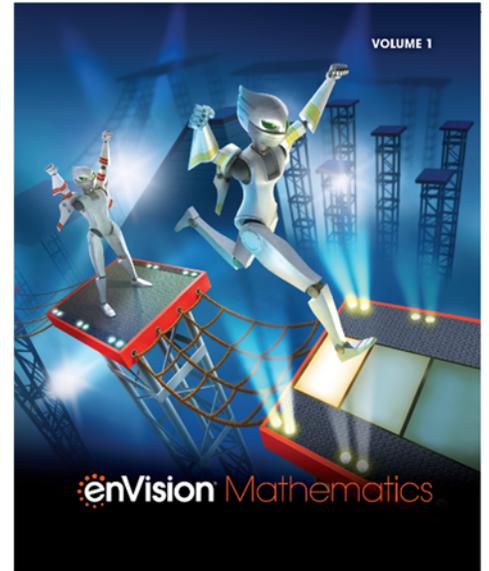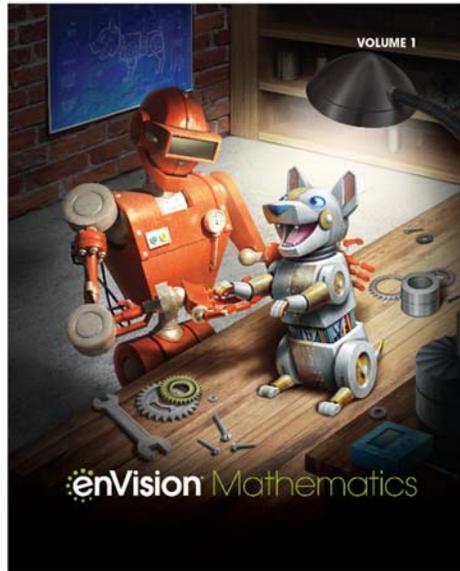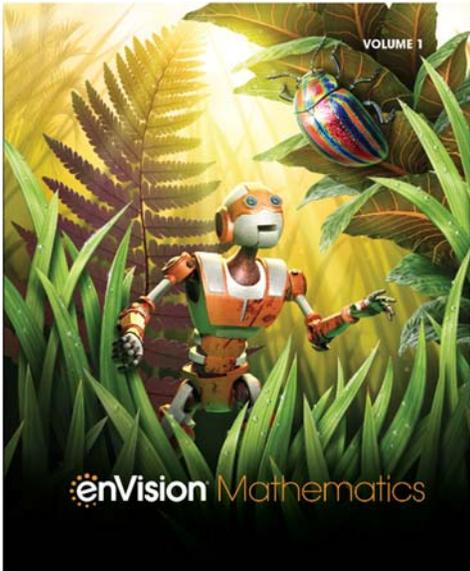**A Correlation of**

enVision® Mathematics

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to the

Georgia Standards of Excellence Mathematics Grades 6-8

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Introduction

The new enVision® Mathematics ©2021 is the latest offering of the nationally recognized Grades K-12 series, created for print, digital, and blended instruction. Problem-Based Learning connects with Visual Learning to deep conceptual understanding. Interactive multimedia experiences engage learners in student choice and solving rich problems. Extensive customization and differentiation options empower every teacher and student.

UNDERSTANDING
A simple lesson design provides a clear, intentional pathway. Starting on a firm foundation of conceptual understanding, students can connect and apply math ideas in amazing ways. High-interest math projects invite all students to be active participants.

A simple lesson design provides a clear, intentional pathway.

STEP 1 Problem-Based Learning
STEP 2 Visual Learning
STEP 3 Assess and Differentiate

ASSESSMENT
The enVision Assessment Suite offers options to move students toward mastery of state standards while driving instructional differentiation.

DIAGNOSTIC Assessment
Reading Test, Diagnostic Test (Math Diagnosis and Intervention System), Review What You Know
FORMATIVE Assessment
SCOUT Observational Assessment used during Solve & Share, Do You Understand? And Convince Me! Guide Practice, Quick Check
SUMMATIVE Assessment
Topic Assessments, Topic Performance Assessments, Examview Test Generator, Fluency Assessments, Cumulative/Benchmarks Assessments, Progress Monitoring Assessments

INSTRUCTIONAL SUPPORT
Gain a new perspective on your teaching with embedded strategies, methods, and a wide range of Professional Development opportunities in print and digital formats.

Ideas, Inspiration, and Teaching Methods
Math background for every Topic and Lesson serves as an easy-to-access math methods course.

Make every lesson perfect for you. Access all digital content, assessments, and management tools at SavvasRealize.com.

Kids See the Math. Teachers See Results.

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Georgia Standards of Excellence Mathematics Grade 6	enVision Mathematics, ©2021 Grade 6
Standards for Mathematical Practice	
Students are expected to:	
1 Make sense of problems and persevere in solving them. In grade 6, students solve problems involving ratios and rates and discuss how they solved them. Students solve real world problems through the application of algebraic and geometric concepts. Students seek the meaning of a problem and look for efficient ways to represent and solve it. They may check their thinking by asking themselves, "What is the most efficient way to solve the problem?", "Does this make sense?", and "Can I solve the problem in a different way?"	enVision Mathematics provides numerous instructional opportunities to help students develop proficiency in the math practices. To get students off to a good start on all eight practices, use the Math Practices and Problem Solving Handbook pages online. Each lesson begins with Problem-Based Learning, an activity in which students interact with their peers and teachers to make sense of and decide on a workable solution for a situation. Another feature of each lesson is the set of problem-solving exercises in which students persevere by applying different skills and strategies to solve problems. Each Problem-Solving Lesson provides instruction and practice focused on a specific math practice. **SE/TE:** 38, 43, 50, 54, 55, 56, 79, 80, 140, 149, 165, 214, 215, 272, 320, 371, 378, 384, 418, 431, 442, 446, 454, 473
2 Reason abstractly and quantitatively. In grade 6, students represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Students contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.	enVision Mathematics provides scaffolded instruction to help students develop both quantitative and abstract reasoning. In the Visual Learning Bridge, students can see how to represent a given situation numerically or algebraically. They will have opportunities later in the lesson to reason abstractly as they endeavor to represent situations symbolically. Reasonableness exercises remind students to compare their work to the original situation. Reasoning problems throughout the exercise sets focus students' attention on the structure or meaning of an operation, for example, rather than merely the solution. **SE/TE:** 20, 26, 37, 38, 43, 44, 73, 78, 106, 109, 133, 154, 172, 190, 196, 222, 272, 283, 302, 304, 318, 331, 350, 351, 363, 372, 410, 441, 500

