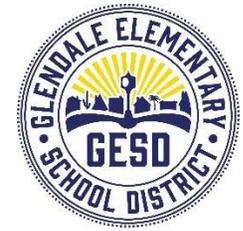Glendale Elementary School District
Mathematics Pacing Guide
2020-2021

7ᵗʰ Grade

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

➢ **Develop understanding of proportional relationships.**
  ○ Students extend their understanding of ratios and rates to develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line. They distinguish proportional relationships as the foundation for rate of change.

➢ **Develop understanding of operations with rational numbers and work with expressions, inequalities, and linear equations.**
  ○ Students develop a unified understanding of numbers by recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. Students can use variables to represent quantities and construct simple equations and inequalities to solve problems. Students fluently solve one variable equations of the forms $px + q = r$ and $p(x + q) = r$

➢ **Apply properties of operations as strategies to add and subtract rational numbers.**

➢ **Apply properties of operations as strategies to multiply and divide rational numbers.**
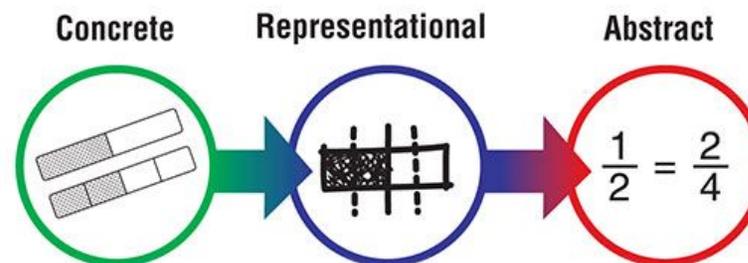
The GESD Pacing Guides were created by a panel of Teachers and Achievement Advisors with the additional input and guidance from Principals and Assistant Principals. The GESD Pacing Guides are revised yearly through feedback and committee work. Thank you for all input and support.

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 7 AzM2 Math Blueprint 2016 Standards

Reporting Category	Min.	Max.
Ratios & Proportions	19%	23%
The Number System	19%	23%
Expressions & Equations	23%	27%
Geometry and Statistics & Probability	27%	35%
Geometry	15%	19%
Statistics and Probability	12%	16%

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 Previously Presented Materials

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

➡**7.EE.B.4** – Use variables to represent quantities in mathematical problems and problems in real-world context, and construct simple equations and inequalities to solve problems.

7.NS.A.3 – Solve mathematical problems and problems in real-world context involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions where $a/b \div c/d$ when a, b, c, and d are all integers and b, c, and $d \neq 0$.

