why o Know that the square or cube root of any non-perfect square or cube is irrational and explain why ★ Identify a square or cube root as the solution to a quadratic or cubic equation ★ Find the value of a square or cube root ★ Solve simple square or cube root equations	Holt: *Embed within lessons for 8.G.B.7 and 8.G.C.9* Mathematical Practices: 2, 5, 6, 7 Flipbook: Pg. 11	Square root, Perfect square, Cube root, Perfect cube, Rational, Irrational, Principal square root, Non-principal square root, Approximate
8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	o Determine how to create a right triangle from two points on a coordinate graph o Use Pythagorean Theorem to solve for distance of said two points ★ Determine the distance between two points on a coordinate grid	Holt: 3-9 Mathematical Practices: 1, 2, 4, 5, 6, 7 Flipbook: Pg. 45 *Supplement with Teaching Student-Centered Mathematics Van de Walle Pg. 334*	Pythagorean Theorem, Leg, Hypotenuse, Right triangle
8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations. Properties include: lines are taken to lines, line segments are taken to line segments of the same length, angles are taken to angles of the same measure, and parallel lines are taken to parallel lines.	o Define rotations, translations and reflections o Identify corresponding sides and angles ★ Identify congruent properties based on a transformation(s) ★ Solve a problem based on comparing part of a given shape to the corresponding part of its transformation	Holt: Lab Pg. 220, 5-6 Mathematical Practices: 4, 5, 6, 7, 8 Flipbook: Pg. 33 *Supplement with Teaching Student-Centered Mathematics Van de Walle Pgs. 324, 327*	Transformation, Image, Translation, Reflection, Rotation, Center of rotation, Rigid motion, Prime (point notation), Preimage
8.G.A.3	o Define dilation (reducing/enlarging) and identify the scale factor	Holt: Lab Pg. 174, 4-4, 5-7, 5-8	Dilation, Scale factor, Center of dilation, Similarity,

Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	★ Identify the coordinates of a figure after a given transformation ★ Given a figure and transformation, draw the image or preimage ★ Identify the transformation that has occurred given an image and a pre-image or coordinates ★ Given a point (*x*, *y*), use coordinate rules to show how that point changes after a transformation or transformations	Mathematical Practices: 3, 4, 5, 6, 7 Flipbook: Pg. 37 *Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pgs. 329, 330, 331*	Transformation, Congruence, Rotation, Reflection, Translation, Rigid motion, Image, Prime (point notation), Coordinate notation
8.G.A.2 (embed within 8.G.A.1) Understand that a two-dimensional figure is congruent to another if one can be obtained from the other by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that demonstrates congruence.	o Define congruence ★ Identify a transformation or set of transformations that maintain congruence ★ Describe a transformation given two congruent figures	Holt: 5-5, Lab Pg. 237 Mathematical Practices: 2, 4, 6, 7 Flipbook: Pg. 36 *Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pg. 327*	Correspondence, Congruent figures, Rotation, Reflection, Translation, Dilation, Transformation, Rigid motion
8.G.A.4 (embed within **8.G.A.3**) Understand that a two-dimensional figure is similar to another if, and only if, one can be obtained from the other by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that demonstrates similarity.	o Define similarity o Understand that as a figure undergoes a dilation with any number of other transformations, the figures are similar ★ Describe a transformation given two similar figures	Holt: Lab Pg. 168, 4-3 Mathematical Practices: 2, 4, 5, 6, 7 Flipbook: Pg. 39	Similar, Corresponding, Dilation, Rotation, Reflection, Translation, Transformation, Rigid motion
8.G.C.9 (embed ➡**8.EE.A.2** and ➡**8.EE.C.7**) **Understand and use formulas for volumes of cones, cylinders, and spheres and use them to solve real-world context and mathematical problems.**	o Define: cone, cylinder, sphere, radius, diameter, circumference, area, volume, Base, and height o Given the volume of a cone, cylinder, or sphere: find the radius, diameter, or height ★ Use formulas to determine the volume of a cylinder, cone, or sphere ★ Use formulas to determine the volume of composite objects composed of cylinders, cones, and/or spheres, or parts of these objects ★ Compare the volumes/heights of cones and cylinders with the same base	Holt: Lab Pg. 266, 6-2 , LLab Pg. 274, 6-3, 6-4 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 46 *Supplement with* *Teaching Student-Centered Mathematics* *Van de Walle Pgs. 346, 347*	Cone, Cylinder, Sphere, Radius, Diameter, Circumference, Hemisphere, Area, Volume, Base (face, not edge), Height, Pi
➡**8.EE.C.7** (embed within **8.G.C.9**) **Fluently solve linear equations and inequalities in one variable.**	★ Determine the number of solutions of an equation where no simplification is required (a)	Holt: Revisit standard within instruction on **8.G.C.9** Mathematical Practices: 2, 5, 6, 7	Term, Like terms, Equivalent expressions, Simplify, Variable, Coefficient, Constant, Infinitely