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3 Construct viable arguments and critique the reasoning of others. In grade 6, students construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). They further refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. They pose questions like "How did you get that?", "Why is that true?" "Does that always work?" They explain their thinking to others and respond to others' thinking.	Consistent with a focus on reasoning and sense-making is a focus on critical reasoning—argumentation and critique of arguments. In enVision Mathematics, the Problem-Based Learning affords students opportunities to share with classmates their thinking about problems, their solution methods, and their reasoning about the solutions. Many exercises found throughout the program explicitly call for students to justify or explain their solutions. The ability to articulate a clear explanation for a process is a stepping stone to critical analysis and reasoning of both the student's own process and those of others. **SE/TE:** 54, 55, 72, 80, 85, 92, 108, 111, 126, 128, 140, 142, 156, 165, 166, 188, 238, 239, 250, 272, 302, 308, 318, 324, 332, 364, 441, 448, 502
4 Model with mathematics. In grade 6, students model problem situations symbolically, graphically, tabularly, and contextually. Students form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Students begin to explore covariance and represent two quantities simultaneously. Students use number lines to compare numbers and represent inequalities. They use measures of center and variability and data displays (i.e. box plots and histograms) to draw inferences about and make comparisons between data sets. Students need many opportunities to connect and explain the connections between the different representations. They should be able to use all of these representations as appropriate to a problem context.	Students using enVision Mathematics explicitly use mathematical modeling in each Topic during the 3-Act Math lesson. The Visual Learning Bridge also often presents real-world situations, demonstrating how these problems can be modeled mathematically. **SE/TE:** 44, 135, 142, 149, 155, 156, 164, 195, 201, 203, 204, 223, 230, 252, 288, 289, 290, 298, 304, 326, 378, 422, 448, 473, 486, 487, 488, 493, 505, 508, 514

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5 Use appropriate tools strategically. Students consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful. For instance, students in grade 6 may decide to represent similar data sets using dot plots with the same scale to visually compare the center and variability of the data. Additionally, students might use physical objects or applets to construct nets and calculate the surface area of three-dimensional figures.	Students become fluent in the use of a wide assortment of tools ranging from physical objects, including manipulatives, integer chips, algebra tiles, and even pencil and paper, to digital tools, such as graphing calculators, Online Math Tools, and computers. As students become more familiar with the tools available to them, they are able to begin making decisions about which tools are most helpful in a particular situation. **SE/TE:** 104, 109, 110, 229, 230, 250, 251, 278, 288, 289, 290, 376, 416, 432, 446, 448, 486, 487, 488, 492, 493, 494, 513, 514
6 Attend to precision. In grade 6, students continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students use appropriate terminology when referring to rates, ratios, geometric figures, data displays, and components of expressions, equations or inequalities.	Students are expected to use mathematical terms and symbols with precision. Key terms are highlighted in each lesson and important concepts presented in the Concept Summary. The Problem-Based Learning activity provides repeated opportunities for students to use precise language to explain their solution paths while solving problems. In the Convince Me! feature, students revisit these key terms or concepts and provide explicit definitions or explanations. **SE/TE:** 25, 37, 43, 49, 50, 56, 109, 141, 202, 213, 215, 296, 297, 298, 303, 309, 319, 325, 331, 363, 371, 378, 382, 405, 406, 411, 412, 417, 423, 430, 447, 448, 452, 453, 454, 508, 513

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7 Look for and make use of structure. Students routinely seek patterns or structures to model and solve problems. For instance, students recognize patterns that exist in ratio tables recognizing both the additive and multiplicative properties. Students apply properties to generate equivalent expressions (i.e. $6 + 2x = 3 (2 + x)$ by distributive property) and solve equations (i.e. $2c + 3 = 15$, $2c = 12$ by subtraction property of equality), c=6 by division property of equality). Students compose and decompose two- and three-dimensional figures to solve real world problems involving area and volume.	Students are encouraged to look for structure as they develop solution plans. For example, as students mature in their mathematical thinking, they see structure when working with problems that can be represented with the Distributive Property. This focus on looking for and recognizing structure enables students to draw from patterns as they formalize their thinking about the structure of operations. **SE/TE:** 44, 50, 86, 103, 104, 110, 156, 164, 166, 171, 172, 244, 245, 246, 330, 351, 364, 370, 384, 424, 430, 453, 479
8 Look for and express regularity in repeated reasoning. In grade 6, students use repeated reasoning to understand algorithms and make generalizations about patterns. During multiple opportunities to solve and model problems, they may notice that $a/b \div c/d = ad/bc$ and construct other examples and models that confirm their generalization. Students connect place value and their prior work with operations to understand algorithms to fluently divide multi-digit numbers and perform all operations with multi-digit decimals. Students informally begin to make connections between covariance, rates, and representations showing the relationships between quantities.	Students are reminded to think about problems they have encountered previously that may share features or processes. They are encouraged to draw on the solution plan developed for such problems, and, as their mathematical thinking matures, to look for and apply generalizations to similar situations. **SE:** 19, 50, 127, 128, 166, 270, 271, 276, 277, 282, 283, 284, 310, 432
Ratios and Proportional Relationships 6.RP	
Understand ratio concepts and use ratio reasoning to solve problems.	
MGSE6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*	**SE:** 267 – 272, 273 – 278, 279 – 284, 333 - 338 **TE:** 267A - 272B, 273A - 278B, 279A - 284B, 333 - 338

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MGSE6.RP.2 Understand the concept of a unit rate *a / b* associated with a ratio *a: b* with *b ≠ 0* (b not equal to zero), and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*	**SE:** 293 – 298, 299 – 304, 305 – 310, 333 - 338 **TE:** 293A - 298B, 299A - 304B, 305A - 310B, 333 - 338
MGSE6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems utilizing strategies such as tables of equivalent ratios, tape diagrams (bar models), double number line diagrams, and/or equations.	**SE:** 267 – 272, 273 – 278, 279 – 284, 285 – 290, 293 – 298, 299 – 304, 305 – 310, 315 – 320, 321 – 326, 327 – 332, 333 - 338 **TE:** 267A - 272B, 273A - 278B, 279A - 284B, 285A - 290B, 293A - 298B, 299A - 304B, 305A - 310B, 315A-320B, 321A-326B, 327A-332B, 333 - 338
MGSE6.RP.3a Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	**SE:** 273 – 278, 279 – 284, 285 – 290, 333 - 338 **TE:** 273A - 278B, 279A - 284B, 285A - 290B, 333 - 338
MGSE6.RP.3b Solve unit rate problems including those involving unit pricing and constant speed. *For example, If it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*	**SE:** 293 – 298, 299 – 304, 305 – 310, 333 - 338 **TE:** 293A - 298B, 299A - 304B, 305A - 310B, 333 - 338
MGSE6.RP.3c Find a percent of a quantity as a rate per 100 (e.g. 30% of a quantity means 30/100 times the quantity); given a percent, solve problems involving finding the whole given a part and the part given the whole.	**SE:** 347 – 352, 373 – 378, 379 – 384, 389 - 392 **TE:** 347A - 352B, 373A - 378B, 379A - 384B, 389 - 392
MGSE6.RP.3d Given a conversion factor, use ratio reasoning to convert measurement units within one system of measurement and between two systems of measurements (customary and metric); manipulate and transform units appropriately when multiplying or dividing quantities. *For example, given 1 in. = 2.54 cm, how many centimeters are in 6 inches?*	**SE:** 315 – 320, 321 – 326, 327 – 332, 333 - 338 **TE:** 315A-320B, 321A-326B, 327A-332B, 333 - 338