Quarter 1	Quarter 2	Quarter 3	Quarter 4
Applying Properties and Operations of Rational Numbers ➡**7.NS.A.1** (embed 7.NS.A.3) ➡**7.NS.A.2** (embed 7.NS.A.3) **Expressions, Equations, & Inequalities with Rational Numbers** **7.EE.A.1** **7.EE.A.2** ➡**7.EE.B.4**	**Ratios and Proportions** ➡**7.RP.A.1** ➡**7.RP.A.2** (embed 7.G.A.1) **Expressions, Equations, & Inequalities with Rational Numbers** **7.EE.B.3** (embed 7.G.B.5) 7.G.B.6 (embed 7.NS.A.3) **Revisit and Embed Fluency Standards:** ➡**7.EE.B.4** 7.NS.A.3	**Geometry** 7.G.A.2 7.G.A.3 **7.G.B.4** (embed 7.NS.A.3) **Data Distributions** 7.SP.B.3 **7.SP.B.4** **Ratios and Proportions** ➡**7.RP.A.3** (embed 7.NS.A.3) **Revisit and Embed Fluency Standards:** ➡**7.EE.B.4** 7.NS.A.3	**Probability** 7.SP.A.1 7.SP.A.2 7.SP.C.5 7.SP.C.6 7.SP.C.7 **Revisit and Embed Fluency Standards:** ➡**7.EE.B.4** 7.NS.A.3 Use any remaining time in the year to reteach standards to which students did not reach mastery and to pre-teach 8th grade 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: Lab Pg. 334, 8-5, Lab Pg. 342, 1-1, 1-2, 1-3, 2-1, Lab Pg. 50, 2-2, Extension Pg. 56, Lab Pg. 58, 2-3, 3-1, 3-5, Lab Pg. 64, 2-4, 3-2, 3-3, 3-6, 3-7, 2-6, 2-7, Real-World Pg. 87, 1-5, Problem Solving pg. 117, Real World pg. 135, 1-4, 6-3, 6-4, 6-5, 6-6.			
Applying Properties and Operations and Rational Numbers **By the end of this unit of study, students will be able to apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.**			
➡**7.NS.A.1** (embed 7.NS.A.3) **Add and subtract integers and other rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.** **a. Describe situations in which opposite quantities combine to make 0.** **b. Understand $p + q$ as the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world context.** **c. Understand subtraction of rational numbers as adding the additive inverse, $p – q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world context.** **d. Apply properties of operations as strategies to add and subtract rational numbers.**	○ Apply and extend previous understanding to represent addition and subtraction problems of rational numbers with a horizontal or vertical number line ○ Interpret sums of rational numbers by describing real-world contexts ○ Explain and justify why the sum of $p + q$ is located a distance of $|q|$ in the positive or negative direction from p on a number line ○ Represent the distance between two rational numbers on a number line as the absolute value of their difference and apply this principle in real-world contexts ○ Apply the principle of subtracting rational numbers in real-world contexts ○ Demonstrate and explain how adding two numbers, $p + q$, if q is positive, the sum of p and q will be $|q|$ spaces to the right of p on the number line ○ Demonstrate and explain how adding two numbers, $p + q$, if q is negative, the sum of p and q will be $|q|$ spaces to the left of p on the number line ★ Calculate the sum of a number and its opposite (b) ★ Calculate the distance between two points on a number line (b or c) ★ Identify the location of a point that is a specified distance from another point on a number line (b or c) ★ Find the sum or difference of two rational numbers (d)	Holt: 1-1, 1-2, 1-3,2-1, Lab Pg. 50, 2-2, Extension Pg. 56, Lab Pg. 58, 2-3, 3-1, 3-5 Mathematical Practices: 2, 4, 7 Flipbook: Pg. 13	Numerical expression, Order of Operations, Commutative Property, Associative Property, Identity Property, Distributive Property, Variable, Constant, Algebraic expression, Evaluate, Opposite, Additive inverse, Integer, Absolute value

	★ Model each step of a multi-part addition/subtraction expression on number lines, and identify the value of the expression (b or c) ★ Identify properties of values given a number line or calculation, using variables rather than actual numbers (b or c)		

➡️**7.NS.A.2** (embed 7.NS.A.3)
Multiply and divide integers and other rational numbers.
  a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the Distributive Property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world context.
  b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If *p* and *q* are integers, then -(*p/q*) = (-*p*)/*q* = *p*/(-*q*). Interpret quotients of rational numbers by describing real-world context.
  c. Apply properties of operations as strategies to multiply and divide rational numbers.
  d. Convert a rational number to decimal form using long division; know that the decimal form of a rational number terminates in 0's or eventually repeats.
	o Apply the properties of operations, particularly the Distributive Property, to multiply rational numbers
	o Interpret the products of rational numbers by describing real-world contexts
	o Apply properties of operations as strategies to multiply and divide rational numbers
	★ Convert a rational number to a decimal
	★ Determine a product or quotient given an expression or real-world situation
	★ Identify properties of values given a number line or calculation, using variables rather than actual numbers
		Holt: Lab Pg. 64, 2-4, 3-2, 3-3, 3-6, 3-7
		Mathematical Practices: 2, 4, 7
		Flipbook: Pg. 16
			Reciprocal, Multiplicative inverse, Order of Operations, Commutative Property, Associative Property, Distributive Property, Identity Property, Divisor, Integer

