

## **Glenwood Community Schools 6-12 Math Curriculum Mission Statement**

Our mission is to engage all students in a challenging, sequential, and differentiated math curriculum that will develop critical thinkers, problem solvers, and effective communicators.

We believe that all students should have access to a high-quality math education that provides them with the skills and knowledge they need to be well-informed citizens, to be prepared for college and careers, and to understand and appreciate the mathematic world.

A special thank you to the following individuals for their hard work and dedication who have served on the District 6-12 Math Subject Area Committee.

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Glenwood Community Middle School  
6th Grade Math Curriculum  
Approved Date – June 2020

<b>Course ID:</b>	<b>Course Purpose:</b> The student in sixth grade math will apply conceptual understanding of ratios; dividing fractions and rational numbers, including negative numbers; measurements of geometric shapes; will write, interpret and evaluate expressions to solve problems; and develop a conceptual understanding of statistical thinking.
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Course Outcomes	Outcome Components	Description	Iowa Core
<b>Ma.6.1</b>	<b>*Essential</b>	<b>The student will interpret and compute quotients of fractions and solve word problems involving division of fractions by fractions by creating a model or applying the algorithm.</b>	<b>6.NS.A</b>
	Ma.6.1.1	Divide a simple fraction by a simple fraction by drawing a model or applying the algorithm ( $\frac{1}{2} \div \frac{1}{8}$ ).	6.NS.A.1
	Ma.6.1.2	Divide a mixed number by a proper fraction and/or mixed number drawing a model or applying the algorithm.	6.NS.A.1
	Ma.6.1.3	Create an equation from a given story problem and solve using a model or algorithm.	6.NS.A.1
	Ma.6.1.4	Create a story context for a given division of fractions problem.	6.NS.A.1
<b>Ma.6.2</b>	<b>*Essential</b>	<b>The student will compute by applying the standard algorithm for addition, subtraction, multiplication, and division with multi-digit numbers and decimals while applying these skills to solve real-world problems, and find/list common factors and multiples for a pair of numbers. (Note: This outcome is ongoing throughout the year)</b>	<b>6.NS.B</b>
	Ma.6.2.1	Divide multi-digit numbers using standard algorithm.	6.NS.B.2
	Ma.6.2.2	Add multi-digit decimal problems using standard algorithms.	6.NS.B.3
	Ma.6.2.3	Subtract multi-digit decimal problems using standard algorithms.	6.NS.B.3
	Ma.6.2.4	Multiply multi-digit decimal problems using standard algorithms.	6.NS.B.3
	Ma.6.2.5	Divide multi-digit decimal problems using standard algorithms.	6.NS.B.3
	Ma.6.2.6	Find/list common factors for a pair of numbers from 0-100.	6.NS.B.4
	Ma.6.2.7	Find/list common multiples for a pair of numbers 0-12.	6.NS.B.4
<b>Ma.6.3</b>	<b>*Essential</b>	<b>The student will describe a ratio relationship and apply strategies and reasoning to solve real-life problems including unit rate, rate and percent.</b>	<b>6.RP.A</b>
	Ma.6.3.1	Identify a ratio statement and write the ratio in 3 ways.	6.RP.A.1
	Ma.6.3.2	Complete a ratio table, graph the ratios on a coordinate plane and interpret the graph to compare ratios and identify equivalent ratios.	6.RP.A.2 & 3
	Ma.6.3.3	Create a double number line, a proportion by scaling up or down, or a tape diagram to solve for a missing ratio or to find an equivalent ratio.	6.RP.A.3
	Ma.6.3.4	Apply ratio strategies to solve unit rate problems including those involving unit pricing and constant speed.	6.RP.A.2 & 3
	Ma.6.3.5	Apply ratio strategies to convert measurement units.	6.RP.A.3
	Ma.6.3.6	Apply ratio strategies to find the percent, part or whole in a real-life problem identifying what is missing.	6.RP.A.3
<b>Ma.6.4</b>	<b>*Essential</b>	<b>The student will interpret, order, and graph integers and rational numbers applying and extending their understanding to the coordinate plane while applying to solve real-world problems.</b>	<b>6.NS.C</b>
	Ma.6.4.1	Interpret real-life statements using an integer and explain the meaning of zero for each.	6.NS.C.5
	Ma.6.4.2	Identify and represent a number and its opposite on a number line.	6.NS.C.6
	Ma.6.4.3	Represent, interpret, and order positive and negative integers and rational numbers using number lines and inequality statements.	6.NS.C.6c. a
	Ma.6.4.4	Write, interpret, and explain statements of order for rational numbers in real-world contexts.	6.NS.C.7b
	Ma.6.4.5	Describe, define and interpret absolute value in a real-world situation.	6.NS.C.7c & d

	Ma.6.4.6	Identify when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes and identify the correct quadrant based on the signs of the ordered pairs.	6.NS.C.6b
	Ma.6.4.7	Identify, reflect and position pairs of integers and other rational numbers on a coordinate plane.	6.NS.C.6c
	Ma.6.4.8	Solve real-world problems by graphing on the coordinate plane and applying absolute value to find distance between two points.	6.NS.C.8 6.G.A.3
<b>Ma.6.5</b>	<b>The student will apply a formula to calculate the area of special quadrilaterals and triangles using those areas to decompose and compose an irregular polygon to find its area and solve real-world problems involving area, surface area and volume.</b>		<b>6.G.A</b>
	Ma.6.5.1	Calculate the area of right triangles, other triangles, special quadrilaterals, and polygons by decomposing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real- world and mathematical problems.	6.G.A.1
	Ma.6.5.2	Calculate the volume of a right rectangular prism with fractional sides.	6.G.A.2
	Ma.6.5.3	Draw polygons in the coordinate plane. Find the distance between two-points (absolute value) and apply to solve a real-world situation.	6.G.A.3 6.NS.C.8
	Ma.6.5.4	Represent three-dimensional figures using nets made up of rectangles and triangles.	6.G.A.4
	Ma.6.5.5	Calculate the surface area of prisms and pyramids by drawing a net while applying the context to a real-world problem.	
<b>Ma.6.6</b>	<b>*Essential The student will write, interpret and evaluate numerical and algebraic expressions for a given problem and apply properties of operations to create equivalent expressions to solve problems.</b>		<b>6.EE.A</b>
	Ma.6.6.1	Write and evaluate numerical expressions involving whole–number exponents applying the Order of Operations.	
	Ma.6.6.2	Write, interpret, and evaluate algebraic expressions from real-world problems such as area and volume formulas.	
	Ma.6.6.3	Apply the properties of operations to generate equivalent expressions. (Distributive Property)	6.EE.3&4
<b>Ma.6.7</b>	<b>*Essential The student will create and solve one variable equations and inequalities from a given story context.</b>		<b>6.EE.B</b>
	Ma.6.7.1	Solve an equation or inequality using substitution to determine whether a given number in a specified set makes an equation or inequality true.	6.EE.5
	Ma.6.7.2	Solve one-step equations and inequalities.	6.EE.7
	Ma.6.7.3	From a given story context, determine a variable and write an equation to solve the problem.	6.EE.6&7
	Ma.6.7.4	Write an inequality to represent a constraint or condition in a real-world or mathematical problem. Represent solutions of such inequalities on number line diagrams.	6.EE.8
<b>Ma.6.8</b>	<b>*Essential The student will create, solve and graph equations from a real world question by identifying independent/dependent variables, creating a table and graphing solutions on the coordinate plane.</b>		<b>6.EE.9</b>
	Ma.6.8.1	Identify the independent and dependent variables for a given problem.	6.EE.9
	Ma.6.8.2	For a given story context, create an equation with an independent and dependent variable.	6.EE.9
	Ma.6.8.3	Create a table and solution set for a given equation and graph those solutions on the coordinate plane.	6.EE.9
	Ma.6.8.4	For a given story context, create an equation, create a table and graph the solution set on the coordinate plane labeling all parts of the graph correctly.	6.EE.9
<b>Ma.6.9</b>	<b>The student will summarize, measure and display data with statistical variability.</b>		
	Ma.6.9.1	Identify a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.	6.SP.1
	Ma.6.9.2	Calculate mean, median and mode for a set of data.	6.SP.2
	Ma.6.9.3	Calculate the standard deviation of a set of data.	6.SP.3

	Ma.6.9.4	Create a dot plot, histogram, and box plot for a given set of data.	6.SP.4
	Ma.6.9.5	Interpret and summarize information displayed on a histogram, dot plot and box plot.	6.SP.5

Glenwood Community Middle School  
7<sup>th</sup> Grade Math Curriculum  
Approved Date – June 2020

