2019-2020 8th Grade Algebra Skills:
Students Will Know/ Students Will Be Able To…

Report Card Skill: SOLVE Equations	
For this skill, students will know: ● and recognize the explicit connection of using inverse operations to solve equations. ● and apply the definition of x- and y-intercept.	**For this skill, students will be able to:** ● solve multi-variable equations and inequalities or literal equations for a specific variable. ● calculate/determine the x- and y-intercepts given functions in various formats (slope-intercept, standard, etc.).

Report Card Skill: GRAPH Linear Equations	
For this skill, students will know: ● and recognize restricted domains with respect to linear functions. ● the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. ● the meaning of the input and output given a function or ordered pair in context. ● and apply the definition of x- and y-intercept. ● the components of an equation written in point-slope form ● parallel lines have the same slope and perpendicular lines have slopes that are opposite reciprocals.	**For this skill, students will be able to:** ● graph a linear function with a restricted domain. ● determine if an ordered pair is a solution to a linear function. ● graph a function from a given domain and relate the domain of a function to its graph. ● graph linear functions by finding the x- and y-intercepts ● graph an equation written in point-slope form. ● determine if lines are parallel or perpendicular.

Report Card Skill: WRITE Linear Equations	
For this skill, students will know: ● relationships between variables can be modeled using an equation, table, or graph. ● slope is a rate of change between any two points. ● the components of an equation written in slope-intercept form. ● the components of an equation written in point-slope form ● parallel lines have the same slope and perpendicular lines have slopes that are opposite reciprocals.	**For this skill, students will be able to:** ● write an equation to represent a relationship between two variables for a given situation. ● calculate and interpret the average rate of change for a function. ● write an equation in slope-intercept form given: slope and intercept, graph, and two points. ● write an equation in point-slope form given: point and slope, graph, and two points ● write equations of parallel and perpendicular lines.

Report Card Skill: INEQUALITIES: Solve, Graph, and Write	
For this skill, students will know: ● relationships between variables can be modeled using an inequality, table, or graph. ● how to use inverse operations, combining like terms, distributive property, and inequality rules to solve inequalities (including proportions). ● the graph of a linear inequality is a region on the coordinate plane with a boundary line.	**For this skill, students will be able to:** ● write an inequality to represent a relationship between two variables for a given contextual situation ● solve and graph inequalities in one variable. ● graph and identify solutions of linear inequalities on the coordinate plane based on shading.

Report Card Skill: Solve SYSTEMS	
For this skill, students will know: ● the solution to a system of equations is the point of intersection or a point that satisfies both equations. ● a system of equations resulting in parallel lines will have no solution. ● a system of equations resulting in a single line will have infinitely many solutions. ● the graph of a system of linear inequalities is an overlapping region on the coordinate plane formed by two or more boundary lines.	**For this skill, students will be able to:** ● solve a system of linear equations by graphing, using substitution, and/or elimination. ● recognize solutions to special systems that have infinitely many or no solutions (graphically and algebraically). ● graph and identify solutions of a system of linear inequalities on the coordinate plane based on shading.

Report Card Skill: Apply EXPONENT Rules	
For this skill, students will know: ● bases must be the same before exponents can be added, subtracted, or multiplied. ● exponents are added with a product of powers. ● exponents are multiplied with a power of a power. ● exponents are subtracted with the quotient of powers. ● a number raised to the zero (0) power is equal to one. ● and understand the relationship between negative exponents and reciprocals. ● scientific notation is used to represent very large or small numbers.	**For this skill, students will be able to:** ● to generate equivalent numerical expressions. ● perform operations with numbers expressed in scientific notation.

Report Card Skill: Perform Operations with POLYNOMIALS	
For this skill, students will know: ● the zero product property. ● recognize the relationship between polynomials in standard and factored form. ● in order to add/subtract polynomials a common base (like term) is required. ● how to apply the distributive property to polynomial multiplication.	**For this skill, students will be able to:** ● solve polynomials in factored form. ● factor and solve polynomials. ● perform operations with polynomials. ● Factor polynomials.

Report Card Skill: Solve and Graph QUADRATICS	
For this skill, students will know: ● how an input-output table relates to the graph of a (quadratic) function. ● how to locate and define key features of the graph of a quadratic equation and how it relates to the equation/graph of the function. ● the relationship between the number of solutions to a quadratic equation and its x-intercepts (zeros)/discriminant. ● the square root method can be used to solve quadratic equations with no degree one term. ● the quadratic formula and how it can be used to solve any quadratic equation.	**For this skill, students will be able to:** ● complete a table of values for a quadratic equation. ● identify key features (y-intercept, vertex, axis of symmetry, minimum/maximum) of the graph of a quadratic equation and use them to create a graph of the function. ● determine the number of solutions using the graph of a quadratic equation and discriminant. ● use square roots to solve quadratic equations. ● use the quadratic formula to solve any quadratic equation.

Report Card Skill: Perform Operations with RADICALS	
For this skill, students will know: ● prime factorization can be used to simplify radical expressions. ● like radical terms can be added or subtracted. ● a simplified expression cannot contain a radical in the denominator. ● radicals can be multiplied and further simplified.	**For this skill, students will be able to:** ● simplify radical expressions.
● inverse operations are used to solve radical equations.	● solve radical equations.
● and be able to identify extraneous solutions.	● determine if all solutions to radical equations are valid.
● the relationships that exist between sides of a right triangle (Pythagorean Theorem).	● use the Pythagorean Theorem to find missing sides of a right triangle or determine if given side lengths form a right triangle.
● how the distance and midpoint formulas are derived using the coordinate plane	● use the distance and midpoint formulas.

Report Card Skill: REASON/PROBLEM SOLVE	
For this skill, students will know: ● the definition of a function as it applies to graphs, tables, and equations.	**For this skill, students will be able to:** ● recognize graphs, tables, equations as functions.
● and apply the definition of x- and y-intercept.	● determine/interpret the meaning of intercepts in context
● parallel lines have the same slope.	● justify if two lines are parallel.
● how to make sense of problems and persevere in solving them.	● solve real-world problems through the application of algebraic and geometric concepts. ● seek the meaning of a problem and look for different ways to represent and solve it.

● how to construct viable arguments and critique the reasoning of others.	● construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models and graphs, tables, and other data displays. ● refine their mathematical communication skills through discussions that evaluate their own thinking and the thinking of their peer. ● use clear and precise language/terminology in their discussions.
● different representations can be used to model mathematics.	● model problem situations symbolically, graphically, tabularly, and contextually. ● explain the connections between different representations. ● consider the available tools when solving a mathematical problem and decide when certain tools may be helpful.