7.NS.A.3 (embed within **7.NS.A.1**, **7.NS.A.2**, & **7.RP.A.3**) Solve mathematical problems and problems in real-world context involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions where *a/b* ÷ *c/d* when *a*, *b*, *c*, and *d* are all integers and *b*, *c*, and *d* ≠ 0.	★ Solve simple problems involving rational numbers given a scenario ★ Solve complex problems involving rational numbers given a scenario	Holt: 2-6, 2-7, Real-World Pg. 87 Mathematical Practices: 1, 2, 5, 6, 7, 8 Flipbook: Pg. 19	Terminating decimal, Repeating decimal, Rational number

Expressions, Equations, & Inequalities with Rational Numbers
By the end of this unit of study, students will be able to use properties of operations to generate equivalent expressions then solve real-life and mathematical problems using numerical and algebraic expressions and equations.

6

7.EE.A.1 **Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.**	o Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients o Combine like terms with rational coefficients o Factor and expand linear expressions with rational coefficients using the Distributive Property ★Perform operations to construct equivalent expressions	Holt: 1-5, Prob Solv Pg. 117, Real-World Pg. 135 Mathematical Practices: 2, 6, 7 Flipbook: Pg.23 *Supplement with* *Engage NY, Module 3 Lesson 1*	Variable, Constant, Algebraic expression, Evaluate, Term, Like terms, Coefficient, Order of operations, Commutative Property, Associative Property, Distributive, Property, Identity Property, Greatest common factor, Reciprocal, Multiplicative inverse
7.EE.A.2 **Rewrite an expression in different forms, and understand the relationship between the different forms and their meanings in a problem context.** *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*	o Write equivalent expressions with fractions, decimals, percentages, and integers ★Given an expression within a context, identify an equivalent expression that shows a feature of that context ★Given a context and an expression with different values than given in the context, interpret part of the expression that is not found in the context	Holt: 1-4, 6-3 Mathematical Practices: 2, 6, 7, 8 Flipbook: Pg. 2 *Supplement with* *Teaching Student- Centered Mathematics,Van de Walle, Pg. 287 12.18, Pg. 289 12.19, Pg. 293 12.20* *Strategies for Success: Problem Solving Grade 7 Pgs. 32-50, Pgs. 72-90* *Engage NY Module 3*	Distributive Property, Order of Operations, Distributive Property, Associative Property, Commutative Property, Identity Property, Like-terms, Variable, Constant, Coefficient
➡️**7.EE.B.4** **Use variables to represent quantities in mathematical problems and problems in real-world context, and construct simple equations and inequalities to solve problems.** a. **Solve word problems leading to equations of the form $px+q = r$ and $p(x+q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.** b. **Solve word problems leading to inequalities of the form $px+q > r$ or $px+q < r$, where p, q, and r are rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.**	o Compare an algebraic solution to an arithmetic solution by identifying the sequence of the operations used in each approach o Interpret the solution set of an inequality in the context of the problem o Solve word problems leading to inequalities of the form $px + q < r$, where p, q, and r are specific rational numbers o Identify the sequence of operations used to solve an algebraic equation of form $px + q = r$ and $p(x + q) = r$ o Use variables and construct equations to represent quantities of the form $px + q = r$ and $p(x + q) = r$ from real-world and mathematical problems	Holt: 2-5, 3-4, 3-8, 11-2, 11-3, Extension Pg. 480, Prob Solv Pg. 483, Inequalities: 11-4, 11-5, 11-6, 11-7 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 30 *Supplement with* *Teaching Student-Centered Mathematics Van de Walle Pg. 267 12.7, Pg. 269 12.8, Pg.280 12.12, Pg. 286 12.17* *Strategies for Success – Problem Solving Grade 7 Pgs. 32-50, Pgs. 72-90* *Connected Mathematics:"Moving Straight Ahead" Investigation 4*	Equation, Inverse operation, Solve Inequality, Algebraic inequality, Solution set, Compound inequality, Order of Operations, Distributive Property, Associative Property, Commutative Property, Inverse Property, Variables

	o Graph the solution set of the inequality of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers o Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers o Fluently solve equations of the form $px + q = r$ and $p(x + q) = r$ with speed and accuracy ★ Solve an equation or inequality for an unknown value, without context (a, b) ★ Create an equation or inequality that models the situation, and then find the solution (a, b) ★ Construct an algebraic equation or inequality that models a word problem (a, b) ★ Graph the solution set of an inequality (b) ★ Interpret the solution set of an inequality in the context of the problem (b)		