<b>Course ID:</b> MA.7	<b>Course Purpose:</b> The student in seventh grade will apply conceptual understanding to quantify proportional relationships between rational numbers and integers, shapes of the same and different dimensions, and members of the same and different populations.
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Course Outcomes	Outcome Components	Description	Iowa Core
<b>MA.7.1</b>	<b>*Essential</b> <b>The student will evaluate expressions using addition, subtraction, multiplication, and division of rational numbers while applying them to solve real world problems.</b>		
	MA.7.1.1	Solve problems with adding and subtracting rational numbers.	7.NS.A.1
	MA.7.1.2	Solve problems with multiplying and dividing rational numbers.	7.NS.A.2
	MA.7.1.3	Solve real-world problems involving operations with rational numbers.	7.NS.A.3
	MA.7.1.4	Solve problems with adding, subtracting, multiply, and dividing integers.	7.NS.A.1
	MA.7.1.5	Determine whether the solution will be positive or negative when adding, subtracting, multiplying, or dividing rational numbers.	7.NS.A.1
	MA.7.1.6	Write the absolute value of a given number.	7.NS.A.1
	MA.7.1.7	Demonstrate and draw a subtraction and addition model by using manipulatives.	7.NS.A.1
<b>MA.7.2</b>	<b>*Essential</b> <b>The student will evaluate algebraic and numerical expressions with rational numbers by applying the distributive property and factoring.</b>		
	MA.7.2.1	Apply properties of operations as strategies to factor linear expressions with rational coefficients.	7.EE.A.1
	MA.7.2.2	Apply properties of the distributive property to expand linear expressions with rational coefficients.	7.EE.A.1
	MA.7.2.3	Create an expression from a given situation, and solve for the variable in the given table.	7.EE.A.2
	MA.7.2.4	Evaluate expressions by substituting in a given value for x, and simplify by utilizing the order of operations.	7.EE.A.2
	MA.7.2.5	Create equivalent expressions by combining like terms.	7.EE.A.2
<b>MA.7.3</b>	<b>*Essential</b> <b>The student will evaluate and solve real world mathematical problems by applying numerical and algebraic equations and inequalities.</b>		
	MA.7.3.1	Solve two-step equations with rational numbers.	7.EE.B.3
	MA.7.3.2	Solve two-step inequalities with rational numbers, and graph the solution on a number line.	7.EE.B.3
	MA.7.3.3	Solve and interpret real-world mathematical problems while applying equations and inequalities.	7.EE.B.4
<b>MA.7.4</b>	<b>The student will apply the formulas of circumference and area to solve real-world mathematical problems.</b>		
	MA.7.4.1	Solve problems by applying the formulas for circumference and area of a circle.	7.G.B.4
	MA.7.4.2	Solve for the diameter or radius of a circle when given the circumference.	7.G.B.4
	MA.7.4.3	Apply the area formulas to solve real world problems involving composite figures.	7.G.B.4
	MA.7.4.4	Interpret a real world problem by deciding whether to use the area or circumference of a circle.	7.G.B.4

	MA.7.4.5	Identify, label, and draw parts of a circle (diameter and radius).	7.G.B.4
	MA.7.4.6	Identify the circumference and area formulas.	7.G.B.4
<b>MA 7.5</b>	<b>*Essential</b> <b>The student will calculate and apply unit rates from ratios of fractions and solve problems involving proportions.</b>		
	MA 7.5.1	Calculate unit rates associated with ratios of whole numbers and fractions.	7.RP.A.1
	MA 7.5.2	Compare and contrast complex ratios of whole numbers and fractions.	7.RP.A.1
	MA 7.5.3	Represent unit rates using tables and graphs.	7.RP.A.1
	MA 7.5.4	Construct proportional relationships to solve multi-step real world problems.	7.RP.A.1
	MA 7.5.5	Solve unit rates with integers.	7.RP.A.1
<b>MA 7.6</b>	<b>*Essential</b> <b>The student will analyze properties of proportional relationships by applying constant proportionality to solve real world problems.</b>		
	MA 7.6.1	Evaluate the constant of proportionality by testing for equivalent ratios in a table.	7.RP.A.2.a
	MA 7.6.2	Create equations using the constant of proportionality to represent proportional relationships.	7.RP.A.2.c
	MA 7.6.3	Evaluate the constant of proportionality by testing equivalent ratios in a graph presented on a coordinate plane.	7.RP.A.2.b
	MA 7.6.4	Compare characteristics of proportional relationship graphs and scenarios.	7.RP.A.2.d
	MA 7.6.5	Determine whether two quantities are in a proportional relationship, given a table of values.	7.PR.A.2
	MA 7.6.6	Determine whether two quantities are in a proportional relationship, given a graph on a coordinate plane.	7.PR.A.2
	MA 7.6.7	Identify the constant of proportionality in given equations.	7.PR.A.2
<b>MA 7.7</b>	<b>*Essential</b> <b>The student will construct and evaluate markups, markdowns, and scale factors by applying the percent proportions and/or equations to real world scenarios.</b>		
	MA 7.7.1	Solve problems involving proportional reasoning to find commission.	7.RP.A.3
	MA 7.7.2	Apply multi step problems with markups and markdowns by applying proportional reasoning.	7.RP.A.3
	MA 7.7.3	Solve problems by applying multi step proportional reasoning to find percent increase and percent decrease.	7.RP.A.3
	MA 7.7.4	Analyze a table and apply proportional reasoning to find sales tax and the price of items including sales tax.	7.RP.A.3
	MA 7.7.5	Apply proportional reasoning to solve problems involving scale drawings/similar geometric figures with more than one missing side length.	7.G.A.1
	MA 7.7.6	Apply the formula for simple interest to solve real world problems.	7.RP.A.3
	MA 7.7.7	Solve problems involving proportional reasoning to calculate tips.	7.RP.A.3
<b>MA 7.8</b>	<b>The student will analyze mathematical problems involving triangle and angle relationships.</b>		
	MA 7.8.1	Construct triangles when given different side and angle measurements.	7.G.A.2
	MA 7.8.2	Identify the possible side lengths that form a triangle when given two sides.	7.G.A.2
	MA 7.8.3	Explain whether one, none, or many triangles will be formed when given different side lengths.	7.G.A.2
	MA 7.8.4	Solve for missing angles using complementary, supplementary, vertical, and adjacent angles.	7.G.B.5

	MA 7.8.5	Justify if a triangle can be formed from 3 side lengths.	7.G.A.2
	MA 7.8.6	Construct a given angle measurement with a protractor, and identify whether the angle is obtuse, acute, or a right angle.	7.G.B.5
	MA 7.8.7	Identify complementary, supplementary, vertical, and adjacent angles.	
<b>MA 7.9</b>	<b>The student will apply surface area and volume of 3-D objects to real world context.</b>		
	MA 7.9.1	Calculate the volume of pyramids.	7.G.B.6
	MA 7.9.2	Calculate surface area using the formula.	7.G.B.6
	MA 7.9.3	Solve for volume or surface area in a real-world problem.	7.G.B.6
	MA 7.9.4	State the figure that is formed from a cross section of a 3-D figure.	7.G.A.3
	MA 7.9.5	Solve for the volume of prisms.	7.G.B.6
	MA 7.9.6	Solve for surface area using nets.	7.G.B.6
	MA 7.9.7	State the figure that a net represents.	7.G.B.6
<b>MA 7.10</b>	<b>The student will investigate chance processes and develop, calculate, and evaluate probability models.</b>		
	MA 7.10.1	Approximate the probability of an event, while recalling that probability is between 0 and 1.	7.SP.C.7 7.SP.C.5
	MA 7.10.2	Create the sample space for an event and use it to predict outcomes.	7.SP.C.7
	MA 7.10.3	Calculate theoretical and experimental probability of an event.	7.SP.C.6
	MA 7.10.4	Calculate probabilities of compound events using lists, tables, tree diagrams, and simulation.	7.SP.C.8
	MA 7.10.5	Design a simulation to generate frequencies for compound events and calculate their probabilities.	7.SP.C.8
	MA 7.10.6	Determine the probability of simple events.	7.SP.C.5
	MA 7.10.7	Identify the sample space and theoretical probability of a compound event.	7.SP.C.8
<b>MA 7.11</b>	<b>The student will draw inferences about a population and informal comparative inferences about two populations by applying random sampling.</b>		
	MA 7.11.1	Identify valid representative samples of a population.	7.SP.B.3
	MA 7.11.2	Draw inferences about a population from a sample.	7.SP.C.2
	MA 7.11.3	Calculate the measures of center and measures of variability for two different populations.	7.SP.B.4
	MA 7.11.4	Apply measure of center and measures of variability of random samples to draw informal inferences about two populations.	7.SP.B.3
	MA 7.11.5	Identify if the data collected was a population or a sample.	7.SP.C.2

Glenwood Community Middle School  
8th Grade Math Curriculum  
Approved Date – June 2020