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The Number System 6.NS	
Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	
MGSE6.NS.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, including reasoning strategies such as using visual fraction models and equations to represent the problem. *For example:* • How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? • *How many 3/4-cup servings are in 2/3 of a cup of yogurt?* • *How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?* • Three pizzas are cut so each person at the table receives ¼ pizza. How many people are at the table? • *Create a story context for* (2/3)÷(3/4) *and use a visual fraction model to show the quotient;* • *Use the relationship between multiplication and division to explain that* (2/3)÷(3/4)=8/9 *because* 3/4 *of* 8/9 *is* 2/3. *(In general,* (*a*/*b*)÷(*c*/*d*)=*ad*/*bc*.)	**SE:** 33 – 38, 39 – 44, 45 – 50, 51 – 56, 57 - 60 **TE:** 33A - 38B, 39A - 44B, 45A - 50B, 51A - 56B, 57 - 60
Compute fluently with multi-digit numbers and find common factors and multiples.	
MGSE6.NS.2 Fluently divide multi-digit numbers using the standard algorithm.	**SE:** 15-20, 57-60 **TE:** 15A-20B, 57-60
MGSE6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	**SE:** 9 -14, 15-20, 57-60 **TE:** 9A-14B, 15A-20B, 57-60
MGSE6.NS.4 Find the common multiples of two whole numbers less than or equal to 12 and the common factors of two whole numbers less than or equal to 100.	**SE:** 129-136, 173-176 **TE:** 129A-136B, 173-176
a. Find the greatest common factor of 2 whole numbers and use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factors. (GCF) *Example: 36 + 8 = 4(9 + 2)*	**SE:** 129-136, 173-176 **TE:** 129A-136B, 173-176

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b. Apply the least common multiple of two whole numbers less than or equal to 12 to solve real-world problems.	**SE:** 129-136, 173-176 **TE:** 129A-136B, 173-176
Apply and extend previous understandings of numbers to the system of rational numbers.	
MGSE6.NS.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, debits/credits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	**SE:** 69-74, 111-114 **TE:** 69A-74B, 111-114
MGSE6.NS.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	**SE:** 69-74, 75-80, 89-94, 111-114, 419-424, 455-460 **TE:** 69A-74B, 75A-80B, 89A-94B, 111-114, 419A-424B, 455-460
MGSE6.NS.6a Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.	**SE:** 69-74, 111-114 **TE:** 69A-74B, 111-114
MGSE6.NS.6b Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.	**SE:** 89-94, 111-114 **TE:** 89A-94B, 111-114
MGSE6.NS.6c Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	**SE:** 69-74, 75-80, 89-94, 111-114, 419-424, 455-460 **TE:** 69A-74B, 75A-80B, 89A-94B, 111-114, 419A-424B, 455-460

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MGSE6.NS.7 Understand ordering and absolute value of rational numbers.	**SE:** 75-80, 81-86, 111-114 **TE:** 75A-80B, 81A-86B, 111-114
MGSE6.NS.7a Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret −3>−7 as a statement that −3 is located to the right of −7 on a number line oriented from left to right.*	**SE:** 75-80, 111-114 **TE:** 75A-80B, 111-114
MGSE6.NS.7b Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write −3°C > −7°C to express the fact that −3°C is warmer than −7°C.*	**SE:** 75-80, 111-114 **TE:** 75A-80B, 111-114
MGSE6.NS.7c Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of −30 dollars, write |−30| = 30 to describe the size of the debt in dollars.*	**SE:** 81-86, 111-114 **TE:** 81A-86B, 111-114
MGSE6.NS.7d Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than −30 dollars represents a debt greater than 30 dollars.*	**SE:** 81-86, 111-114 **TE:** 81A-86B, 111-114
MGSE6.NS.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	**SE:** 99-104, 105-110, 111-114, 419-424, 455-460 **TE:** 99A-104B, 105A-110B, 111-114, 419A-424B, 455-460

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Expressions and Equations 6.EE	
Apply and extend previous understandings of arithmetic to algebraic expressions.	
MGSE6.EE.1 Write and evaluate numerical expressions involving whole-number exponents**.**	**SE:** 123-128, 137-142, 173-176 **TE:** 123A-128B, 137A-142B, 173-176
MGSE6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers.	**SE:** 145-150, 173-176, 401-406, 407-412, 413-418, 419-424, 437-442, 443-448, 449-454, 455-460 **TE:** 145A-150B, 173-176, 401A-406B, 407A-412B, 413A-413B, 419A-424B, 437A-442B, 443A-448B, 449A-454B, 455-460
MGSE6.EE.2a Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as* 5–*y.*	**SE:** 145-150, 173-176, 437-442, 443-448, 449-454, 455-460 **TE:** 145A-150B, 173-176, 437A-442B, 443A-448B, 449A-454B, 455-460
MGSE6.EE.2b Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression* 2(8+7) *as a product of two factors; view* (8+7) *as both a single entity and a sum of two terms.*	**SE:** 145-150, 173-176 **TE:** 145A-150B, 173-176
MGSE6.EE.2c Evaluate expressions at specific values for their variables. Include expressions that arise from formulas in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas V=s3 and A=6s2 to find the volume and surface area of a cube with sides of length s=1/2.*	**SE:** 151-156, 173-176, 401-406, 407-412, 413-418, 419-424, 437-442, 443-448, 449-454, 455-460 **TE:** 151A-156B, 173-176, 401A-406B, 407A-412B, 413A-413B, 419A-424B, 437A-442B, 443A-448B, 449A-454B, 455-460

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MGSE6.EE.3 Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression* $3(2+x)$ *to produce the equivalent expression* $6+3x$*; apply the distributive property to the expression* $24x+18y$ *to produce the equivalent expression* $6(4x+3y)$*; apply properties of operations to* $y+y+y$ *to produce the equivalent expression* $3y$.	**SE:** 137-142, 161-166, 167-172, 173-176 **TE:** 137A-142B, 161A-166B, 167A-172B, 173-176
MGSE6.EE.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions* $y+y+y$ *and* $3y$ *are equivalent because they name the same number regardless of which number* y *stands for.*	**SE:** 137-142, 161-166, 173-176, 191-196, 253-258 **TE:** 137A-142B, 161A-166B, 173-176, 191A-196B, 253-258
Reason about and solve one-variable equations and inequalities.	
MGSE6.EE.5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	**SE:** 185-190, 219-224, 225-230, 253-258 **TE:** 185A-190B, 219A-224B, 225A-230B, 253-258
MGSE6.EE.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	**SE:** 145-150, 151-156, 173-176, 197-202, 203-208, 209-216, 253-258, 437-442, 443-448, 449-454, 455-460 **TE:** 145A-150B, 151A-156B, 173-176, 197A-202B, 203A-208B, 209A-216B, 253-258, 437A-442B, 443A-448B, 449A-454B, 455-460
MGSE6.EE.7 Solve real-world and mathematical problems by writing and solving equations of the form $x+p=q$ and $px=q$ for cases in which p, q and x are all nonnegative rational numbers.	**SE:** 191-196, 197-202, 203-208, 209-216, 253-258 **TE:** 191A-196B, 197A-202B, 203A-208B, 209A-216B, 253-258