Quarter 2

Arizona State Standards	GESD Suggested Learning Targets (O) AzM2 Sample Task Demands (★)	Curricular Resource Mathematical Practices	Vocabulary
The recommended order of lessons from the Holt book for Second Quarter are: 6-1, 6-2, 2-5, 3-4, 3-8, 11-2, 11-3, Extension Pg. 480, Problem Solving Pg. 483, 11-4, 11-5, 11-6, 11-7, 8-1, 8-2, Lab Pg. 320, 8-3, 8-4, Lab Pg. 358, 9-1, 9-2, 9-3, Problem Solving Pg. 373, 9-4, Lab Pg. 380, 9-5, Lab Pg. 386, 9-6, Extension Pg. 378, 4-1, 4-2, Lab Pg. 204, and 5-3.			
Fluency Standards to Revisit and Embed			
➡ **7.EE.B.4** – Use variables to represent quantities in mathematical problems and problems in real-world context, and construct simple equations and inequalities to solve problems.			
7.NS.A.3 – Solve mathematical problems and problems in real-world context involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions where $a/b \div c/d$ when a, b, c, and d are all integers and b, c, and $d \neq 0$.			
Ratios and Proportions			
By the end of this unit of study, students will be able to analyze proportional relationships and use them to solve real-world and mathematical problems, pages 12-15.			
7.RP.A.1 **Compute unit rates associated with ratios involving both simple and complex fractions, including ratios of quantities measured in like or different units.**	o Compute unit rates associated with ratios of fractions in like- or different-units ★ Find a unit rate for a given ratio from information within a situational context, table or mathematical problem	Holt: Lab page 204, 5-3 Mathematical Practices: 2, 6 Flipbook: Pg 5 *Supplement with* *Teaching Student Centered Mathematics Van De Walle Pg. 244 11.11, Pg. 245 11.12, Pg. 247 11.14* *Strategies for Success: Math Problem Solving Grade 7, Pgs. 52-70*	Slope, Rate of Change, Unit Rate, Ratio, Compute

		About Teaching Mathematics A K-8 resource, 3rd Edition Marilyn Burns Pg. 238-252	
7.RP.A.2 (embed 7.G.A.1) **Recognize and represent proportional relationships between quantities.** a. **Decide whether two quantities are in a proportional relationship (e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin).** b. **Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.** c. **Represent proportional relationships by equations.** *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* d. **Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.**	o Explain that a proportion is a statement of equality between two ratios o Define a constant of proportionality as a unit rate ★Recognize a proportional relationship within a representation (description, graph, table, etc.) (a) ★Identify the unit rate in a proportional relationship, given a description, graph with (1, r) plotted, equation, or table of equivalent ratios (b) ★Identify equivalent proportional relationship across representations (d) ★Solve real-world problems involving a proportional relationship, given an equation or graph (c, d) ★Create an equation to represent a proportional relationship; in some cases, also apply the equation to the situation (c) ★Explain the points (0,0) and (1,r) and their significance in a graph of a proportional relationship, where r is the unit rate (d)	Holt: 4-3, Prob Solv Pg. 163, 4-4, 5-1, 5-2, 5-4 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 6 *Supplement with Connected Mathematics "Linear Relationships" ,"Investigation 5*	Unit rate, Equivalent ratios, Proportion, Cross-product, Coordinate plane, x-axis, y-axis, Origin, Quadrant, Ordered pair, Constant of variation, Proportionality, Multiplicative comparison
7.G.A.1 (embed within **7.RP.A.2**) Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	o Use ratios and proportions to create a scale drawing o Solve problems involving scale drawings of geometric figures using scale factors o Compute lengths and areas from scale drawings using strategies such as proportions o Reproduce a scale drawing that is proportional to a given geometric figure using a different scale ★Find the length of a side or measure of area/perimeter given a shape and a scale factor ★Find the scale factor given two figures where one is a scale drawing of the other	Holt: 4-5, 4-6, Lab Pg. 176, Lab Pg. 178 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 33 *Supplement with Connected Mathematics "Number and Operations" Investigation 4*	Indirect Measurement, Scale Drawing, Scale factor, Scale model, Scale