<b>Course ID:</b> MA.8	<b>Course Purpose:</b> The student in 8th Math will apply conceptual understanding to solve linear equations, analyze their uses, solve systems of linear equations, interpret data and spatial relationships, prove the Pythagorean Theorem for use to find lengths, and use and analyze congruence and similarity of geometric figures.
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Course Outcomes	Outcome Components	Description	Iowa Core
<b>MA.8.1</b>	<b>*Essential</b> <b>The student will evaluate and solve one variable equations and inequalities while applying inverse operations in the context of mathematical and real-world problems.</b>		
	MA.8.1.1	Solve one and two-step equations using inverse operations (add/subtract, multiply/divide).	8.EE.C.7
	MA.8.1.2	Distribute and combine like terms to simplify expressions.	8.EE.C.7
	MA.8.1.3	Solve one and two-step inequalities using inverse operations and graph the solutions on a number line.	8.EE.C.7
	MA.8.1.4	Solve multi-step equations by combining like terms, the distributive property, and with variables on both sides.	8.EE.C.7.b
	MA.8.1.5	Justify whether a solution has one solution, no solution, or infinite solutions.	8.EE.C.7.a
	MA.8.1.6	Solve multi-step inequalities where you multiply or divide by a negative.	8.EE.C.7
<b>MA.8.2</b>	<b>*Essential</b> <b>The student will evaluate operations with scientific notation while applying the properties of integer exponents in mathematical context and real-world problems.</b>		
	MA.8.2.1	Identify the base and exponent of a power and write it in expanded form.	8.EE.A.1
	MA.8.2.2	Simplify basic expressions applying the product, quotient, power, zero, or negative exponent properties.	8.EE.A.1
	MA.8.2.3	Convert numbers from scientific notation to standard form and standard form to scientific notation.	8.EE.A.3
	MA.8.2.4	Simplify complex expressions while applying multiple properties of exponents.	8.EE.A.1
	MA.8.2.5	Apply multiplication, division, addition, and subtraction to numbers in scientific notation.	8.EE.A.4
<b>MA.8.3</b>	<b>*Essential</b> <b>The student will graph and interpret the rate of change in proportional and non-proportional relationships in the context of mathematical and real-world problems.</b>		
	MA.8.3.1	Identify the constant of proportionality from a table, graph, and equation.	8.EE.B.5
	MA.8.3.2	Explain the characteristics of a proportional relationship.	8.EE.B.5
	MA.8.3.3	Justify whether a relationship is proportional or non-proportional in a table, graph, and equation.	8.EE.B.5
	MA.8.3.4	Interpret the rate of change, restate as a unit rate, and explain the meaning in terms of the situation.	8.EE.B.5
	MA.8.3.5	Write the equation and graph a proportional relationship from a table.	8.EE.B.6
<b>MA.8.4</b>	<b>*Essential</b> <b>The student will write and evaluate linear functions in slope-intercept and point-slope form in the context of mathematical and real-world problems.</b>		
	MA.8.4.1	Identify whether relations are functions represented as a table, mapping, and graph.	8.F.A.1
	MA.8.4.2	Calculate the slope and y-intercept of a non-vertical line in the coordinate plane.	8.F.B.4
	MA.8.4.3	Calculate the slope from a table.	8.F.B.4
	MA.8.4.4	Write the equation of the line given the slope and y-intercept.	8.F.A.3



	MA.8.4.5	Write the equation in slope-intercept form from an input/output table.	8.F.A.3
	MA.8.4.6	Interpret the slope and y-intercept of a scenario.	8.F.B.4
	MA.8.4.7	Compare the slope of linear functions presented in different forms.	8.F.A.2
	MA.8.4.8	Write the equation of a line through two distinct points in point-slope form.	8.F.A.3
<b>MA.8.5</b>	<b>*Essential</b> <b>The student will analyze and solve pairs of simultaneous linear equations.</b>		
	MA.8.5.1	Determine the number of solutions in a linear system graphically and algebraically.	8.EE.C.8
	MA.8.5.2	Solve a system of equations by graphing.	8.EE.C.8
	MA.8.5.3	Solve a system of equations by substitution with distribution.	8.EE.C.8
	MA.8.5.4	Solve a system of equations by elimination with multiplication.	8.EE.C.8
<b>MA.8.6</b>	<b>The student will analyze scatter plots by justifying positive, negative, linear, and nonlinear relationships.</b>		
	MA.8.6.1	Determine if a scatter plot has positive, negative, or no correlation.	8.SP.A.1
	MA.8.6.2	Identify the line of best fit on a graph.	8.SP.A.2
	MA.8.6.3	Create a two-way frequency table.	8.SP.A.4
	MA.8.6.4	Determine if a situation has positive, negative, or no correlation.	8.SP.A.1
	MA.8.6.5	Calculate the line of best fit ( $y=mx+b$ ) using two points.	8.SP.A.3
	MA.8.6.6	Calculate percentages in a two-way frequency table.	8.SP.A.4
<b>MA.8.7</b>	<b>*Essential</b> <b>The student will apply the Pythagorean Theorem to find the hypotenuse and leg of a right triangle and the distance between two points on a coordinate plane in the context of mathematical and real-world problems.</b>		
	MA.8.7.1	Approximate the square root of non-perfect squares (irrational number).	8.NS.A.2
	MA.8.7.2	Apply the Pythagorean Theorem to find the hypotenuse and leg of a right triangle.	8.G.B.7
	MA.8.7.3	Calculate the distance between two points on a coordinate plane (by creating right triangles).	8.G.B.8
	MA.8.7.4	Apply the Pythagorean Theorem to solve real world problems (finding the hypotenuse and leg).	8.G.B.7
	MA.8.7.5	Justify the converse of the Pythagorean theorem.	8.G.B.6
	MA.8.7.6	Calculate the distance between two ordered pairs using the distance formula.	8.G.B.8
<b>MA.8.8</b>	<b>*Essential</b> <b>The student will apply translations, rotations, reflections, and dilations to verify congruence and similarity through manipulation of geometric figures on a coordinate plane.</b>		
	MA.8.8.1	Identify congruent figures and define congruence.	8.G.A.3
	MA.8.8.2	Identify a single transformation to move a preimage to image: translations, rotations, reflections on geometric figures.	8.G.A.3
	MA.8.8.3	Perform translations and reflections of a geometric figure on the coordinate plane.	8.G.A.3
	MA.8.8.4	Write congruence statements about the angles and sides of geometric figures.	8.G.A.1
	MA.8.8.5	Apply rotations and dilations to a pre-image on the coordinate plane.	8.G.A.3
<b>MA.8.9</b>	<b>The student will apply angle relationships and triangle theorems to determine angle measures in the context of mathematical and real-world problems.</b>		
	MA.8.9.1	Identify vertical, complementary, supplementary angles and linear pairs.	8.G.A.5
	MA.8.9.2	Identify alternate interior, alternate exterior, same-side interior, same-side exterior, corresponding angles created when two (non-parallel) lines are cut by a transversal.	8.G.A.5
	MA.8.9.3	Calculate the missing interior angle by applying the triangle sum theorem.	8.G.A.5
	MA.8.9.4	Calculate missing angle measures using different angle types that occur when parallel lines are cut by a transversal.	8.G.A.5
	MA.8.9.5	Calculate the missing interior and exterior angle applying the triangle sum and exterior angle theorems.	8.G.A.5
<b>MA.8.10</b>	<b>The student will apply formulas involving volume of cones, cylinders, and spheres to</b>		

<b>solve real-world applications.</b>			
MA.8.10.1	Identify the radius, diameter, and height of cylinders, cones, and spheres.		8.G.C.9
MA.8.10.2	Identify the formula for the volume of a cylinder, cone, and sphere.		8.G.C.9
MA.8.10.3	Calculate the volume of a cylinder, cone, and sphere.		8.G.C.9
MA.8.10.4	Calculate the volume of a composition of cones, cylinders, and/or spheres.		8.G.C.9

Glenwood Community Middle School  
Algebra 1 for 8th Grade Curriculum  
Approved Date – June 2020

<b>Course ID:</b>	<b>Course Purpose:</b> This course is designed as the building block for High School mathematics. The student will have had 8th grade math prior to taking this course to prepare them for Algebra 1. They will apply conceptual understanding to demonstrate use of patterns, relations, and functions of linear, and exponential equations; represent and analyze mathematical situations using algebraic symbols; use mathematical models to represent and understand quantitative relationships; analyze change in various contexts; and apply concepts to solve real world problems.
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Course Outcomes	Outcome Components	Description	Iowa Core
<b>MA.AI.8.1</b>	<b>*Essential</b> <b>The student will evaluate operations with scientific notation while applying the properties of integer exponents in mathematical context and real-world problems.</b>		
	MA.AI.8.1.1	Identify the base and exponent of a power and write it in expanded form.	8.EE.A.1
	MA.AI.8.1.2	Simplify basic expressions applying the product, quotient, power, zero, or negative exponent properties.	8.EE.A.1
	MA.AI.8.1.3	Convert numbers from scientific notation to standard form and standard form to scientific notation.	8.EE.A.3
	MA.AI.8.1.4	Simplify complex expressions while applying multiple properties of exponents.	8.EE.A.1
	MA.AI.8.1.5	Apply multiplication, division, addition, and subtraction to numbers in scientific notation.	8.EE.A.4
<b>MA.AL.8.2</b>	<b>*Essential</b> <b>The student will apply the Pythagorean Theorem to find the hypotenuse and leg of a right triangle and the distance between two points on a coordinate plane in the context of mathematical and real-world problems.</b>		
	MA.AI.8.2.1	Approximate the square root of non-perfect squares (irrational number).	8.NS.A.2
	MA.AI.8.2.2	Apply the Pythagorean Theorem to find the hypotenuse and leg of a right triangle.	8.G.B.7
	MA.AI.8.2.3	Calculate the distance between two points on a coordinate plane (by creating right triangles).	8.G.B.8
	MA.AI.8.2.4	Apply the Pythagorean Theorem to solve real world problems (finding the hypotenuse and leg).	8.G.B.7
	MA.AI.8.2.5	Justify the converse of the Pythagorean theorem.	8.G.B.6
	MA.AI.8.2.6	Calculate the distance between two ordered pairs using the distance formula.	8.G.B.8
<b>MA.AI.8.3</b>	<b>*Essential</b> <b>The student will compare and contrast multiple representations of linear equations and identify key features.</b>		
	MA.AI.8.3.1	Identify the slope, y-intercept, and x-intercept given linear equations in standard, slope-intercept, and point-slope form.	A-SSE.A.1
	MA.AI.8.3.2	Graph linear equations given standard, slope-intercept, and point-slope form.	A-CED.A.4
	MA.AI.8.3.3	Create linear equations given a graph, table, and scenario.	A-CED.A
	MA.AI.8.3.4	Compare and contrast parallel and perpendicular equations of lines.	G-GPE.B
	MA.AI.8.3.5	Construct an equation of a perpendicular and parallel line given an equation.	G-GPE.B
<b>MA.AI.8.4</b>	<b>*Essential</b> <b>The student will create linear functions while applying concepts to determine solutions for real world scenarios.</b>		
	MA.AI.8.4.1	Evaluate functions using function notation.	F-IF.A
	MA.AI.8.4.2	Create expressions using rate of change and starting value.	F-IF.B
	MA.AI.8.4.3	Analyze tables and graphs to determine functionality and rate of change.	F-IF.B
	MA.AI.8.4.4	Compare linear functions using tables, graphs, equations, and scenarios.	A-CED.A.2
<b>MA.AI.8.5</b>	<b>The student will predict trends in data using linear regression characteristics represented in various forms.</b>		
	MA.AI.8.5.1	Construct a graph of a line of best fit and write an equation.	S-ID.B
	MA.AI.8.5.2	Interpret the meaning of the slope and y-intercept using a graph, equation, and scenario.	S-ID.C.7
	MA.AI.8.5.3	Interpret the correlation coefficient with relation to the graph and scenario.	S-ID.C.8
	MA.AI.8.5.4	Compare correlation and causation in context to the situation.	S-ID.C.9