a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. 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). **b. Solve linear equations and inequalities with rational number coefficients, including solutions that require expanding expressions using the Distributive Property and collecting like terms.**	★ Determine the number of solutions of an equation where simplification is required ★ Find the solution of an equation (b) ★ Construct an equation given parameters including the solution or number of solutions (a)	Flipbook: Pg. 17	many solutions, No solution, Linear equation, Distributive Property, Inequalities
Two-Way Tables **By the end of this unit of study, students will investigate chance processes and develop, use, and evaluate probability models.**			
8.SP.A.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. 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 association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*	★ Interpret and/or compare values in a two-way frequency table ★ Complete a two-way table based on given frequencies or relative frequencies ★ Relate a two-way relative frequency table to whether there is an association between two variables	Holt: Extension Pg. 396 Mathematical Practices: 2, 3, 4, 5, 6, 7 Flipbook: Pg. 54	Two-way frequency table, Frequency, Relative frequency table
Quarter 4			
Arizona State Standards	**GESD Suggested Learning Targets (○) AzM2 Sample Task Demands (★)**	**Curricular Resource Mathematical Practices**	**Vocabulary**
The recommended order of lessons from the Holt book for Fourth Quarter are: Lab Pg. 343, 5-2, 5-3, Lab Pg. 212, 3-3, 3-4, Lab Pg. 109, and Extension Pg. 396.			
Fluency Standards to Revisit and Embed			
➡**8.EE.C.7** Fluently solve linear equations and inequalities in one variable.			
➡**8.EE.A.2** 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. Know that $\sqrt{2}$ is irrational.			
Triangles			

By the end of this unit of study, students will understand the connections between proportional relationships, lines, and linear equations; work with integer exponents and understand angle sum relationships and corresponding angles			
8.EE.B.6 (embed **8.EE.B.5** and **8.F.B.4**) Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane. Derive the equation *y* = m*x* for a line through the origin and the equation *y* = m*x* + b for a line intercepting the vertical axis at (0, *b*).	○ Define and identify characteristics of similar triangles ○ 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 ★ Given two points on a line, determine other points on the line ★ Given three points on a line described abstractly, determine a parameter for a fourth point on the line	Holt: Lab Pg. 343 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 16 Supplement with *Engage NY Module 4 Lesson 16*	Similar triangles, Slope, Linear function, Non-vertical line
8.EE.B.5 (embed within 8.EE.B.6) **Graph proportional relationships interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.** ***For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.***	○ Calculate, interpret, and graph unit rates ★ Calculate unit rate given a graph of a proportional relationship ★ Graph proportional relationships, including comparisons to other proportional relationships ★ Compare two proportional relationships represented in two different ways ★ Create a proportional relationship based on a comparison with another proportional relationship in a different representation	Holt: *Embed within lessons for 8.EE.B.6* Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 14	Unit rate, Slope, Proportional relationship, Time-distance graph
8.F.B.4 (embed within 8.EE.B.6) **Given a description of a situation, generate 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 a graph. Track how the values of the two quantities change together. Interpret the rate of change and initial value of a linear function in terms of the situation it models, its graph, or its table of values.**	○ Identify and interpret slope and *y*-intercept ★ Determine the rate of change and/or initial value of a linear function from an equation (context is allowed) ★ Interpret the rate of change and initial value of a linear function in terms of its context (context is required) ★ Create a linear equation by interpreting a table, a graph, a description, or two ordered pairs of the function (context is allowed) ★ Determine the rate of change and/or initial value of a linear function from a table, a graph, a description, or two ordered pairs of the function (context is allowed) ★ Create a linear equation, graph, or table that has a different rate of change and/or initial value when compared with a given function (context is allowed)	Holt: *Embed within lessons for 8.EE.B.6* Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 29	*x*-intercept, *y*-intercept, Slope, Slope-intercept form, Point-slope form, Rate of change, Initial value, Linear function, Axis/Axes, Origin