	★ Draw a scale model given a shape and a scale factor ★ Determine a scale factor and create a scale model based on given parameters		
Expressions, Equations, & Inequalities with Rational Numbers			
By the end of this unit of study, students will be able to use properties of operations to generate equivalent expressions, solve real-life and mathematical problems using numerical and algebraic expressions and equations involving angle measure, area, surface area, and volume.			
7.EE.B.3 (embed 7.G.B.5) **Solve multi-step mathematical problems and problems in real-world context posed with positive and negative rational numbers in any form. Convert between forms as appropriate and assess the reasonableness of answers.** *For example, if a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50 per hour.*	o Apply properties of operations to calculate with numbers in any form o Convert between numerical forms, as appropriate o Solve multi-step, real-life, and mathematical problems posed with positive and negative rational numbers in any form ★ Solve a problem where only the information needed is given ★ Choose which value is reasonable based on estimation ★ Solve a problem where extra information not needed to find the solution is given	Holt: 6-1, 6-2 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 *Supplement with* *Strategies for Success: Math Problem Solving* Grade 7 Pgs. 32-50, Pgs. 72-90 *About Teaching Mathematics: A K-8 Resource*, *3rd Edition* Marilyn Burns Pg. 292-300 *Engage NY* Module 3 Lesson 4	Convert, Estimate, Percent, Simple percent, Order of Operations, Commutative Property, Associative Property, Distributive Property, Inverse Property, Inverse operations
7.G.B.5 (embed within 7.EE.B.3) Use facts about supplementary, complementary, vertical, and adjacent angles in multi-step problems to write and solve simple equations for an unknown angle in a figure.	o Determine unknown angle measures by writing and solving algebraic equations based on relationships between angles o Create an equation to determine unknown angle measurements o Determine relationship between given angles ★ Find the unknown measure of a supplementary, complementary, vertical, or adjacent angle ★ Create an expression that can be used to find an unknown angle measurement	Holt: 8-1, 8-2, Lab Pg. 320, 8-3, 8-4 Mathematical Practices: 3, 4, 5, 6, 7 Flipbook: Pg. 44	Point, Line, Plane, Ray, Line segment, Congruent, Complementary angles, Supplementary angles, Perpendicular lines, Parallel lines, Skew lines, Adjacent angles, Vertical angles, Transversal, Intersecting, Diagonal
7.G.B.6 (embed 7.NS.A.3) Solve mathematical problems and problems in a real-world context involving area of two-dimensional objects composed of triangles, quadrilaterals, and other polygons. Solve mathematical problems and problems in real-world context involving volume and surface area of three-dimensional objects composed of cubes and right prisms.	o Solve real-world and mathematical problems involving area, surface area, and volume of 2-D and 3-D objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms ★ Find the volume or surface area of an object ★ Find dimensions when the area, surface area, or volume is given ★ Find the volume of a cube given the surface area (Area of each face is limited to 100 square units)	Holt: 9-3, Prob Solv Pg. 373, 9-4, Lab Pg. 380, 9-5, Lab Pg. 386, 9-6 Mathematical Practices: 1, 2, 3, 4, 5, 6 Flipbook: Pg. 46	Composite figure, Area, Face, Edge, Vertex, Base, Prism, Pyramid, Cylinder, Cone, Sphere, Polyhedron, Volume, Height, Net, Surface area, Lateral face, Lateral area