<b>MA.AI.8.6</b>	<b>*Essential</b>		
	<b>The student will compare and contrast multiple representations of exponential functions while real world scenarios.</b>		
	MA.AI.8.6.1	Convert between rational exponents and radical expressions.	N.RN.A
	MA.AI.8.6.2	Write exponential functions given a table, graph, and situation.	A-CED.A
	MA.AI.8.6.3	Analyze key characteristics of exponential functions and their graphs.	F-IFC.9
	MA.AI.8.6.4	Apply exponential functions to solve compound interest scenarios.	F-LE.A.2 A-SSE.B.4
	MA.AI.8.6.5	Identify key characteristics of growth and decay in exponential functions.	F-LE.A.1
<b>MA.AI.8.7</b>	<b>*Essential</b>		
	<b>The student will analyze one and two variable inequalities given real world scenarios and identify solutions using multiple methods.</b>		
	MA.AI.8.7.1	Solve one variable inequalities algebraically and graph the solution on a number line.	A-REI.B.3
	MA.AI.8.7.2	Apply properties of solving one variable equations to inequalities.	A-REI.A
	MA.AI.8.7.3	Apply properties of graphing using standard and slope intercept form to graph two variable inequalities.	A-REI.D
	MA.AI.8.7.4	Write one and two variable inequalities given a real world scenario.	A-REI.D
<b>MA.AI.8.8</b>	<b>*Essential</b>		
	<b>The student will algebraically construct systems of equations and inequalities given real world situations and evaluate.</b>		
	MA.AI.8.8.1	Solve systems of equations using the substitution method and elimination method.	A-REI.C
	MA.AI.8.8.2	Graph systems of equations and systems of inequalities.	A-REI.D
	MA.AI.8.8.3	Compare the number of solutions to systems of equations and inequalities algebraically and graphically.	A-REI.D.11
	MA.AI.8.8.4	Create equations for systems of equations and inequalities given multiple representations.	A-CED.A
<b>MA.AI.8.9</b>	<b>*Essential</b>		
	<b>The student will apply properties and characteristics of geometric figures on the coordinate plane to solve real-life problems.</b>		
	MA.AI.8.9.1	Determine the distance and the midpoint between two points on the coordinate plane.	G-CO.A.1
	MA.AI.8.9.2	Calculate the area and perimeter of composite figures in the coordinate plane.	G-GPE.B.7
	MA.AI.8.9.3	Classify triangles and quadrilaterals and justify with written and algebraic support.	G-GPE.B.4
	MA.AI.8.9.4	Create geometric constructions of segments, angles, and simple 2-dimensional shapes using geometric tools.	G-CO.D
	MA.AI.8.9.5	Calculate perimeter and area of polygons in the coordinate plane while applying to real world scenarios.	G-GPE.B.7
<b>MA.AI.8.10</b>	<b>The student will analyze and apply rigid motion transformations to verify congruence and construct geometric figures inscribed in a circle.</b>		
	MA.AI.8.10.1	Describe the transformation(s) on a preimage to obtain a specific image.	G-CO.B
	MA.AI.8.10.2	Construct triangles, squares, and regular hexagons inscribed in a circle using geometric tools.	G-CO-D
	MA.AI.8.10.3	Transform figures by translating, reflecting, dilating, and rotating and write a function in geometric notation to represent the transformation.	G-CO.A
	MA.AI.8.10.4	Justify congruence of triangles using rigid motion transformations, Euclidean geometry, and theorems.	G-CO.B
<b>MA.AI.8.11</b>	<b>*Essential</b>		
	<b>The student will analyze one-variable and two-variable statistics to compare multiple representations of the data while applying to real world scenarios.</b>		
	MA.AI.8.11.1	Graphically represent one-variable statistics using histograms, box-and-whisker plots, and dot plots.	S-ID.A.1
	MA.AI.8.11.2	Determine the best representation of data using mean, median, mode, and standard deviation.	S-ID.A.2
	MA.AI.8.11.3	Analyze multiple representations of one-variable data and compare the measures of central tendency.	S-ID.A
	MA.AI.8.11.4	Create and interpret marginal, relative, and conditional frequency distributions.	S-CP.A.4

	MA.AI.8.11.5	Compare two-variable frequency distributions and make conclusions based on the data representations.	S-ID.B
	MA.AI.8.11.6	Analyze measures of central tendency while applying to real world scenarios.	S-ID.A.2

Glenwood Community High School  
Algebra 1 Curriculum  
Approved Date – June 2020

<b>Course ID: MA.AI</b>	<b>Course Purpose:</b> This course is designed as the building block for High School mathematics. The student will have had 8th grade math prior to taking this course to prepare them for Algebra 1. They will apply conceptual understanding to demonstrate use of patterns, relations, and functions of linear, and exponential equations; represent and analyze mathematical situations using algebraic symbols; use mathematical models to represent and understand quantitative relationships; analyze change in various contexts; and apply concepts to solve real world problems.
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Course Outcomes	Outcome Components	Description	Iowa Core
<b>MA.AI.1</b>	<b>*Essential</b> <b>The student will compare and contrast multiple representations of linear equations and identify key features.</b>		
	MA.AI.1.1	Identify the slope, y-intercept, and x-intercept given linear equations in standard, slope-intercept, and point-slope form.	A-SSE.A.1
	MA.AI.1.2	Graph linear equations given standard, slope-intercept, and point-slope form.	A-CED.A.4
	MA.AI.1.3	Create linear equations given a graph, table, and scenario.	A-CED.A
	MA.AI.1.4	Compare and contrast parallel and perpendicular equations of lines.	G-GPE.B.5
	MA.AI.1.5	Construct an equation of a perpendicular and parallel line given an equation.	G-GPE.B
<b>MA.AI.2</b>	<b>*Essential</b> <b>The student will create linear functions while applying concepts to determine solutions for real world scenarios.</b>		
	MA.AI.2.1	Evaluate functions using function notation.	F-IF.A
	MA.AI.2.2	Create expressions using rate of change and starting value.	F-IF.B
	MA.AI.2.3	Analyze tables and graphs to determine functionality and rate of change.	F-IF.B
	MA.AI.2.4	Compare linear functions using tables, graphs, equations, and scenarios.	A-CED.A.2
<b>MA.AI.3</b>	<b>The student will predict trends in data using linear regression characteristics represented in various forms.</b>		
	MA.AI.3.1	Construct a graph of a line of best fit and write an equation.	S-ID.B
	MA.AI.3.2	Interpret the meaning of the slope and y-intercept using a graph, equation, and scenario.	S-ID.C.7
	MA.AI.3.3	Interpret the correlation coefficient with relation to the graph and scenario.	S-ID.C.8
	MA.AI.3.4	Compare correlation and causation in context to the situation.	S-ID.C.9
<b>MA.AI.4</b>	<b>*Essential</b> <b>The student will compare and contrast multiple representations of exponential functions while real world scenarios.</b>		
	MA.AI.4.1	Convert between rational exponents and radical expressions.	N.RN.A
	MA.AI.4.2	Write exponential functions given a table, graph, and situation.	A-CED.A
	MA.AI.4.3	Analyze key characteristics of exponential functions and their graphs.	F-IFC.9
	MA.AI.4.4	Apply exponential functions to solve compound interest scenarios.	F-LE.A.2 A-SSE.B.4
	MA.AI.4.5	Identify key characteristics of growth and decay in exponential functions.	F-LE.A.1
<b>MA.AI.5</b>	<b>*Essential</b> <b>The student will analyze one and two variable inequalities given real world scenarios and identify solutions using multiple methods.</b>		
	MA.AI.5.1	Solve one variable inequalities algebraically and graph the solution on a number line.	A-REI.B.3
	MA.AI.5.2	Apply properties of solving one variable equations to inequalities.	A-REI.A
	MA.AI.5.3	Apply properties of graphing using standard and slope intercept form to graph two variable inequalities.	A-REI.D
	MA.AI.5.4	Write one and two variable inequalities given a real world scenario.	A-REI.D
<b>MA.AI.6</b>	<b>*Essential</b> <b>The student will algebraically construct systems of equations and inequalities given real world</b>		