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MGSE6.EE.8 Write an inequality of the form $x>c$ or $x<c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x>c$ or $x<c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	**SE:** 219-224, 225-230, 253-258 **TE:** 219A-224B, 225A-230B, 253-258
Represent and analyze quantitative relationships between dependent and independent variables.	
MGSE6.EE.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another.	**SE:** 235-240, 241-246, 247-252, 253-258 **TE:** 235A-240B, 241A-246B, 247A-252B, 253-258
a. Write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable.	**SE:** 241-246, 253-258 **TE:** 241A-246B, 253-258
b. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.*	**SE:** 247-252, 253-258 **TE:** 247A-252B, 253-258
Geometry 6.G	
Solve real-world and mathematical problems involving area, surface area, and volume.	
MGSE6.G.1 Find area of right triangles, other triangles, quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems**.**	**SE:** 401-406, 407-412, 413-418, 419-424, 455-460 **TE:** 401A-406B, 407A-412B, 413A-413B, 419A-424B, 455-460

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MGSE6.G.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths (1/2 u), and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = (length) x (width) x (height) and V= (area of base) x (height) to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	**SE:** 449-454, 455-460 **TE:** 449A-454B, 455-460
MGSE6.G.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	**SE:** 105-110, 111-114, 419-424, 455-460 **TE:** 105A-110B, 111-114, 419A-424B, 455-460
MGSE6.G.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	**SE:** 427-432, 437-442, 443-448, 455-460 **TE:** 427A-432B, 437A-442B, 443A-448B, 455-460
Statistics and Probability 6.SP	
Develop understanding of statistical variability.	
MGSE6.SP.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*	**SE:** 469-474, 519-522 **TE:** 469A-474B, 519-522
MGSE6.SP.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	**SE:** 509-514, 519-522 **TE:** 509A-514B, 519-522

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MGSE6.SP.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.	**SE:** 475-482, 519-522 **TE:** 475A-482B, 519-522
Summarize and describe distributions.	
MGSE6.SP.4 Display numerical data in plots on a number line, including dot plots (line plots), histograms, and box plots.	**SE:** 469-474, 483-488, 489-494, 497-502, 509-514, 519-522 **TE:** 469A-474B, 483A-488B, 489A-494B, 497A-502B, 509A-514B, 519-522
MGSE6.SP.5 Summarize numerical data sets in relation to their context, such as by:	**SE:** 475-482, 489-494, 497-502, 503-508, 509-514, 519-522 **TE:** 475A-482B, 489A-494B, 497A-502B, 503A-508B, 509A-514B, 519-522
a. Reporting the number of observations.	**SE:** 489-494, 519-522 **TE:** 489A-494B, 519-522
b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	**SE:** 509-514, 519-522 **TE:** 509A-514B, 519-522
c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range).	**SE:** 475-482, 497-502, 503-508, 509-514, 519-522 **TE:** 475A-482B, 497A-502B, 503A-508B, 509A-514B, 519-522
d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data was gathered.	**SE:** 503-508, 519-522 **TE:** 503A-508B, 519-522

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Georgia Standards of Excellence Mathematics Grade 7	enVision Mathematics, ©2021 Grade 7
Standards for Mathematical Practice	
Students are expected to:	
1 Make sense of problems and persevere in solving them. In grade 7, students solve problems involving ratios and rates and discuss how they solved them. Students solve real world problems through the application of algebraic and geometric concepts. Students seek the meaning of a problem and look for efficient ways to represent and solve it. They may check their thinking by asking themselves, "What is the most efficient way to solve the problem?", "Does this make sense?", and "Can I solve the problem in a different way?"	enVision Mathematics provides numerous instructional opportunities to help students develop proficiency in the math practices. To get students off to a good start on all eight practices, use the Math Practices and Problem Solving Handbook pages online. Each lesson begins with Problem-Based Learning, an activity in which students interact with their peers and teachers to make sense of and decide on a workable solution for a situation. Another feature of each lesson is the set of problem-solving exercises in which students persevere by applying different skills and strategies to solve problems. Each Problem-Solving Lesson provides instruction and practice focused on a specific math practice. **SE/TE:** 14, 32, 46, 69, 93, 130, 148, 153, 159, 160, 168, 178, 212, 218, 220, 225, 243, 274, 278, 279, 328, 330. 344, 373, 377, 378, 379, 388, 461
2 Reason abstractly and quantitatively. In grade 7, students represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Students contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.	enVision Mathematics provides scaffolded instruction to help students develop both quantitative and abstract reasoning. In the Visual Learning Bridge, students can see how to represent a given situation numerically or algebraically. They will have opportunities later in the lesson to reason abstractly as they endeavor to represent situations symbolically. Reasonableness exercises remind students to compare their work to the original situation. Reasoning problems throughout the exercise sets focus students' attention on the structure or meaning of an operation, for example, rather than merely the solution. **SE/TE:** 12, 13, 30, 31, 37, 56, 68, 105, 106, 128, 129, 152, 166, 184, 212, 329, 335, 378, 384, 454, 456

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3 Construct viable arguments and critique the reasoning of others. In grade 7, students construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). They further refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. They pose questions like "How did you get that?", "Why is that true?" "Does that always work?". They explain their thinking to others and respond to others' thinking.	Consistent with a focus on reasoning and sense-making is a focus on critical reasoning—argumentation and critique of arguments. In enVision Mathematics, the Problem-Based Learning affords students opportunities to share with classmates their thinking about problems, their solution methods, and their reasoning about the solutions. Many exercises found throughout the program explicitly call for students to justify or explain their solutions. The ability to articulate a clear explanation for a process is a stepping stone to critical analysis and reasoning of both the student's own process and those of others. **SE/TE:** 26, 31, 36, 45, 64, 68, 98, 105, 112, 146, 148, 152, 154, 158, 166, 183, 214, 244, 292, 309, 327, 335, 336, 337, 350, 372, 378, 384, 440, 460, 480
4 Model with mathematics. In grade 7, students model problem situations symbolically, graphically, tabularly, and contextually. Students form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Students explore covariance and represent two quantities simultaneously. They use measures of center and variability and data displays (i.e. box plots and histograms) to draw inferences, make comparisons and formulate predictions. Students use experiments or simulations to generate data sets and create probability models. Students need many opportunities to connect and explain the connections between the different representations. They should be able to use all of these representations as appropriate to a problem context.	Students using enVision Mathematics explicitly use mathematical modeling in each Topic during the 3-Act Math lesson. The Visual Learning Bridge also often presents real-world situations, demonstrating how these problems can be modeled mathematically. **SE/TE:** 12, 25, 26, 30, 38, 50, 63, 70, 93, 111, 122, 160, 201, 225, 272, 273, 274, 286, 287, 288, 292, 293, 294, 308, 374, 402, 410, 440, 441, 442, 447, 480