	★Find the volume of an object composed of two objects		
Quarter 3			
Arizona State Standards	**GESD Suggested Learning Targets (O)** **AzM2 Sample Task Demands (★)**	**Curricular Resource** **Mathematical Practices**	**Vocabulary**
The recommended order of lessons from the Holt book for Third Quarter are: 4-3, Problem Solving Pg. 163, 4-4, 4-5, 4-6, Lab Pg. 176, Lab Pg. 178, 5-1, 5-2, 5-4, 7-3, Real World Pg. 295, Lab Pg. 290, 7-1, 7-2, Lab Pg. 284, Lab Pg. 292, and 10-1.			
Fluency Standards to Revisit and Embed			
➡**7.EE.B.4** – Use variables to represent quantities in mathematical problems and problems in real-world context, and construct simple equations and inequalities to solve problems.			
7.NS.A.3 – Solve mathematical problems and problems in real-world context involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions where $a/b \div c/d$ when a, b, c, and d are all integers and b, c, and $d \neq 0$.			
Geometry **By the end of this unit of study, students will draw, construct, and describe geometrical figures and describe the relationships between them.**			
7.G.A.2 Draw geometric shapes with given conditions using a variety of methods. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	o Analyze given conditions, based on the three measures of angles or sides of a triangle, to determine when there is a unique triangle, more than one triangle, or no triangle o Construct triangles from three given angle measures to determine when there is a unique triangle, more than one triangle, or no triangle o Construct triangles from three given side measures to determine when there is a unique triangle, more than one triangle, or no triangle ★Draw a figure based on given conditions ★Select appropriate side lengths that will determine a triangle	Holt: Lab Pg. 334, 8-5, Lab Pg. 342 Mathematical Practices: 4, 5, 6, 7, 8 Flipbook: Pg. 36 *Supplement with* *Engage NY Module 6 Lessons 5, 8, 11*	Angle, Vertex, Right angle, Acute angle, Obtuse angle, Straight angle, Complementary angles, Supplementary angles, Side-Side-Side Rule (SSS), Congruent, Polygon
7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures.	★Match a two-dimensional cross section with its (possible) 3-D figure(s) ★Draw a two-dimensional figure that represents the cross section of a 3-D figure	Holt: Extension Pg. 378 Mathematical Practices: 2, 4, 5, 7 Flipbook: Pg. 39	Cross-section
7.G.B.4 (embed 7.NS.A.3) **Understand and use the formulas for the area and circumference of a circle to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.**	o Justify that pi (n) can be derived from the diameter and circumference of a circle o Apply circumference or area formulas to solve mathematical and real-world problems o Justify the formulas for area and circumference of a circle and how they relate to pi (n)	Holt: Lab Pg. 358, 9-1, 9-2 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 41	Perimeter, Circumference, Pi (π), Radius, Diameter, Area

	o Informally derive the relationship between circumference and area of a circle o Given the circumference of a circle, find its area o Given the area of a circle, find its circumference ★ Find the area of a circle given diameter or radius ★ Find the radius or diameter of a circle given the circumference ★ Find circumference given the radius or diameter ★ Find the area of shapes created by the intersection of circles and other shapes ★ Find the area given the circumference		
Data Distributions			
By the end of this unit of study, students will be able to use random sampling to draw inferences about a population, draw informal comparative inferences about two populations, and investigate chance processes and develop, use, and evaluate probability models.			
7.SP.B.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*	o Compare two numerical data distributions on a graph by visually comparing data displays o Compare the differences in the measure of central tendency in two data distributions by measuring the difference between the centers ★ Given sets of data displays that represent data distributions, select the set that shows the most visual overlap ★ Given two data displays with different centers but the same variability, compute the difference in centers in terms of the mean absolute deviation and informally assess the degree of overlap	Holt: Lab Pg. 292 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7 Flipbook: Pg. 52 *Supplement with* *McDougal-Littell Algebra 6.6, 6.7* *Engage NY Module 5 Lesson 21*	Visual overlap, Measure of central tendency, Measures of variability, Upper-extreme, Maximum, Lower-extreme, Minimum, Inter-quartile range, Mean absolute deviation
7.SP.B.4 **Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.** *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*	o Analyze and interpret data using measures of central tendency and variability o Draw informal comparative inferences about two populations from random samples ★ Evaluate data displays or measures regarding evidence (center and variation, based on overlap of the data) that the data for one population is greater than another	Holt: 7-1, 7-2, Lab pg. 284 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7 Flipbook: Pg. 55 *Supplement with* *Engage NY Module 5 Lessons 22, 23*	Mean, Median, Mode, Range, Outlier, Box-and-Whisker plot, Lower quartile, Upper quartile, Histogram, Dot plot, Interquartile range
Ratios and Proportions			