8.G.A.5 (embed ➡**8.EE.C.7**) 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. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*	○ Define and identify transversals and the angles formed by them: alternate interior/exterior, corresponding, vertical, adjacent ○ Justify the sum of interior angles equals 180 degrees and that the exterior angle of a triangle is equal to the sum of the two remote interior angles ★ Use line-drawing tool to create angles of specified measure with respect to a given angle on a triangle ★ Use the AA criteria for similar triangles ★ Create expressions that represent relationships between angles ★ Drag/arrange text options to complete an argument/reasoning about angle measures of a triangle	Holt: 5-2, 5-3, Lab Pg. 212 Mathematical Practices: 3, 4, 5, 6, 7 Flipbook: Pg. 40 Supplement with *Teaching Student-Centered Mathematics Van de Walle Pg. 349*	Parallel lines, Perpendicular lines, Transversal, Alternate interior, angles, Alternate exterior angles, Vertical angles, Corresponding angles, Supplementary angles, Congruent, Adjacent angles, Consecutive interior angles, Consecutive exterior angles, Triangle Sum Theorem, Acute, Right, and Obtuse triangles, Equilateral, Isosceles, and Scalene triangles, Triangle Inequality Theorem, Interior angles, Exterior angles, Similar triangles, Angle-Angle Similarity Postulate
➡**8.EE.C.7** (embed within 8.G.A.5) **Fluently solve linear equations and inequalities in one variable.** **a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. 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).** **b. Solve linear equations and inequalities with rational number coefficients, including solutions that require expanding expressions using the Distributive Property and collecting like terms.**	★ Determine the number of solutions of an equation where no simplification is required (a) ★ Determine the number of solutions of an equation where simplification is required ★ Find the solution of an equation (b) ★ Construct an equation given parameters including the solution or number of solutions (a)	Holt: *Embed within lessons for 8.G.A.5* Mathematical Practices: 2, 5, 6, 7 Flipbook: Pg. 36	Term, Like terms, Equivalent expressions, Simplify , Variable, Coefficient, Constant, Infinitely many solutions, No solution, Linear equation, Inequalities, Distributive Property
Scientific Notations **By the end of this unit of study, students will be able to convert between standard form and scientific notation.**			
➡8.EE.A.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate	○ Define scientific notation and use it to estimate very large and/or very small quantities ★ Convert between standard form and scientific notation	Holt: 3-3 Mathematical Practices: 2, 5, 6 Flipbook: Pg. 12	Scientific notation, Exponent, Power, Base

very large or very small quantities, and express how many greater or less one is than the other.	★ Compare the magnitudes of different quantities given in scientific notation	Supplement with: *Teaching Student-Centered Mathematics* *Van de Walle Pg. 204* *Engage NY Module 1 Lesson 13*	
8.EE.A.4 (embed ➡**8.EE.A.1**) Perform operations with numbers expressed in scientific notation including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities.	○ Choose appropriate units of measure when using scientific notation ★ Convert between standard form and scientific notation ★ Perform operations with numbers expressed in scientific notation	Holt: 3-4, Lab Pg. 109 Mathematical Practices: 2, 5, 6 Flipbook: Pg. 13 Supplement with *Teaching Student-Centered Mathematics* *Van de Walle Pgs. 203, 204*	Scientific notation, Exponent, Power, Base
➡**8.EE.A.1** (embed within 8.EE.A.4) **Understand and apply the properties of integer exponents to generate equivalent numerical expressions.**	★ Identify equivalent numerical expressions using the properties of exponents ★ Complete an equivalent expression using the properties of exponents	Holt: *Embed within lessons for 8.EE.B.4* Mathematical Practices: 5, 6, 7 Flipbook: Pg. 8	Exponent, Power, Base, Coefficient, Expression, Reciprocal
Compound Probabilities **By the end of this unit of study, students will determine the probability of a compound event.**			
8.SP.B.5 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using organized lists, tables, tree diagrams, and other methods. Identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events.	○ Identify the outcomes in the sample space for an everyday event ○ Find the probabilities of compound events using organized lists, tables, tree diagrams, etc. and analyze the outcomes ○ Design and use a simulation to generate frequencies for compound events ★ Identify the sample space for a compound event given an experimental design or a context ★ Determine the probability of a compound event	Holt: 10-1 (Holt 7th grade Mathematics book) 10-9 (Holt 7th grade Mathematics book) Mathematical Practices: 1, 2, 4, 5, 7, 8 Flipbook: Pg. 63 of the 7th grade Flip Book Supplement with *Teaching Student-Centered Mathematics* *Van de Walle Pgs. 402, 415, 416, 417, 419, 421, 422*	Sample space, Fundamental Counting Principle, Theoretical probability, Equally likely, Fair, Prediction, Independent events, Dependent events, Combination, Permutation, Factorial, Probability