	<b>situations and evaluate.</b>		
	MA.AI.6.1	Solve systems of equations using the substitution method and elimination method.	A-REI.C
	MA.AI.6.2	Graph systems of equations and systems of inequalities.	A-REI.D
	MA.AI.6.3	Compare the number of solutions to systems of equations and inequalities algebraically and graphically.	A-REI.D.11
	MA.AI.6.4	Create equations for systems of equations and inequalities given multiple representations.	A-CED.A
<b>MA.AI.7</b>	<b>*Essential The student will apply properties and characteristics of geometric figures on the coordinate plane to solve real-life problems.</b>		
	MA.AI.7.1	Determine the distance and the midpoint between two points on the coordinate plane.	G-CO.A.1
	MA.AI.7.2	Calculate the area and perimeter of composite figures in the coordinate plane.	G-GPE.B.7
	MA.AI.7.3	Classify triangles and quadrilaterals and justify with written and algebraic support.	G-GPE.B.4
	MA.AI.7.4	Create geometric constructions of segments, angles, and simple 2-dimensional shapes using geometric tools.	G-CO.D
	MA.AI.7.5	Calculate perimeter and area of polygons in the coordinate plane while applying to real world scenarios.	G-GPE.7
<b>MA.AI.8</b>	<b>The student will analyze and apply rigid motion transformations to verify congruence and construct geometric figures inscribed in a circle.</b>		
	MA.AI.8.1	Describe the transformation(s) on a preimage to obtain a specific image.	G-CO.B
	MA.AI.8.2	Construct triangles, squares, and regular hexagons inscribed in a circle using geometric tools.	G-CO-D
	MA.AI.8.3	Transform figures by translating, reflecting, dilating, and rotating and write a function in geometric notation to represent the transformation.	G-CO.A
	MA.AI.8.4	Justify congruence of triangles using rigid motion transformations, Euclidean geometry, and theorems.	G-CO.B
<b>MA.AI.9</b>	<b>*Essential The student will analyze one-variable and two-variable statistics to compare multiple representations of the data while applying to real world scenarios.</b>		
	MA.AI.9.1	Graphically represent one-variable statistics using histograms, box-and-whisker plots, and dot plots.	S-ID.A.1
	MA.AI.9.2	Determine the best representation of data using mean, median, mode, and standard deviation.	S-ID.A.2
	MA.AI.9.3	Analyze multiple representations of one-variable data and compare the measures of central tendency.	S-ID.A
	MA.AI.9.4	Create and interpret marginal, relative, and conditional frequency distributions.	S-CP.A.4
	MA.AI.9.5	Compare two-variable frequency distributions and make conclusions based on the data representations.	S-ID.B
	MA.AI.9.6	Analyze measures of central tendency while applying to real world scenarios.	S-ID.B

Glenwood Community High School  
 Geometry - Math Curriculum  
 Approved Date – June 2020

<b>Course ID:</b> MA.G	<b>Course Purpose:</b> The student will in geometry apply conceptual understanding to the properties of triangles, geometric constructions, properties of polygons and circles, and to prove geometric theorems to solve mathematical and real-world problems.
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Course Outcomes	Outcome Components	Description	Iowa Core
<b>MA.G.1</b>	<b>*Essential</b>	<b>The student will apply and prove geometric theorems and postulates.</b>	
	MA.G.1.1	Write the hypothesis, conclusion, and converse of a conditional statement.	
	MA.G.1.2	Solve algebraic problems involving angle relationships (adjacent angles, linear pairs, vertical angles, supplementary angles, and complementary angles).	G-CO.C.9
	MA.G.1.3	Apply theorems and postulates involving angle relationships created by parallel lines cut by a transversal to real world scenarios.	G-CO.C.9
	MA.G.1.4	Apply common postulates and properties (segment addition and angle addition postulates, reflexive property, transitive property, substitution property) to mathematical problems.	G-CO.C.9
	MA.G.1.5	Create proofs of theorems using common properties, definitions, postulates and theorems by applying a variety of methods.	G-CO.C.9
<b>MA.G.2</b>		<b>The student will apply congruence to properties and characteristics of common 2-dimensional plane figures to solve mathematical problems.</b>	
	MA.G.2.1	Classify quadrilaterals and triangles using the coordinates of the vertices on the coordinate plane.	G-GPE.B4
	MA.G.2.2	Apply Theorems of Quadrilaterals and Triangles to solve problems involving 2-dimensional plane figures.	G-CO.C.10 G-CO.C.11
	MA.G.2.3	Solve for missing sides and angles in a complex diagram involving 2-dimensional plane figures.	G-CO.C.10 G-CO.C.11
	MA.G.2.4	Analyze figures to determine congruence or what information is missing to determine congruency.	G-CO.B.6
	MA.G.2.5	Identify and apply congruence theorems to solve problems involving geometric figures.	G-CO.B.8
	MA.G.2.6	Create a proof showing Corresponding Parts of Congruent Triangles are Congruent (CPCTC) using appropriate theorems, postulates, properties, and definitions.	G-CO.B.7
<b>MA.G.3</b>		<b>The student will analyze and apply similarity to solve problems involving and comparing geometric figures.</b>	
	MA.G.3.1	Identify and apply the AA, SAS, and SSS similarity theorems to solve problems involving geometric figures.	G-SRT.A.3 G-SRT.A.5
	MA.G.3.2	Identify corresponding proportional sides and congruent angles from similar triangles.	G-SRT.A.2
	MA.G.3.3	Apply theorems (angle bisector, proportional side, Hypotenuse Leg) to solve multi-step problems involving geometric figures.	G-SRT.B.4 G-SRT.C.6
	MA.G.3.4	Apply similar triangles and proportional reasoning concepts to solve complex and real-world problems.	G-SRT.B.5
	MA.G.3.5	Determine a given trigonometric ratio for an acute angle in a right triangle.	G-SRT.C.6
	MA.G.3.6	Utilize the relationship between the sine and cosine of complementary angles to solve problems.	G-SRT.C.7
	MA.G.3.7	Solve for all the missing measurements of a triangle in a real world scenario.	G-SRT.D.11
<b>MA.G.4</b>		<b>The student will apply properties and characteristics of circles (arc measures, chords, secants, tangents, central angles, etc.) to solve multi-step problems on the coordinate plane.</b>	



	MA.G.4.1	Solve problems involving angle and arc measures created by chords, secants, and tangents of a circle.	G-C.A.5 G-C.A.4
	MA.G.4.2	Apply arc length and area of a sector formulas to solve for missing information.	G-C.A.5
	MA.G.4.3	Solve problems involving inscribed or circumscribed polygons.	G-C.A.2 G-C.A.3
	MA.G.4.4	Apply properties of circles to solve multi-step problems.	G-C.A.2
	MA.G.4.5	Create a proof that justifies that all circles are similar.	G-C.A.1
<b>MA.G.5</b>	<b>The student will apply probability concepts to compute probabilities of compound events and make a determination about an outcome in real-world situations.</b>		
	MA.G.5.1	Construct and interpret two-way frequency tables of data.	S-CP.A.4
	MA.G.5.2	Interpret data by applying the concepts of conditional probability and independence in a real-world situation.	S-CP.A
	MA.G.5.3	Compute probabilities of compound events and solve problems by utilizing rules of probability (Addition/Multiplication Rule, permutations/combinations).	S-CP.B
	Ma.G.5.4	Apply probability concepts to outcomes based on expected values.	S-MD.B
<b>MA.G.6</b>	<b>The student will graph and apply properties of linear functions (e.g. absolute value functions and linear piecewise functions) to real world scenarios.</b>		
	MA.G.6.1	Evaluate absolute value expressions and linear piecewise functions to determine a numerical value.	A-REI.B.3
	MA.G.6.2	Apply and describe transformations to the graphs and equations of absolute value functions.	F-FB-B.1
	MA.G.6.3	Solve absolute value equations and inequalities and graph their solutions on a number line.	A-REI.B.3
	MA.G.6.4	Construct and graph linear piecewise functions while applying real world scenarios.	F-IF.C
<b>MA.G.7</b>	<b>The student will apply properties of exponents and exponential functions to graphs and to solve mathematical and real world problems.</b>		
	MA.G.7.1	Convert between rational exponents in radical notation.	N.RN.A
	MA.G.7.2	Simplify radical expressions by extracting perfect squares.	A-REI.A.2
	MA.G.7.3	Compare simple and compound interest with linear and exponential functions.	F-LE.A.2
	MA.G.7.4	Apply exponential growth and decay to real world scenarios.	F-IF.C.8 F-LE.A.1
<b>MA.G.8</b>	<b>The student will analyze graphs of quadratic functions to identify key characteristics and write equations of quadratics in various forms.</b>		
	MA.G.8.1	Apply first and second differences to determine if a table represents a quadratic function.	F-IF.C
	MA.G.8.2	Compare quadratic graphs and quadratic equations in factored, standard, and vertex form.	F-IF.C
	MA.G.8.3	Construct a quadratic equation from given information and justify which form would be most efficient to utilize.	F-IF.C
	MA.G.8.4	Create a sketch of the graph of a quadratic equation in various forms.	F-IF.C.7
	MA.G.8.5	Analyze graphs and equations of quadratic functions to identify the key characteristics. (e.g. domain, range, zeros, y-intercept, vertex)	F-IF.B4
<b>MA.G.9</b>	<b>The student will apply algebraic properties of real and complex numbers and various methods to solve quadratic equations.</b>		
	MA.G.9.1	Solve a quadratic equation using various methods (e.g. box, diamond) to find binomial factors.	A-REI.B
	MA.G.9.2	Factor the greatest common factor out of a polynomial.	A-SSE.B3
	MA.G.9.3	Justify why polynomials are closed sets under addition, subtraction, and multiplication	A-APR.A
	MA.G.9.4	Determine the real and/or complex zeros of a quadratic function by graphing, factoring, and the quadratic formula.	A-REI.B.4

