7th Grade
Math Power Standards

Algebraic Relationships		GLE's Remaining/CCSS standards (Bold-face highlighted does not align with GLEs) (Illustrations examples in blue)	CCSS	Vertical Movement to 7th
2. Represent and analyze mathematical situations and structures using algebraic symbols	A. Represent mathematical situations	Use symbolic algebra to represent unknown quantities in expressions or equations and solve linear equations with one variable (below, keep) **A1D7** ***identify functions as linear or nonlinear from tables, graphs*** or equations **A2A7** ***use symbolic algebra to represent unknown quantities in*** expressions or ***equations*** and solve linear equations with one variable **A2B7** ***use properties to generate equivalent forms for simple algebraic expressions that include positive rational and integers*** **N1C7** ****recognize equivalent representations for the same number and generate them*** by decomposing and composing numbers including exponential notation Ratio and Proportional Relationships 7.RP Analyze proportional relationships and use them to solve real-world and mathematical problems. 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 = pn* **Expressions and Equations 7.EE** **Use properties of operations to generate equivalent expressions.** **http://illustrativemathematics.org/illustrations/543** **http://illustrativemathematics.org/illustrations/433** 1) Apply properties of operations as strategies to add, subtract, **factor,** and **expand linear expressions with rational coefficients** **http://illustrativemathematics.org/illustrations/541** 2) **Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.** ***For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by***	**7.RP.2.c** **7.EE.1** **7.EE.2**	**A2A8 Use symbolic algebra to represent and solve problems that involve linear relationships.**

7th Grade
Math Power Standards

		1.05." **http://illustrativemathematics.org/illustrations/643** **Expressions and Equations 7.EE** **Solve real-life and mathematical problems using numerical and algebraic expressions and equations** 3) Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess 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 $\frac{1}{10}$ of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 $\frac{3}{4}$ inches long in the center of a door that is 27 $\frac{1}{2}$ 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.* 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 4a) 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. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* 4b) Solve word problems leading to inequalities of the form *px + q > r* or *px + 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* **Geometry 7.G** **Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.**	**7.EE.3** **7.EE.4** **7.EE.4.a** **7.EE.4.b**	

7th Grade
Math Power Standards

		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.	**7.G.5**	
3. Use mathematical models to represent and understand quantitative relationships.	A. Use mathematical models	Model and solve problems, using multiple representations such as graphs, tables, expressions, and linear equations(below, keep) **A3A7** ***model and solve problems using multiple representations such as graphs, tables*****,** expressions**,** ***and linear equations*** **Ratio and Proportional Relationships 7.RP** **Analyze proportional relationships and use them to solve real-world and mathematical problems.** 2b) Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	**7.RP.2.b**	
Data and Probability		**GLE's Remaining/CCSS standards** **(Bold-face highlighted does not align with GLEs)**	**CCSS**	**Vertical Movement to 7th**
1. Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them.	C. Represent and interpret data	Select, create and use appropriate graphical representation of data, including circle graphs, histograms (dropped) **D2A7** ***find, use, and interpret measures of center and spread, including ranges*** **D3A7** ***use observations about differences between samples to make conjectures about the populations from which the samples were taken*** **D4A7** use models to ***compute the probability of an event and make conjectures*** (based on theoretical probability) ***about the results of experiments*** Statistics and Probability 7.SP Use random sampling to draw inferences about a population**.** **http://illustrativemathematics.org/illustrations/235** **http://illustrativemathematics.org/illustrations/559** **http://illustrativemathematics.org/illustrations/558** **http://illustrativemathematics.org/illustrations/260** 1) Understand that statistics can be used to gain information about a population by examining a sample of the population;	**7.SP.1**	D1A6 Formulate questions, design studies and **collect data about a characteristic.** D1A8 ***select, create and use appropriate graphical representation of data (including scatter plots)*** **and box plots (box and whiskers)**