By the end of this unit of study, students will be able to analyze proportional relationships and use them to solve real-world and mathematical problems, pages 12-15.			
➡️**7.RP.A.3** (embed 7.NS.A.3) **Use proportional relationships to solve multi-step ratio and percent problems (e.g., simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, and percent error).**	★Calculate the solution for percent and ratio problems ★Create an expression that can be used to find a specified percent or percentage increase/decrease of a given whole ★Use percent increase or decrease to find two quantities given their relationship in a real world context ★Interpret a proportional pattern from percent increase/decrease problems as a graph or as an equation	Holt: 6-4, 6-5, 6-6 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8 Flipbook: Pg. 9	Percent of change, Percent increase, Percent decrease, Commission, Commission rate, Interest, Simple interest, Principle, Interest rate, Percent, Tax, Markup, Markdown, Gratuity, Fees, Percent error

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: 10-2, Lab Pg. 422, 10-4, 10-5, 10-6, 10-7, 10-8, 10-9, 10-3, Lab Pg. 424, and Lab Pg. 430.			
Fluency Standards to Revisit and Embed			
➡️**7.EE.B.4** – Use variables to represent quantities in mathematical problems and problems in real-world context, and construct simple equations and inequalities to solve problems.			
7.NS.A.3 – Solve mathematical problems and problems in real-world context involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions where $a/b \div c/d$ when a, b, c, and d are all integers and b, c, and $d \neq 0$.			
Probability			
By the end of this unit of study, students will investigate chance processes and develop, use, and evaluate probability models.			
7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	★Identify a valid sample (random, representative, and proportional to population) ★Justify a chosen sampling method	Holt: 7-3, Real-World Pg. 295 Mathematical Practices: 3, 6 Flipbook: Pg. 49	Population sample, Random sample, Convenience sample, Biased sample, Representative sample, Inferences, Sample size, Sample, Generalization, Unbiased, Valid
7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on*	★Draw inferences about a population based on a set of random samples ★Explore the variation among a set of random samples	Holt: Lab Pg. 290 Mathematical Practices: 1, 2, 3, 4, 5, 6, 7 Flipbook: Pg. 50 *Supplement with* *<u>Connected Mathematics</u> Number and Operations Investigation 5*	Sample, Variation

randomly sampled survey data. Gauge how far off the estimate or prediction might be.			
7.SP.C.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Greater numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	o Recognize that probability can be measured using a fraction, decimal, or percent between the numbers 0 and 1 ★ Identify the likelihood of a chance event occurring ★ Given a likelihood of an event occurring, identify a possible probability ★ Compare probabilities as being more or less likely	Holt: 10-1 Mathematical Practices: 4, 5, 6, 7 Flipbook: Pg. 57 *Supplement with* *Connected Mathematics Data Analysis and Probability Investigation 5*	Experiment, Trial, Outcome Event, Probability, Simple event, Compound event, Complement
7.SP.C.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*	★ Approximate/estimate the probability of a chance event by observing collected data (empirical/experimental probability) ★ Predict the approximate relative frequency given the theoretical probability	Holt: 10-2, Lab pg. 422 Mathematical Practices: 1, 2, 3, 4, 5 Flipbook: Pg. 59 *Supplement with* *Connected Mathematics Data Analysis and Probability Investigations 2, 3, 4*	Experimental probability, Prediction, Theoretical probability, Law of large numbers

7.SP.C.7
Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies. If the agreement is not good, explain possible sources of the discrepancy.
  a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.
 	