	MA.G.9.5	Justify whether a quadratic function has real, imaginary, or a double root utilizing the discriminant.	N.CN.C.7
	MA.G.9.6	Perform addition, subtraction, and multiplication on polynomials and complex numbers.	N-CN.A.2

Glenwood Community High School  
Algebra 2 Curriculum  
Approved Date – June 2020

<b>Course ID:</b> <b>MA.A2</b>	<b>Course Purpose:</b> The student in Algebra 2 will identify key characteristics of quadratic functions, as well as write and solve quadratic equations. They will extend their knowledge of quadratic functions to higher degree polynomial functions. The student will identify key characteristics of exponential and logarithmic functions, as well as solve equations. Additionally, they will demonstrate knowledge of periodic functions, the use of trig identities, and the unit circle.
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Course Outcomes	Outcome Components	Description	Iowa Core
<b>MA.A2.1</b>	<b>*Essential</b> <b>The student will apply properties of quadratics to solve, graph, and rewrite quadratic functions in standard, factored, and vertex forms.</b>		
	MA.A2.1.1	Construct the graph of a quadratic function identifying the key characteristics of the function.	A-CED.A.2 F-IF.C.7
	MA.A2.1.2	Solve for the zeros of a function by applying the methods of factoring, the quadratic formula, completing the square, and the square root method.	A-SSE.B.3a A-REI.B.4b A-REI.A.1 F-IF.C.8a
	MA.A2.1.3	Write a quadratic equation in standard, factored, and vertex forms when given key characteristics.	F-BF.A.1 A-SSE.A.2
	MA.A2.1.4	Calculate the axis of symmetry and vertex of a quadratic function in both standard and factored forms.	F-IF.C.7
	MA.A2.1.5	State the key characteristics that can be found from the different forms of quadratic functions.	A-SSE.A.2
	MA.A2.1.6	Solve a quadratic system of equations by substitution, elimination, or graphing.	A-REI.C.5
	MA.A2.1.7	Apply transformations to the equations and graphs of quadratic functions.	F-BF.B.3
<b>MA.A2.2</b>	<b>*Essential</b> <b>The student will analyze two-dimensional and three-dimensional figures while applying their properties and characteristics to real world scenarios.</b>		
	MA.A2.2.1	Model and solve real world scenarios using two- and three-dimensional figures.	GMD.B.4
	MA.A2.2.2	Apply rotations to two-dimensional plane figures to create three-dimensional solids.	GMD.B.4
	MA.A2.2.3	Create a sketch and describe multiple cross sections of three-dimensional figures (Spheres, Prisms, Cylinders, Cones, etc.).	GMD.B.4
	MA.A2.2.4	Identify the three-dimensional figure that results from a description of its cross sections.	GMD.B.4
	MA.A2.2.5	Create a drawing of a solid with given cross sections.	GMD.B.4
<b>MA.A2.3</b>	<b>*Essential</b> <b>The student will examine polynomial functions to identify their characteristics and simplify them using operational properties.</b>		
	MA.A2.3.1	Create sketches for graphs of various polynomials utilizing the knowledge of zeros, extrema, and degree then identify the domain and range.	F-IF.C.7c
	MA.A2.3.2	Classify polynomial functions as even or odd degree with positive or negative end-behaviors.	F-IF.B.4 F-IF.C.7c
	MA.A2.3.3	Apply multiple factoring techniques to polynomials in different forms.	F-IF.C.8
	MA.A2.3.4	Determine relative and absolute maximums and minimums of a polynomial function graphically and algebraically.	F-IF.C.7a
	MA.A2.3.5	Apply the Fundamental Theorem of Algebra to determine the zeros of a polynomial function.	N-CN.C.8
	MA.A2.3.6	Determine the product of higher degree polynomials, write the function in standard form, and describe the key characteristics.	A-APR.A.1
	MA.A2.3.7	Apply division to polynomials using long division or synthetic division to determine the quotient.	A-CED.A.4
	MA.A2.3.8	Calculate all linear factors and construct the graph of polynomial functions while applying the remainder theorem, factor theorem, methods of factoring, and polynomial division.	A-APR.B.2 A-APR.B.3 A-SSE.A.2
	MA.A2.3.9	Apply transformations to the graphs and equations of polynomials.	F-IF.C.7c

			F-BF.B.3
<b>MA.A2.4</b>	<b>*Essential</b> <b>The student will apply properties of rational functions to graphs and real world scenarios.</b>		
	MA.A2.4.1	Create a sketch of graphs of rational functions by algebraically identifying their key characteristics (domain, range, vertical asymptotes, horizontal asymptotes, y-intercepts).	F-IF.C.7d
	MA.A2.4.2	Identify discontinuities algebraically and graphically and classify them as removable or infinite (asymptotic).	A-CED.A.3 A-REI.A.2
	MA.A2.4.3	Perform addition, subtraction, multiplication, and division on rational expressions.	A-APR.D.7
	MA.A2.4.4	Solve rational equations and identify extraneous solutions.	A-REI.A.2
	MA.A2.4.5	Apply rational equations to real world scenarios involving work, mixture, distance, and cost.	N-Q.A.2
	MA.A2.4.6	Apply transformations to the graphs and equations of rational functions.	F-IF.C.7d
<b>MA.A2.5</b>	<b>The student will apply inverse relationships to power and radical functions to solve, write, and graph equations.</b>		
	MA.A2.5.1	Justify whether a function is an invertible function by applying the Horizontal Line Test.	F-BF.B.4c
	MA.A2.5.2	Create a sketch of a graph for square root and cube root functions and state the domain and range.	F-IF.B.5 F-IF.C.7b
	MA.A2.5.3	Apply addition, subtraction, multiplication and division to simplify two or more radical expressions.	N-RN.B.3
	MA.A2.5.4	Solve radical equations algebraically.	A-REI.A.2
	MA.A2.5.5	Apply transformations to the equations and graphs of square root and cube root functions.	F-IF.B.5 F-IF.C.7b
<b>MA.A2.6</b>	<b>*Essential</b> <b>The student will solve, convert, and graph exponential and logarithmic equations while applying them to real world scenarios.</b>		
	MA.A2.6.1	Apply exponential equations to real world scenarios involving growth and decay as well as finance and continuously compounded interest.	F-IF.C.8b
	MA.A2.6.2	Create a sketch of a graph for exponential and logarithmic functions by utilizing domain, range, asymptotes, intercepts, and end behavior.	F-IF.C.7e
	MA.A2.6.3	Convert an equation between exponential and logarithmic forms.	F-BF.B.5
	MA.A2.6.4	Solve exponential and logarithmic equations.	F-LE.A.4
	MA.A2.6.5	Apply transformations to the equations and graphs of exponential and logarithmic functions.	F-IF.C.7e
<b>MA.A2.7</b>	<b>The student will identify and apply key characteristics of trigonometric functions on the unit circle to evaluate, graph, and solve real world scenarios.</b>		
	MA.A2.7.1	Convert central angles of a unit circle between degree and radian measures.	F-TF.A.1
	MA.A2.7.2	Identify key characteristics of periodic functions from a graph and write their equations.	F-TF.A.4
	MA.A2.7.3	Apply the Law of Sines and Law of Cosines to solve mathematical models and real world scenarios.	F-TF.A.2 F-TF.B.5
	MA.A2.7.4	Construct graphs of trigonometric functions (Sine, Cosine, and Tangent) and their transformations.	F-IF.C.7e
<b>MA.A2.8</b>	<b>*Essential</b> <b>The student will analyze and compare data sets using properties of normal distributions while applying them to real world scenarios.</b>		
	MA.A2.8.1	Apply the Empirical Rule for normal distributions.	S-ID.A.4
	MA.A2.8.2	Solve for percent and percentiles using z-score tables or technology.	S-ID.A.4
	MA.A2.8.3	Solve and interpret standard deviations given real world scenarios.	S-ID.A.4 S-MD.A.4
<b>MA.A2.9</b>	<b>The student will apply sampling methods and observational studies to make inferences about populations in real world scenarios.</b>		
	MA.A2.9.1	Differentiate between sample surveys, observational studies, or experiments and identify the key characteristics. (ex: interest, population, sample size, confounding factors, bias, etc.).	S-IC.A.1 S-IC.B.3
	MA.A2.9.2	Design a data collection plan for real world scenarios while justifying ways to prevent bias.	S-IC.B.3
	MA.A2.9.3	Perform a simple random sample utilizing sampling methods. (ex: convenience, subjective, volunteer, stratified random, cluster, systematic, etc.).	S-IC.A.2

	MA.A2.9.4	Solve for the standard deviation of a population mean to reach a confidence interval of 95%.	S-ID.A.4
	MA.A2.9.5	Determine a margin of error and whether or not the results are statistically significant based on given parameters and provide written justification for the results.	S-IC.A.2

Glenwood Community High School  
 Trig/Pre-Calculus Curriculum  
 Approved Date – June 2020