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5 Use appropriate tools strategically. Students consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful. For instance, students in grade 7 may decide to represent similar data sets using dot plots with the same scale to visually compare the center and variability of the data. Students might use physical objects or applets to generate probability data and use graphing calculators or spreadsheets to manage and represent data in different forms	Students become fluent in the use of a wide assortment of tools ranging from physical objects, including manipulatives, integer chips, algebra tiles, and even pencil and paper, to digital tools, such as graphing calculators, Online Math Tools, and computers. As students become more familiar with the tools available to them, they are able to begin making decisions about which tools are most helpful in a particular situation. **SE:** 12, 13, 25, 122, 128, 286, 287, 288, 292, 293, 294, 308, 402, 410, 440, 441, 442, 447, 480
6 Attend to precision. In grade 7, students continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students define variables, specify units of measure, and label axes accurately. Students use appropriate terminology when referring to rates, ratios, probability models, geometric figures, data displays, and components of expressions, equations or inequalities.	Students are expected to use mathematical terms and symbols with precision. Key terms are highlighted in each lesson and important concepts presented in the Concept Summary. The Problem-Based Learning activity provides repeated opportunities for students to use precise language to explain their solution paths while solving problems. In the Convince Me! feature, students revisit these key terms or concepts and provide explicit definitions or explanations. **SE:** 18, 20, 45, 51, 106, 146, 147, 168, 182, 201, 236, 308, 327, 391, 392, 435, 455, 456, 461, 468, 469, 470, 478, 479, 480, 484, 485, 486, 490, 491, 492

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7 Look for and make use of structure. Students routinely seek patterns or structures to model and solve problems. For instance, students recognize patterns that exist in ratio tables making connections between the constant of proportionality in a table with the slope of a graph. Students apply properties to generate equivalent expressions (i.e. $6 + 2x = 3 (2 + x)$ by distributive property) and solve equations (i.e. $2c + 3 = 15$, $2c = 12$ by subtraction property of equality), c=6 by division property of equality). Students compose and decompose two- and three-dimensional figures to solve real world problems involving scale drawings, surface area, and volume. Students examine tree diagrams or systematic lists to determine the sample space for compound events and verify that they have listed all possibilities.	Students are encouraged to look for structure as they develop solution plans. For example, as students mature in their mathematical thinking, they see structure when working with problems that can be represented with the Distributive Property. This focus on looking for and recognizing structure enables students to draw from patterns as they formalize their thinking about the structure of operations. **SE:** 19, 38, 44, 57, 58, 62, 90, 123, 177, 200, 218, 242, 248, 250, 266, 272, 274, 454
8 Look for and express regularity in repeated reasoning. In grade 7, students use repeated reasoning to understand algorithms and make generalizations about patterns. During multiple opportunities to solve and model problems, they may notice that $a/b \div c/d = ad/bc$ and construct other examples and models that confirm their generalization. They extend their thinking to include complex fractions and rational numbers. Students formally begin to make connections between covariance, rates, and representations showing the relationships between quantities. They create, explain, evaluate, and modify probability models to describe simple and compound events.	Students are reminded to think about problems they have encountered previously that may share features or processes. They are encouraged to draw on the solution plan developed for such problems, and, as their mathematical thinking matures, to look for and apply generalizations to similar situations. **SE:** 99, 182, 200, 206, 207, 218, 219, 220, 225, 403, 404, 470, 475

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Ratios and Proportional Relationships 7.RP	
Analyze proportional relationships and use them to solve real-world and mathematical problems.	
MGSE7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction (1/2)/(1/4) miles per hour, equivalently 2 miles per hour.	**SE:** 89-94, 95-100, 131-134 **TE:** 89A-94B, 95A-100B, 131-134
MGSE7.RP.2 Recognize and represent proportional relationships between quantities.	**SE:** 101-106, 107-112, 119-124, 131-134, 143-148, 149-154, 155-160, 185-188, 331-338, 357-360, 375-380, 417-422 **TE:** 101A-106B, 107A-112B, 119A-124B, 131-134, 143A-143B, 149A-149B, 155A-160B, 185-188, 331A-338B, 375A-380B, 417-422
MGSE7.RP.2a 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.	**SE:** 101-106, 119-124, 131-134, 143-148, 185-188 **TE:** 101A-106B, 119A-124B, 131-134, 143A-143B, 185-188
MGSE7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	**SE:** 107-112, 119-124, 131-134, 143-148, 185-188 **TE:** 107A-112B, 119A-124B, 143-148, 143A-143B, 185-188
MGSE7.RP.2c 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 $t = p$m.	**SE:** 107-112, 131-134, 149-154, 155-160, 185-188, 331-338, 357-360, 375-380, 417-422 **TE:** 107A-112B, 131-134, 149A-149B, 155A-160B, 185-188, 331A-338B, 375A-380B, 417-422
MGSE7.RP.2d Explain what a point (x,) 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.	**SE:** 119-124, 131-134 **TE:** 119A-124B, 131-134

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MGSE7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, and fees.	**SE:** 89-94 95-100, 125-130, 131-134, 143-148, 149-154, 155-160, 163-168, 173-178, 179-184, 185-188 **TE:** 89A-94B, 95A-100B, 125A-130B, 131-134, 143A-143B, 149A-149B, 155A-160B, 163A-168B, 173A-178B, 179A-184B, 185-188
The Number System 7.NS	
Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	
MGSE7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.	**SE:** 9-14, 21-26, 27-32, 33-38, 75-80 **TE:** 9A-14B, 21A-26B, 27A-32B, 33A-38B, 75-80
MGSE7.NS.1a Show that a number and its opposite have a sum of 0 (are additive inverses). Describe situations in which opposite quantities combine to make 0. *For example, your bank account balance is -$25.00. You deposit $25.00 into your account. The net balance is $0.00.*	**SE:** 9-14, 75-80 **TE:** 9A-14B, 75-80
MGSE7.NS.1b 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. Interpret sums of rational numbers by describing real world contexts.	**SE:** 21-26, 33-38, 75-80 **TE:** 21A-26B, 33A-38B, 75-80
MGSE7.NS.1c 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 contexts.	**SE:** 27-32, 33-38, 75-80 **TE:** 27A-32B, 33A-38B, 75-80
MGSE7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.	**SE:** 21-26, 27-32, 33-38, 75-80 **TE:** 21A-26B, 27A-32B, 33A-38B, 75-80

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MGSE7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	**SE:** 15-20, 41-46, 47-52, 53-58, 59-64, 75-80 **TE:** 15A-20B, 41A-46B, 47A-52B, 53A-58B, 59A-64B, 75-80
MGSE7.NS.2a 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 contexts.	**SE:** 41-46, 47-52, 75-80 **TE:** 41A-46B, 47A-52B, 75-80
MGSE7.NS.2b 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 contexts.	**SE:** 53-58, 59-64, 75-80 **TE:** 53A-58B, 59A-64B, 75-80
MGSE7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.	**SE:** 41-46, 47-52, 53-58, 59-64, 75-80 **TE:** 41A-46B, 47A-52B, 53A-58B, 59A-64B, 75-80
MGSE7.NS.2d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	**SE:** 15-20, 75-80 **TE:** 15A-20B, 75-80
MGSE7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.	**SE:** 65-70, 75-80, 481-486, 487-492, 493-498 **TE:** 65A-70B, 75-80, 481A-486B, 487A-492B, 493-498