		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. 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.* **Statistics and Probability 7.SP** **Draw informal comparative inferences about two populations.** **http://illustrativemathematics.org/illustrations/261** 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.* *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.* **Statistics and Probability 7.SP** **Investigate chance processes and develop, use, and evaluate probability models.** 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	**7.SP.2** **7.SP.3** **7.SP.4** **7.SP.5**	**D4A5 Describe the degree of likelihood of events using each words as certain, equally likely and impossible.**

		probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. 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.* 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. 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.* 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?* 8) Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **http://illustrativemathematics.org/illustrations/343** **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.** 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. 8c) **Design and use a simulation to generate frequencies for**	**7.SP.6** **7.SP.7** **7.SP.7.a** **7.SP.7.b** **7.SP.8** **7.SP.8.a** **7.SP.8.b** **7.SP.8.c**	**D4A6 Use a model (diagram, list, sample space, or area model) to illustrate the possible outcomes of an event.**

7th Grade
Math Power Standards

		compound events. ***For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?***		
Geometric and Spatial Relationships		**GLE's Remaining/CCSS standards (Bold-face highlighted does not align with GLEs)**	**CCSS**	**Vertical Movement to 7th**
None		None **Geometry 7.G** **Draw, construct, and describe geometrical figures and describe the relationships between them.** 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. **http://illustrativemathematics.org/illustrations/107** 2) Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. **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.** 3) Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids	**7.G.1** **7.G.2** **7.G.3**	**G3B8 Describe the relationship between the scale factor and the area of the image using a dilation (stretching or shrinking)**
Measurement		**GLE's Remaining/CCSS standards (Bold-face highlighted does not align with GLEs)**	**CCSS**	**Vertical Movement to 7th**
2. Apply appropriate techniques, tools and formulas to	C. Apply geometric measurements	Solve problems involving circumference and/or area of a circle and surface area/volume of a rectangular or triangular prism, or cylinder (below and keep) **M1B7** ***identify the equivalent area and volume measures within a system of measurement (e.g. sq. ft. to sq. in., m^2 to cm^2)*** **M2C7** ***solve problems involving*** circumference and/or area of a circle and ***surface area/volume of a rectangular or triangular prism***, or cylinder		**M2B8 Solve problems of angle measure including those involving triangles and parallel lines cut by a transversal.**

7th Grade
Math Power Standards

		Geometry 7.G Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. 4) Know the formulas for the area and circumference of a circle and use them to solve problems; **give an informal derivation of the relationship between the circumference and area of a circle.** **http://illustrativemathematics.org/illustrations/34** 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. **http://illustrativemathematics.org/illustrations/266**	**7.G.4** **7.G.6**	**M2C6** ***Solve problems involving the area*** or perimeter ***of polygons***
Number Operations		**GLE's Remaining/CCSS standards** **(Bold-face highlighted does not align with GLEs)**	**CCSS**	**Vertical Movement to 7th**
1 Understand ways of representing number, relationships among numbers and number systems	B. Represent and use rational numbers	Recognize and generate equivalent forms of fractions, decimals, and per cents. (below and keep) **N1A7** compare and ***order*** all positive ***rational numbers and find their approximate locations on a number line*** **N1B7** ***recognize and generate equivalent forms of fractions, decimals*** and per cents **N2B7** ****describe the effects of*** all ***operations on rational numbers including integers*** **The Number System 7.NS** **Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.** 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. **1a) Describe situations in which opposite quantities combine to make 0.** ***For example, a hydrogen atom has 0 charge***	**7.NS.1** **7.NS.1.a**	**N1B8** ***use fractions***, decimals and per cents ***to solve problems***