Quarter Taught				**Essential Standards (➡Grade Level Guaranteed Standards)**
1	2	3	4	Expressions and Equations (EE):
X			X	➡**8.EE.A.1** – Understand and apply the properties of integer exponents to generate equivalent numerical expressions.
X		X		➡**8.EE.A.2** – 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. Know that $\sqrt{2}$ is irrational. a. Evaluate square roots of perfect squares less than or equal to 225. b. Evaluate cube roots of perfect cubes less than or equal to 1000.
	X		X	**8.EE.B.5** – Graph proportional relationships interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*
X		X	X	➡**8.EE.C.7** – Fluently solve linear equations and inequalities in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. 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). b. Solve linear equations and inequalities with rational number coefficients, including solutions that require expanding expressions using the distributive property and collecting like terms.
		X		➡**8.EE.C.8** – Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations including cases of no solution and infinite number of solutions. Solve simple cases by inspection. c. Solve mathematical problems and problems in real-world context leading to two linear equations in two variables.
				The Number System (NS):
X				8.NS.A.3 – Understand that given any two distinct rational numbers, a < b, there exist a rational number c and an irrational number d such that a < c < b and a < d < b. Given any two distinct irrational numbers, a < b, there exist a rational number c and an irrational number d such that a < c < b and a < d < b.
				Functions (F):
X	X			➡8.F.A.3 – Interpret the equation y = mx + b as defining a linear function whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4), and (3,9) which are not on a straight line.
X	X		X	➡**8.F.B.4** – Given a description of a situation, generate 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 a graph. Track how the values of the two quantities change together. Interpret the rate of change and initial value of a linear function in terms of the situation it models, its graph, or its table of values.
				Geometry (G):
	X			**8.G.A.3 –** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
		X		**8.G.B.7 –** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world context and mathematical problems in two and three dimensions.
		X		**8.G.C.9 –** Understand and use formulas for volumes of cones, cylinders and spheres and use them to solve real-world context and mathematical problems.
				Statistics and Probability (SP):
	X			**8.SP.A.3 –** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.

Quarter Taught				**Supporting Standards**
1	2	3	4	The Number System (NS):
X				8.NS.A.1 – Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion. Know that numbers whose decimal expansions do not terminate in zeros or in a repeating sequence of fixed digits are called irrational.
X				8.NS.A.2 – Use rational approximations of irrational numbers to compare the size of irrational numbers. Locate them approximately on a number line diagram, and estimate their values.
				Expressions and Equations (EE):
			X	➡8.EE.A.3 – 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 express how many times larger or smaller one is than the other.
			X	8.EE.A.4 – Perform operations with numbers expressed in scientific notation including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities.
			X	8.EE.B.6 – Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane. Derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at (0, *b*).
				Functions (F):
X				8.F.A.1 – Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. (Function notation is not required in Grade 8.)
X	X			8.F.A.2 – Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*
	X			8.F.B.5 – Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
				Geometry (G):
	X			8.G.A.1 – Verify experimentally the properties of rotations, reflections, and translations. Properties include: lines are taken to lines, line segments are taken to line segments of the same length, angles are taken to angles of the same measure, parallel lines are taken to parallel lines.
	X			8.G.A.2 – Understand that a two-dimensional figure is congruent to another if one can be obtained from the other by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that demonstrates congruence.
	X			8.G.A.4 – Understand that a two-dimensional figure is similar to another if, and only if, one can be obtained from the other by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that demonstrates similarity.
			X	8.G.A.5 – 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. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*
		X		8.G.B.6 – Understand the Pythagorean Theorem and its converse.
		X		8.G.B.8 – Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
				Statistics and Probability (SP):
	X			8.SP.A.1 – Construct and interpret scatter plots for bivariate measurement data to investigate and describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
	X			8.SP.A.2 – Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.

		X		8.SP.A.4 – Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. 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 association between the two variables.
			X	8.SP.B.5 – Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using organized lists, tables, tree diagrams and other methods. Identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events.