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A Correlation of enVision Mathematics, ©2021
to the Georgia Standards of Excellence Mathematics

Georgia Standards of Excellence Mathematics Grade 7	enVision Mathematics, ©2021 Grade 7
Expressions and Equations 7.EE	
Use properties of operations to generate equivalent expressions.	
MGSE7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	**SE:** 203-208, 209-214, 215-220, 221-226, 233-238, 239-244, 251-254 **TE:** 203A-208B, 209A-214B, 215A-220B, 221A-226B, 233A-238B, 239A-244B, 251-254
MGSE7.EE.2 Understand that rewriting an expression in different forms in a problem context can clarify the problem and how the quantities in it are related. *For example a + 0.05a = 1.05a means that adding a 5% tax to a total is the same as multiplying the total by 1.05.*	**SE:** 215-220, 221-226, 233-238, 239-244, 245-250, 251-254 **TE:** 215A-220B, 221A-226B, 233A-238B, 239A-244B, 245A-250B, 251-254
Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	
MGSE7.EE.3 Solve multistep real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals) by applying properties of operations as strategies to calculate with numbers, converting between forms as appropriate, and assessing the reasonableness of answers using mental computation and estimation strategies. *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.* *• If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*	**SE:** 65-70, 75-80, 197-202, 251-254, 269-274, 275-280, 311-314, 331-338, 357-360, 369-374, 387-392, 417-422, 465-470, 481-486, 487-492, 493-498 **TE:** 65A-70B, 75-80, 197A-202B, 251-254, 269A-274B, 275A-280B, 311-314, 331A-338B, 357-360, 369A-374B, 387A-392B, 417-422, 465A-470B, 481A-486B, 487A-492B, 493-498
MGSE7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.	**SE:** 197-202, 251-254, 263-268, 269-274, 275-280, 283-288, 289-294, 299-304, 305-310, 311-314, 457-462, 465-470, 481-486, 487-492, 493-498 **TE:** 197A-202B, 251-254, 263A-263B, 269A-274B, 275A-280B, 283A-288B, 289A-294B, 299A-304B, 305A-310B, 311-314, 457A-462B, 465A-470B, 481A-486B, 487A-492B, 493-498

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MGSE7.EE.4a Solve word problems leading to equations of the form $px+q=r$ and $(x+q)=r$, 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. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*	**SE:** 197-202, 251-254, 263-268, 269-274, 275-280, 311-314, 457-462, 465-470, 481-486, 487-492, 493-498 **TE:** 197A-202B, 251-254, 263A-263B, 269A-274B, 275A-280B, 311-314, 457A-462B, 465A-470B, 481A-486B, 487A-492B, 493-498
MGSE7.EE.4b Solve word problems leading to inequalities of the form $px+q>r$ or $pp+q<r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example, as a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*	**SE:** 283-288, 289-294, 299-304, 305-310, 311-314 **TE:** 283A-288B, 289A-294B, 299A-304B, 305A-310B, 311-314
MGSE7.EE.4c Solve real-world and mathematical problems by writing and solving equations of the form x+p = q and px = q in which p and q are rational numbers.	**SE:** 269 – 274, 283 – 288, 289 – 294, 311 - 314 **TE:** 269A - 274B, 283A - 288B, 289A - 294B, 311 - 314
Geometry 7.G	
Draw, construct, and describe geometrical figures and describe the relationships between them.	
MGSE7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	**SE:** 431-436, 493-498 **TE:** 431A-436B, 493-498
MGSE7.G.2 Explore various geometric shapes with given conditions. Focus on creating triangles from three measures of angles and/or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	**SE:** 437-442, 443-450, 493-498 **TE:** 437A-424B, 443A-450B, 493-498

Georgia Standards of Excellence Mathematics Grade 7	enVision Mathematics, ©2021 Grade 7
MGSE7.G.3 Describe the two-dimensional figures (cross sections) that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms, right rectangular pyramids, cones, cylinders, and spheres.	**SE:** 475-480, 493-498 **TE:** 475A-480B, 493-498
Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	
MGSE7.G.4 Given the formulas for the area and circumference of a circle, use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	**SE:** 457-462, 465-470, 493-498 **TE:** 457A-462B, 465A-470B, 493-498
MGSE7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	**SE:** 451-456, 493-498 **TE:** 451A-456B, 493-498
MGSE7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	**SE:** 481-486, 487-492, 493-498 **TE:** 481A-486B, 487A-492B, 493-498
Statistics and Probability 7.SP	
Use random sampling to draw inferences about a population.	
MGSE7.SP.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.	**SE:** 323-330, 331-338, 357-360 **TE:** 323A-330B, 331A-338B, 357-360
MGSE7.SP.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 randomly sampled survey data. Gauge how far off the estimate or prediction might be.*	**SE:** 331-338, 357-360 **TE:** 331A-338B, 357-360

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Draw informal comparative inferences about two populations.	
MGSE7.SP.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the medians by expressing it as a multiple of the interquartile range.	**SE:** 341-346, 347-352, 357-360 **TE:** 341A-346B, 347A-352B, 357-360
MGSE7.SP.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.*	**SE:** 341-346, 347-352, 357-360 **TE:** 341A-346B, 347A-352B, 357-360
Investigate chance processes and develop, use, and evaluate probability models.	
MGSE7.SP.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.	**SE:** 369-374, 417-422 **TE:** 369A-374B, 417-422
MGSE7.SP.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. 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.*	**SE:** 375-380, 381-386, 417-422 **TE:** 375A-380B, 381A-386B, 417-422
MGSE7.SP.7 Develop a probability model and use it to find probabilities of events. Compare experimental and theoretical probabilities of events. If the probabilities are not close, explain possible sources of the discrepancy.	**SE:** 381-386, 387-392, 417-422 **TE:** 381A-386B, 387A-392B, 417-422

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MGSE7.SP.7a 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.*	**SE:** 381-386, 387-392, 417-422 **TE:** 381A-386B, 387A-392B, 417-422
MGSE7.SP.7b 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?*	**SE:** 387-392, 417-422 **TE:** 387A-392B, 417-422
MGSE7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	**SE:** 399-404, 405-410, 411-416, 417-422 **TE:** 399A-404B, 405A-410B, 411A-416B, 417-422
MGSE7.SP.8a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	**SE:** 405-410, 417-422 **TE:** 405A-410B, 417-422
MGSE7.SP.8b Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.	**SE:** 399-404, 417-422 **TE:** 399A-404B, 417-422
MGSE7.SP.8c Explain ways to set up a simulation and use the simulation to generate frequencies for compound events. *For example, if 40% of donors have type A blood, create a simulation to predict the probability that it will take at least 4 donors to find one with type A blood.*	**SE:** 411-416, 417-422 **TE:** 411A-416B, 417-422