<b>Course ID:</b> <b>MA.TPC</b>	<b>Course Purpose:</b> The student in Trig/Pre-Calc will apply the concepts of the unit circle and right triangles to graph and solve real world problems. The student will identify conics, solve systems of equations, and use logarithms to solve equations. The student will find derivatives and integrals.
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Course Outcomes	Outcome Components	Description	Iowa Core
<b>MA.TPC.1</b>	<b>*Essential</b> <b>The student will algebraically solve for and prove key characteristics of functions and analyze the graphical behavior while applying to real world scenarios.</b>		
	MA.TPC.1.1	Identify key features (domain, range, zeros, y-intercept, intervals of increase and decrease, continuity, vertical asymptotes, horizontal asymptotes, boundedness, relative and absolute extrema, symmetry, end behavior) of the graphs of functions.	
	MA.TPC.1.2	Solve for key features (domain, zeros, y-intercept, vertical asymptotes, horizontal asymptotes, continuity, symmetry, end behavior) of the graphs of functions.	
	MA.TPC.1.3	Prove algebraically whether a function is even, odd, or neither.	
	MA.TPC.1.4	Apply operations (addition, subtraction, multiplication, division, and compositions) to functions.	
	MA.TPC.1.5	Determine a formula for the inverse of a function and provide algebraic and written justification on whether or not the inverse is a function.	
	MA.TPC.1.6	Write and apply functions to real world scenarios.	
<b>MA.TPC.2</b>	<b>*Essential</b> <b>The student will apply properties of rational and polynomial functions to solve real world applications and algebraically find key characteristics of each of these functions to sketch their graphs.</b>		
	MA.TPC.2.1	Solve rational equations and inequalities and provide written justification with algebraic support on whether solutions are real or extraneous.	
	MA.TPC.2.2	Model real world scenarios with rational equations and inequalities and interpret the findings.	
	MA.TPC.2.3	Apply polynomial equations and inequalities to real world scenarios (ex: projectile motion).	
	MA.TPC.2.4	Construct graphs of polynomial functions, power functions, and rational functions from key features (domain, zeros, y-intercept, vertical asymptote, horizontal asymptote, slant asymptote, end behavior).	
	MA.TPC.2.5	Solve algebraically for points of discontinuities and provide written justification for the classification of the type of discontinuity (Infinite/Asymptotic, Removable/Point, Jump).	
	MA.TPC.2.6	Apply power functions to real world scenarios involving variation.	
<b>MA.TPC.3</b>	<b>*Essential</b> <b>The student will solve exponential, logarithmic, and logistic equations while applying to real world scenarios.</b>		
	MA.TPC.3.1	Apply exponential, logarithmic, and logistic functions to real world scenarios involving finance.	
	MA.TPC.3.2	Solve exponential, logarithmic, and logistic equations and provide written justification as to whether or not the solution(s) is extraneous.	
	MA.TPC.3.3	Apply logarithmic properties to simplify and expand single and multiple logarithms.	
	MA.TPC.3.4	Model real world scenarios by applying exponential growth and decay.	
<b>MA.TPC.4</b>	<b>*Essential</b> <b>The student will apply right triangle trigonometry and period trigonometry to graphs and real world applications.</b>		
	MA.TPC.4.1	Apply the arc length formula to find the radius, arc length, or the central angle.	
	MA.TPC.4.2	Solve right triangle trigonometric applications.	
	MA.TPC.4.3	Create a sketch for the graphs of sine, cosine, tangent, secant, cosecant, and cotangent using amplitude, period, and frequency.	
	MA.TPC.4.4	Solve real world applications involving inverse trigonometric functions.	
	MA.TPC.4.5	Apply reference angles and the unit circle to evaluate the value of trigonometric functions.	

<b>MA.TPC.5</b>	<b>*Essential</b>		
	<b>The student will apply trigonometric identities and the Law of Sines and the Law of Cosines to solve complex trigonometric equations, prove equality of two trigonometric expressions, and solve real world applications.</b>		
	MA.TPC.5.1	Solve trigonometric equations using trigonometric identities and formulas. (Pythagorean identity, double angle formula, angle addition formula, angle subtraction formula, and half angle formula).	
	MA.TPC.5.2	Solve for missing parts of triangles by applying the Law of Sines and Law of Cosines.	
	MA.TPC.5.3	Apply the Law of Sines and Law of Cosines to real world scenarios.	
	MA.TPC.5.4	Prove equality of trigonometric expressions algebraically by applying identities and properties to manipulate one of the expressions and provide a written justification for each step.	
<b>MA.TPC.6</b>	<b>The student will apply properties of polar and parametric equations to graphs and real world scenarios.</b>		
	MA.TPC.6.1	Perform operations (addition, subtraction, dot product, magnitude) on vectors.	
	MA.TPC.6.2	Convert between polar and rectangular coordinates.	
	MA.TPC.6.3	Create a sketch for the graphs of polar and parametric equations.	
	MA.TPC.6.4	Apply polar equations and parametric equations to solve real world problems.	
	MA.TPC.6.5	Analyze vectors in space using distance between points, midpoint of segments, and writing equations to represent them.	
<b>MA.TPC.7</b>	<b>The student will apply operations of matrices to solve real world problems involving systems of equations.</b>		
	MA.TPC.7.1	Apply operations (addition, subtraction, scalar multiplication) to matrices.	
	MA.TPC.7.2	Apply multiplication properties to matrices or justify why a given product is not possible.	
	MA.TPC.7.3	Justify whether or not two matrices are inverses.	
	MA.TPC.7.4	Apply the determinant to calculate the inverse of a matrix.	
	MA.TPC.7.5	Evaluate the determinant of a matrix.	
	MA.TPC.7.6	Apply matrix techniques (Gaussian Elimination, Inverse Matrices, and Reduced Row Echelon Form) to solve systems of equations.	
	MA.TPC.7.7	Apply properties of matrices to solve real world scenarios (ex: equilibrium points).	
<b>MA.TPC.8</b>	<b>The student will apply parabolas, ellipses, and hyperbolas in two and three dimensions algebraically and graphically and convert between various representations of equations of conics while applying real world scenarios.</b>		
	MA.TPC.8.1	Solve for the vertex, focus, directrix, and focal width of a parabola and utilize it to sketch a graph.	
	MA.TPC.8.2	Solve algebraically for the center, vertices, and foci of conics and utilize it to sketch the graph.	
	MA.TPC.8.3	Create an equation for conics (parabolas, ellipses, and hyperbolas) in standard form from given information.	
	MA.TPC.8.4	Justify which type of conic a second-degree equation represents by applying the Discriminant Test and provide a written justification.	
	MA.TPC.8.5	Convert quadratic equations with cross-product terms to equations without cross-product terms applying axis rotation formulas.	
	MA.TPC.8.6	Write and graph polar equations for conics with given focus, eccentricity, and directrix.	
	MA.TPC.8.7	Apply conics to real world scenarios.	

Glenwood Community High School  
Calculus Curriculum  
Approved Date – June 2020

<b>Course ID:</b> MA.CA	<b>Course Purpose:</b> The student in calculus will apply the use of differential and integral calculus to solve real world problems.
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Course Outcomes	Outcome Components	Description	Iowa Core
<b>MA.CA.1</b>	<b>*Essential</b> <b>The student will evaluate limits graphically or justify why they do not exist, describe the continuity of the graph, and provide algebraic justification.</b>		
	MA.CA.1.1	Estimate limits graphically or explain why they do not exist and provide algebraic justification.	
	MA.CA.1.2	Apply algebraic manipulations to find the value, if it exists, of a limit in indeterminate form.	
	MA.CA.1.3	Evaluate limits (one-sided, two-sided, and infinite) algebraically.	
	MA.CA.1.4	Evaluate one-sided limits and provide written justification for whether or not the two-sided limit exists.	
	MA.CA.1.5	Describe the continuity of a graph and provide algebraic justification.	
<b>MA.CA.2</b>	<b>*Essential</b> <b>The student will apply methods of differentiation for polynomial, radical, rational, trigonometric, exponential, and logarithmic functions to justify the preferred method.</b>		
	MA.CA.2.1	Differentiate functions using the power rule, product rule, quotient rule, chain rule, and general power rule.	
	MA.CA.2.2	Differentiate trigonometric functions.	
	MA.CA.2.3	Differentiate complex functions by applying logarithmic differentiation.	
	MA.CA.2.4	Differentiate functions by applying the limit definition of a derivative.	
	MA.CA.2.5	Differentiate functions of two variables by applying implicit differentiation.	
	MA.CA.2.6	Apply methods of differentiation to determine which method is most efficient with written justification.	
<b>MA.CA.3</b>	<b>*Essential</b> <b>The student will apply first derivatives, second derivatives, and key features algebraically to sketch the graphs of polynomial, rational, exponential, and logarithmic functions.</b>		
	MA.CA.3.1	Identify from a graph the intervals in which the first and second derivatives are positive and negative.	
	MA.CA.3.2	Solve algebraically for the key features (domain, zeros, y-intercept, vertical asymptote(s), horizontal asymptote(s), slant asymptote) of polynomial functions, rational functions, exponential functions, and logarithmic functions.	
	MA.CA.3.3	Solve for relative extrema and intervals of increase and decrease utilizing the first derivative.	
	MA.CA.3.4	Solve for inflection points and intervals of concavity utilizing the second derivative.	
<b>MA.CA.4</b>	<b>*Essential</b> <b>The student will apply differentiation techniques to optimize quantities in real world contexts.</b>		
	MA.CA.4.1	Demonstrate relationships between variables by writing equations and/or inequalities.	
	MA.CA.4.2	Apply differentiation techniques for optimization problems involving perimeter and area.	
	MA.CA.4.3	Apply differentiation techniques for optimization problems involving cost, revenue, and profit.	
	MA.CA.4.4	Apply differentiation techniques for optimization problems involving volume, surface area, and cost.	
<b>MA.CA.5</b>	<b>*Essential</b> <b>The student will apply differentiation techniques to applications in economics, physics, and related rates.</b>		
	MA.CA.5.1	Apply differentiation techniques to applications in economics involving marginal cost and revenue.	
	MA.CA.5.2	Apply differentiation techniques to applications in physics involving position, velocity, acceleration, and jerk.	