7th Grade
Math Power Standards

		because its two constituents are oppositely charged. 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. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. 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.	**7.NS.1.b** **7.NS.2.d**	
3 Compute fluently and make reasonable estimates	C. Compute problems	Apply all operations on rational numbers including integers (below and keep) **N2B7*describe the effects of** all ***operations on rational numbers including integers*** **N2C7 *apply properties of operations (including order of operations) to positive rational numbers and integers** **N3C7 *apply*** all ***operations on rational numbers including integers*** **N3D7 *estimate and justify the results of all operations on rational numbers*** **The Number System 7.NS** **Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.** 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. 1d) Apply properties of operations as strategies to add and subtract rational numbers. 2) Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 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	**7.NS.1.c** **7.NS.1.d** **7.NS.2** **7.NS.2.a**	

		and the rules for multiplying signed numbers. **Interpret products of rational numbers by describing real-world contexts.** 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 $-\left(\frac{p}{q}\right) = \frac{(-p)}{q} = \frac{p}{(-q)}$. **Interpret quotients of rational numbers by describing real-world contexts.** 2c) Apply properties of operations as strategies to multiply and divide rational numbers. 3) **Solve real-world** and mathematical **problems involving the four operations with rational numbers.** **(Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)** **http://illustrativemathematics.org/illustrations/298** **Expressions and Equations 7.EE** **Solve real-life and mathematical problems using numerical and algebraic expressions and equations.** 3) Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess 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 $\frac{1}{10}$ of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ 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.* **http://illustrativemathematics.org/illustrations/478** **http://illustrativemathematics.org/illustrations/108**	**7.NS.2.b** **7.NS.2.c** **7.NS.3** **7.EE.3**	

7th Grade
Math Power Standards

	E. Use proportional reasoning	**N3E7 *solve problems involving proportions***, such as scaling ***and finding equivalent ratios*** **Ratio and Proportional Relationships 7.RP** **Analyze proportional relationships and use them to solve real-world and mathematical problems.** **http://illustrativemathematics.org/illustrations/99** **http://illustrativemathematics.org/illustrations/114** **http://illustrativemathematics.org/illustrations/98** 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* $\frac{1}{2}$ *mile in each* $\frac{1}{4}$ *hour, compute the unit rate as the complex fraction* $\frac{\frac{1}{2}}{\frac{1}{4}}$ *miles per hour, equivalently 2 miles per hour.* **http://illustrativemathematics.org/illustrations/470** **http://illustrativemathematics.org/illustrations/82** 2) Recognize and represent proportional relationships between quantities **http://illustrativemathematics.org/illustrations/100** **http://illustrativemathematics.org/illustrations/101** **http://illustrativemathematics.org/illustrations/104** **http://illustrativemathematics.org/illustrations/95** **http://illustrativemathematics.org/illustrations/181** **http://illustrativemathematics.org/illustrations/180** 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. 2b) Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. 3) Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error* **http://illustrativemathematics.org/illustrations/148**	**7.RP.1** **7.RP.2** **7.RP.2.a** **7.RP.2.b** **7.RP.3**	**N3E6 *solve problems using ratios and rates***

7th Grade
Math Power Standards

		http://illustrativemathematics.org/illustrations/130 http://illustrativemathematics.org/illustrations/121 http://illustrativemathematics.org/illustrations/117 http://illustrativemathematics.org/illustrations/102 http://illustrativemathematics.org/illustrations/105 http://illustrativemathematics.org/illustrations/106 http://illustrativemathematics.org/illustrations/266		

Grade 7 GLEs not included in Grade 7 CAS

N2D7 *approximate the value of square roots to the nearest whole number
A1B7 analyze patterns represented graphically or numerically with words of symbolic rules, including recursive notation
A1C7 compare and contrast various forms of representations of patterns
A4A7 compare situations with constant or varying rates of change
G1B7 describe relationships between corresponding sides, corresponding angles, and corresponding perimeters of similar polygons
G2A7 use coordinate geometry to construct and identify geometric shapes in the coordinate plane using their properties
G3C7 *determine all lines of symmetry of a polygon
G4A7 *use spatial visualization to identify various 2-dimensional views of isometric drawings
M1A7 *identify and justify the unit of measure for volume (customary and metric)
M1C7 solve problems involving addition and subtraction of time (hours, minutes, and seconds)
M2B7 *use tools to measure angles to the nearest degree and classify the angle as acute, obtuse, right, straight, or reflex
M2E7 convert from one unit to another within a system of measurement (capacity) and convert square or cubic units within the same system of measurement
D1C7 select, create, and use appropriate graphical representation of data, including circle graphs, histograms