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Standards for Mathematical Practice	
Students are expected to:	
1 Make sense of problems and persevere in solving them. In grade 8, students solve real world problems through the application of algebraic and geometric concepts. Students seek the meaning of a problem and look for efficient ways to represent and solve it. They may check their thinking by asking themselves, "What is the most efficient way to solve the problem?", "Does this make sense?", and "Can I solve the problem in a different way?"	enVision Mathematics provides numerous instructional opportunities to help students develop proficiency in the math practices. To get students off to a good start on all eight practices, use the Math Practices and Problem Solving Handbook pages online. Each lesson begins with Problem-Based Learning, an activity in which students interact with their peers and teachers to make sense of and decide on a workable solution for a situation. Another feature of each lesson is the set of problem-solving exercises in which students persevere by applying different skills and strategies to solve problems. Each Problem-Solving Lesson provides instruction and practice focused on a specific math practice. **SE/TE:** 92, 93, 126, 150, 192, 204, 235, 243, 320, 330, 413, 438, 443, 444, 457
2 Reason abstractly and quantitatively. In grade 8, students represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. They examine patterns in data and assess the degree of linearity of functions. Students contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.	enVision Mathematics provides scaffolded instruction to help students develop both quantitative and abstract reasoning. In the Visual Learning Bridge, students can see how to represent a given situation numerically or algebraically. They will have opportunities later in the lesson to reason abstractly as they endeavor to represent situations symbolically. Reasonableness exercises remind students to compare their work to the original situation. Reasoning problems throughout the exercise sets focus students' attention on the structure or meaning of an operation, for example, rather than merely the solution. **SE/TE:** 14, 18, 20, 24, 50, 74, 98, 104, 112, 113, 130, 137, 180, 194, 224, 248, 276, 286, 319, 324, 326, 340, 348, 355, 374, 419, 438, 442

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3 Construct viable arguments and critique the reasoning of others. In grade 8, students construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). They further refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. They pose questions like "How did you get that?", "Why is that true?" "Does that always work?" They explain their thinking to others and respond to others' thinking.	Consistent with a focus on reasoning and sense-making is a focus on critical reasoning—argumentation and critique of arguments. In enVision Mathematics, the Problem-Based Learning affords students opportunities to share with classmates their thinking about problems, their solution methods, and their reasoning about the solutions. Many exercises found throughout the program explicitly call for students to justify or explain their solutions. The ability to articulate a clear explanation for a process is a stepping stone to critical analysis and reasoning of both the student's own process and those of others. **SE/TE:** 18, 19, 24, 30, 32, 36, 38, 46, 51, 56, 58, 62, 73, 111, 113, 132, 150, 169, 174, 193, 200, 228, 248, 271, 276, 284, 286, 290, 340, 349, 374, 375, 398, 437
4 Model with mathematics. In grade 8, students model problem situations symbolically, graphically, tabularly, and contextually. Students form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Students solve systems of linear equations and compare properties of functions provided in different forms. Students use scatterplots to represent data and describe associations between variables. Students need many opportunities to connect and explain the connections between the different representations. They should be able to use all of these representations as appropriate to a problem context.	Students using enVision Mathematics explicitly use mathematical modeling in each Topic during the 3-Act Math lesson. The Visual Learning Bridge also often presents real-world situations, demonstrating how these problems can be modeled mathematically. **SE/TE:** 26, 46, 94, 98, 99, 125, 137, 138, 143, 148, 149, 168, 174, 175, 176, 193, 204, 205, 206, 222, 223, 242, 276, 277, 278, 292, 312, 313, 318, 319, 320, 331, 341, 342, 349, 354, 355, 356, 406, 418

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5 Use appropriate tools strategically. Students consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful. For instance, students in grade 8 may translate a set of data given in tabular form to a graphical representation to compare it to another data set. Students might draw pictures, use applets, or write equations to show the relationships between the angles created by a transversal.	Students become fluent in the use of a wide assortment of tools ranging from physical objects, including manipulatives, integer chips, algebra tiles, and even pencil and paper, to digital tools, such as graphing calculators, Online Math Tools, and computers. As students become more familiar with the tools available to them, they are able to begin making decisions about which tools are most helpful in a particular situation. **SE/TE:** 94, 144, 148, 149, 174, 175, 176, 204, 205, 206, 223, 276, 277, 278, 312, 313, 318, 319, 320, 341, 342, 354, 355, 356
6 Attend to precision. In grade 8, students continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students use appropriate terminology when referring to the number system, functions, geometric figures, and data displays.	Students are expected to use mathematical terms and symbols with precision. Key terms are highlighted in each lesson and important concepts presented in the Concept Summary. The Problem-Based Learning activity provides repeated opportunities for students to use precise language to explain their solution paths while solving problems. In the Convince Me! feature, students revisit these key terms or concepts and provide explicit definitions or explanations. **SE/TE:** 12, 25, 31, 36, 56, 57, 286, 354, 361, 362, 363, 364, 368, 369, 370, 375, 376, 399, 400, 404, 405, 406, 419, 436, 437, 438, 442, 443, 444, 450, 451, 452, 456, 457, 458
7 Look for and make use of structure. Students routinely seek patterns or structures to model and solve problems. In grade 8, students apply properties to generate equivalent expressions and solve equations. Students examine patterns in tables and graphs to generate equations and describe relationships. Additionally, students experimentally verify the effects of transformations and describe them in terms of congruence and similarity.	Students are encouraged to look for structure as they develop solution plans. For example, as students mature in their mathematical thinking, they see structure when working with problems that can be represented with the Distributive Property. This focus on looking for and recognizing structure enables students to draw from patterns as they formalize their thinking about the structure of operations. **SE/TE:** 12, 52, 72, 93, 99, 104, 105, 111, 136, 148, 169, 170, 198, 242, 270, 285, 361, 398, 404, 412, 450

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8 Look for and express regularity in repeated reasoning. In grade 8, students use repeated reasoning to understand algorithms and make generalizations about patterns. Students use iterative processes to determine more precise rational approximations for irrational numbers. During multiple opportunities to solve and model problems, they notice that the slope of a line and rate of change are the same value. Students flexibly make connections between covariance, rates, and representations showing the relationships between quantities.	Students are reminded to think about problems they have encountered previously that may share features or processes. They are encouraged to draw on the solution plan developed for such problems, and, as their mathematical thinking matures, to look for and apply generalizations to similar situations. **SE/TE:** 31, 45, 51, 63, 131, 250, 291, 330, 399, 405, 413, 457

The Number System 8.NS	
Know that there are numbers that are not rational, and approximate them by rational numbers.	
MGSE8.NS.1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	**SE:** 9-14, 15-20, 75-80 **TE:** 9A-14B, 15A-20B, 75-80
MGSE8.NS.2 Use rational approximation of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line, and estimate the value of expressions (e.g., estimate π2 *to the nearest tenth). For example, by truncating the decimal expansion of √2 (square root of 2), show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*	**SE:** 21-26, 75-80 **TE:** 21A-26B, 75-80