	MA.CA.5.3	Apply implicit differentiation to applications involving related rates.	
	MA.CA.5.4	Construct equations to represent the tangent and normal lines to curves at a given input value utilizing first derivatives.	
<b>MA.CA.6</b>	<b>*Essential</b> <b>The student will identify and provide a written justification for which technique of integration should be used and apply that technique to find the antiderivative for various functions.</b>		
	MA.CA.6.1	Evaluate definite and indefinite integrals.	
	MA.CA.6.2	Apply the technique of substitution to calculate the antiderivative of a function.	
	MA.CA.6.3	Apply the technique of integration by parts to calculate the antiderivative of a function.	
	MA.CA.6.4	Identify which technique to use for integrating a function and provide a written justification as to why this technique was chosen.	
	MA.CA.6.5	Solve improper integrals where either the upper or lower bounds are infinite quantities.	
<b>MA.CA.7</b>	<b>The student will apply algebraic integration to applications in economics, physics, average values, area, and volume.</b>		
	MA.CA.7.1	Construct an integral to algebraically find the area under a curve and evaluate that integral to find the numerical area.	
	MA.CA.7.2	Apply integration to solve economics problems.	
	MA.CA.7.3	Apply integration to solve physics problems involving position, velocity, acceleration, and jerk.	
	MA.CA.7.4	Construct an integral to algebraically find the area between two curves and evaluate that integral to find the numerical area.	
	MA.CA.7.5	Construct and evaluate an integral to represent the volume of a curve rotated about the x- or y- axis.	
	MA.CA.7.6	Apply definite integration to solve for the average value of a function.	
<b>MA.CA.8</b>	<b>The student will apply Calculus techniques of summations, limits, differentiation, and integration to infinite series.</b>		
	MA.CA.8.1	Identify whether an infinite series converges or diverges.	
	MA.CA.8.2	Construct a power series using differentiation and/or integration.	
	MA.CA.8.3	Construct MaClaurin polynomials and series using derivatives.	
	MA.CA.8.4	Construct Taylor polynomials and series using derivatives.	
	MA.CA.8.5	Apply infinite series to rewrite repeating decimals as a fraction.	

Glenwood Community High School  
Discrete Math with Statistics Curriculum  
Approved Date – June 2018

<b>Course ID:</b> <b>MA.DM</b>	<b>Course Purpose:</b> The student in Discrete Math with Statistics will explore set theory, graph theory, number theory, and matrices to work with data sets and apply it to real world situations. The student will also use sampling techniques to collect data, run simulations, make inferences, and present a summary of what they have learned.
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Course Outcomes	Outcome Components	Description	Iowa Core
<b>MA.DM.1</b>	<b>Set Theory - The student will perform operations with set theory as it pertains to logic, truth tables, and venn diagrams.</b>		
	MA.DM.1.1	Determine the truth value of mathematical and common statements by using conjunctions, disjunctions, and negations.	
	MA.DM.1.2	Will create truth tables to display the truth value of logic statements and their parts.	
	MA.DM.1.3	Will prove or disprove statements by using logical equivalence.	
	MA.DM.1.4	Use Venn diagrams to provide pictorial representations of sets, and apply the properties of sets and subsets to list the elements of the resultant set.	<b>HSS.CP.A.1</b>
<b>MA.DM.2</b>	<b>Matrices - The student will apply matrix operations and different properties to solve problems.</b>		
	MA.DM.2.1	Add, subtract, multiply by a scalar, and find the product of matrices.	
	MA.DM.2.2	Perform row operations on an augmented matrix to make it RREF to solve a system of equations.	
	MA.DM.2.3	Compute the inverse of a 2x2 matrix by hand and any square matrix with technology.	
	MA.DM.2.4	Apply Cramer's Rule to solve for a single (or all) variable(s) in a system of equations.	
	MA.DM.2.5	Construct a system of equations and solve that system using different matrix techniques.	
<b>MA.DM.3</b>	<b>Graph Theory - The student will optimize paths by applying graph theory.</b>		
	MA.DM.3.1	Design a graph based upon a picture or description of a situation.	
	MA.DM.3.2	Determine paths of various lengths of an undirected graph, and measure the length of a path in a weighted graph.	
	MA.DM.3.3	Represent a graph by using the adjacency matrix, and use the matrix to determine the degree of the vertices.	
	MA.DM.3.4	Apply the characteristics of an Euler/Hamilton path or circuit to determine the most efficient route.	
<b>MA.DM.4</b>	<b>Number Theory - The student will apply number theory as it pertains to counting techniques and probability.</b>		
	MA.DM.4.1	Determine when to use permutations versus combinations in order to solve counting/probability problems.	<b>HSS.CP.B.7</b> <b>HSS.CP.B.9</b>
	MA.DM.4.2	Determine the probability of a given scenario by discerning whether it represents conditional or mutually exclusive events.	<b>HSS.CP.A.2</b> <b>HSS.CP.A.3</b> <b>HSS.CP.B.6</b> <b>HSS.CP.B.8</b>
	MA.DM.4.3	Compute the expected value of events to make predictions and compare results.	<b>HSS.MD.A.2</b>
<b>MA.DM.5</b>	<b>Data Collection/ Sampling - The student will design and implement methods of unbiased data collection and sampling.</b>		
	MA.DM.5.1	Distinguish between a population and a sample.	
	MA.DM.5.2	Identify biased samples	
	MA.DM.5.3	Explain the importance of "representativeness" in forming a sample.	
	MA.DM.5.4	Explain the general relationship between sample size and size of a population.	
	MA.DM.5.5	Create a plan to gather information from a random/unbiased sample and defend the plan.	<b>HSS.IC.B.3</b>
<b>MA.DM.6</b>	<b>Summary &amp; Presentation - The student will determine the most effective ways to summarize and present data.</b>		
	MA.DM.6.1	Construct and compare different graphical representations of a set of data.	<b>HSS.ID.A.1</b>
	MA.DM.6.2	Construct and compare frequency and relative frequency tables of a set of data.	<b>HSS.ID.B.5</b>

	MA.DM.6.3	Compute and describe the mean, median, and mode of a set of data.	
	MA.DM.6.4	Identify the relative positions of the mean, median, and mode on various frequency distributions.	HSS.ID.A.2
	MA.DM.6.5	Determine the appropriate measure of central tendency for a set of data.	
	MA.DM.6.6	Calculate the variance and standard deviation of a set of data and investigate the relationship between the two.	
<b>MA.DM.7</b>	<b>Probability &amp; Simulation - The student will simulate and explore the probability of real world applications by utilizing simulation and theoretical models.</b>		
	MA.DM.7.1	Determine an appropriate simulation model for various studies.	
	MA.DM.7.2	Conduct a proper simulation of a given scenario, record the data, and use it to find the probability of the scenario.	
	MA.DM.7.3	Compare the probability of the results from a simulation to its theoretical probability and explain/defend any discrepancies.	
<b>MA.DM.8</b>	<b>Statistical Inference - The students will apply a testing technique to verify the validity of their test results.</b>		HSS.IC.A.2
	MA.DM.8.1	Describe, in terms of the mean and standard deviation, the z-score distributions.	
	MA.DM.8.2	Transform raw scores into corresponding z-scores be given a set of raw scores, transform them into corresponding standard z-scores.	
	MA.DM.8.3	Convert a set of z-scores into a distribution of standard scores with any given mean and standard deviation.	
	MA.DM.8.4	Calculate confidence intervals by using the characteristics of the normal curve.	HSS.ID.A.4
	MA.DM.8.5	Compose a probability statement by translating information about the confidence interval around a mean.	

Glenwood Community Middle School  
 Problem Solving Skills & Strategies Elective Curriculum  
 Approved Date – September 2020

<b>Course ID:</b>	<b>Course Purpose:</b> Strengthen your problem-solving and strategic skills through challenging games. Backgammon, Monopoly, Checkers, Connect Four, and Life, among others, are some of the games used to enhance logic, mental math, and creativity. Social skills such as working through a challenge in an appropriate way are stressed as students learn the politics of good sportsmanship.
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Course Outcomes	Outcome Components	Description	Iowa Core
<b>PS.8.1</b>	<b>The student will describe the benefits of how learning a game can improve logic, mathematical reasoning, and creativity skills.</b>		
	PS.8.1.1	Demonstrate declarative knowledge about the game including rules, vocabulary, objectives, & history.	
	PS.8.1.2	Explain how increased declarative and procedural knowledge is attained by practice, thinking, and self-reflection in games.	
	PS.8.1.3	Determine and identify the mathematical skills (such as probability) needed to enhance ability to succeed in games.	7.SP.C.6
<b>PS.8.2</b>	<b>The student will evaluate problem-solving and strategic skills associated with games.</b>		
	PS.8.2.1	Identify the three problem solving strategies (trial and error, algorithm, and heuristic) in games.	
	PS.8.2.2	Identify and describe a problem solving strategy in a specific game.	
	PS.8.2.3	Rank strategic skills necessary for successful participation in specific games.	
<b>PS.8.3</b>	<b>The student will justify use of problem solving strategies to demonstrate appropriate interactions with fellow players and opponents in game scenarios.</b>		
	PS.8.3.1	Identify the culture and social skills necessary for appropriate game play.	
	PS.8.3.2	Demonstrate and describe appropriate reactions to the thrill of victory and the agony of defeat when in a competitive simulation/situation.	
	PS.8.3.3	Explain ways in which feedback from oneself and others that can be used to improve the level of one's expertise in game playing.	
	PS.8.3.4	Explain the cause and effect related to specific problem solving strategies on the outcome of the game.	