  b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?
	★ Given a probability model, find the probability of a combination of events contained in the model (7.SP.7a, 7.SP.7b)
	★ Given a situation that is clearly uniform (7.SP.7a), or given data (7.SP7b), create a probability model
	★ Given a situation that is clearly uniform (7.SP.7a), or given data (7.SP.7b), create a probability model and find the probability of a combination of events contained in the model
		Holt: 10-3, Lab Pg. 424, Lab Pg. 430
		Mathematical Practices: 1, 2, 3, 4, 5, 6, 7, 8
		Flipbook: Pg. 61
		
		Supplement with
		McDougal-Littell Algebra 11.9, Connected Mathematics Data Analysis and Probability Investigation 7
			Theoretical probability, Experimental probability

Quarter Taught				Essential Standards (➡Grade Level Guaranteed Standards)
1	2	3	4	Number Sense (NS):
X				➡**7.NS.A.1** – Add and subtract integers and other rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. b. Understand $p + q$ as the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world context. c. Understand subtraction of rational numbers as adding the additive inverse, $p – q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world context. d. Apply properties of operations as strategies to add and subtract rational numbers.
X				➡**7.NS.A.2** – Multiply and divide integers and other rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the Distributive Property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world context. b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world context. c. Apply properties of operations as strategies to multiply and divide rational numbers. d. Convert a rational number to decimal form using long division; know that the decimal form of a rational number terminates in 0's or eventually repeats.
				Expressions and Equations (EE):
X				**7.EE.A.1** – Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
X				**7.EE.A.2** – Rewrite an expression in different forms, and understand the relationship between the different forms and their meanings in a problem context.
	X			**7.EE.B.3** – Solve multi-step mathematical problems and problems in real-world context posed with positive and negative rational numbers in any form. Convert between forms as appropriate and assess the reasonableness of answers.
X				➡**7.EE.B.4** – Use variables to represent quantities in mathematical problems and problems in real-world context, and construct simple equations and inequalities to solve problems. a. Solve word problems leading to equations of the form $px+q = r$ and $p(x+q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. b. Solve word problems leading to inequalities of the form $px+q > r$ or $px+q < r$, where p, q, and r are rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.
				Ratios and Proportions (RP):
	X			**7.RP.A.1** – Compute unit rates associated with ratios involving both simple and complex fractions, including ratios of quantities measured in like or different units.
	X			**7.RP.A.2** – Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship (e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin). b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$. d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.
		X		➡**7.RP.A.3** – Use proportional relationships to solve multi-step ratio and percent problems (e.g., simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, and percent error).

				Geometry (G):
		X		**7.G.B.4** – Understand and use the formulas for the area and circumference of a circle to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
				Statistics and Probability (SP):
		X		**7.SP.B.4** – Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

Quarter Taught				**Supporting Standards**
1	2	3	4	Number Sense (NS):
X	X	X		7.NS.A.3 – Solve mathematical problems and problems in real-world context involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions where $a/b \div c/d$ when a, b, c, and d are all integers and b, c, and $d \neq 0$.
				Geometry (G):
	X			7.G.A.1 – Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
		X		7.G.A.2 – Draw geometric shapes with given conditions using a variety of methods. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
		X		7.G.A.3 – Describe the two-dimensional figures that result from slicing three-dimensional figures.
	X			7.G.B.5 – Use facts about supplementary, complementary, vertical, and adjacent angles in multi-step problems to write and solve simple equations for an unknown angle in a figure.
	X			7.G.B.6 – Solve mathematical problems and problems in a real-world context involving area of two-dimensional objects composed of triangles, quadrilaterals, and other polygons. Solve mathematical problems and problems in real-world context involving volume and surface area of three-dimensional objects composed of cubes and right prisms.
				Statistics and Probability (SP):
			X	7.SP.A.1 – Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
			X	7.SP.A.2 – Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.
		X		7.SP.B.3 – Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
			X	7.SP.C.5 – Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
			X	7.SP.C.6 – Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
			X	7.SP.C.7 – Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies. If the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.