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Expressions and Equations 8.EE	
Work with radicals and integer exponents.	
MGSE8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{(-5)} = 3^{(-3)} = 1/(3^3) = 1/27$.	**SE:** 41-46, 47-52, 75-80 **TE:** 41A-46B, 47A-52B, 75-80
MGSE8.EE.2 Use square root and cube root symbols to represent solutions to equations. Recognize that $x^2 = p$ (where p is a positive rational number and lxl < 25) has 2 solutions and $x^3 = p$ (where p is a negative or positive rational number and lxl < 10) has one solution. Evaluate square roots of perfect squares < 625 and cube roots of perfect cubes > -1000 and < 1000.	**SE:** 27-32, 33-38, 75-80 **TE:** 27A-32B, 33A-38B, 75-80
MGSE8.EE.3 Use numbers expressed in scientific notation to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.*	**SE:** 53-58, 75-80 **TE:** 53A-58B, 75-80
MGSE8.EE.4 Add, subtract, multiply and divide numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Understand scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g. use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology (e.g. calculators).	**SE:** 59-64, 69-74, 75-80 **TE:** 59A-64B, 69A-74B, 75-80

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Understand the connections between proportional relationships, lines, and linear equations.	
MGSE8.EE.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.*	**SE:** 121-126, 151-156 **TE:** 121A-126B, 151-156
MGSE8.EE.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 b.	**SE:** 127-132, 133-138, 139-144, 145-150, 151-156 **TE:** 127A-132B, 133A-138B, 139A-144B, 145A-150B, 151-156
Analyze and solve linear equations and pairs of simultaneous linear equations.	
MGSE8.EE.7 Solve linear equations in one variable.	**SE:** 89-94, 95-100, 101-106, 107-114, 151-156 **TE:** 89A-94B, 95A-100B, 101A-106B, 107A-114B, 151-156
MGSE8.EE.7a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x=a$, $a=a$, or $a=b$ results (where a and b are different numbers).	**SE:** 107-114, 151-156 **TE:** 107A-114B, 151-156
MGSE8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	**SE:** 89-94, 95-100, 101-106, 151-156 **TE:** 89A-94B, 95A-100B, 101A-106B, 151-156
MGSE8.EE.8 Analyze and solve pairs of simultaneous linear equations (systems of linear equations).	**SE:** 267-272, 273-278, 281-286, 287-292, 297-300 **TE:** 267A-272B, 273A-273B, 281A-286B, 287A-292B, 297-300

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MGSE8.EE.8a 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.	**SE:** 273-278, 297-300 **TE:** 273A-273B, 297-300
MGSE8.EE.8b Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, $3x+2y=5$ and $3x+2y=6$ have no solution because $3x+2y$ cannot simultaneously be 5 and 6.*	**SE:** 267-272, 281-286, 287-292, 297-300 **TE:** 267A-272B, 281A-286B, 287A-292B, 297-300
MGSE8.EE.8c Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*	**SE:** 267-272, 273-278, 281-286, 287-292, 297-300 **TE:** 267A-272B, 273A-273B, 281A-286B, 287A-292B, 297-300
Functions 8.F	
Define, evaluate, and compare functions.	
MGSE8.F.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.	**SE:** 165-170, 171-176, 207-210 **TE:** 165A-170B, 171A-176B, 207-210
MGSE8.F.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.*	**SE:** 177-182, 189-194, 207-210 **TE:** 177A-182B, 189A-194B, 207-210

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MGSE8.F.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=s2 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.*	**SE:** 177-182, 207-210, 225-230, 231-236, 255-258 **TE:** 177A-182B, 207-210, 225A-230B, 231A-236B, 255-258
Use functions to model relationships between quantities.	
MGSE8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	**SE:** 189-194, 207-210, 225-230, 231-236, 255-258 **TE:** 189A-194B, 207-210, 225A-230B, 231A-236B, 255-258
MGSE8.F.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.	**SE:** 195-200, 201-206, 207-210 **TE:** 195A-200B, 201A-206B, 207-210
Geometry 8.G	
Understand congruence and similarity using physical models, transparencies, or geometry software.	
MGSE8.G.1 Verify experimentally the congruence properties of rotations, reflections, and translations: lines are taken to lines and line segments to line segments of the same length; angles are taken to angles of the same measure; parallel lines are taken to parallel lines.	**SE:** 309-314, 315-320, 321-326, 327-332, 377-382 **TE:** 309A-314B, 315A-320B, 321A-326B, 327A-332B, 377-382
MGSE8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	**SE:** 337-342, 377-382 **TE:** 337A-342B, 377-382

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MGSE8.G.3 Describe the effect of dilations, translations, rotations and reflections on two-dimensional figures using coordinates.	**SE:** 309-314, 315-320, 321-326, 327-332, 337-342, 345-350, 351-356, 377-382 **TE:** 309A-314B, 315A-320B, 321A-326B, 327A-332B, 337A-342B, 345A-350B, 351A-356B, 377-382
MGSE8.G.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	**SE:** 345-350, 351-356, 377-382 **TE:** 345A-350B, 351A-356B, 377-382
MGSE8.G.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 three angles appear to form a line, and give an argument in terms of transversals why this is so.*	**SE:** 357-364, 365-370, 371-376, 377-382 **TE:** 357A-364B, 365A-370B, 371A-376B, 377-382
Understand and apply the Pythagorean Theorem.	
MGSE8.G.6 Explain a proof of the Pythagorean Theorem and its converse.	**SE:** 395-400, 401-406, 421-424 **TE:** 395A-400B, 401A-406B, 421-424
MGSE8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	**SE:** 395-400, 401-406, 409-414, 421-424 **TE:** 395A-400B, 401A-406B, 409A-414B, 421-424
MGSE8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	**SE:** 415-420, 421-424 **TE:** 415A-420B, 421-424
Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	
MGSE8.G.9 Apply the formulas for the volume of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	**SE:** 433-438, 439-444, 447-452, 453-458, 463-466 **TE:** 433A-438B, 439A-444B, 447A-452B, 453A-458B, 463-466

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Statistics and Probability 8.SP	
Investigate patterns of association in bivariate data.	
MGSE8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	**SE:** 219-224, 255-258 **TE:** 219A-224B, 255-258
MGSE8.SP.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.	**SE:** 225-230, 255-258 **TE:** 225A-230B, 255-258
MGSE8.SP.3 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.*	**SE:** 231-236, 255-258 **TE:** 231A-236B, 255-258
MGSE8.SP.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.	**SE:** 239-244, 245-250, 255-258 **TE:** 239A-244B, 245A-250B, 255-258
a. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects.	**SE:** 239-244, 245-250, 255-258 **TE:** 239A-244B, 245A-250B, 255-258
b. 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?*	**SE:** 239-244, 245-250, 255-258 **TE:** 239A-244B, 245A-250B, 255-258