MAGIC CITY ACCEPTANCE ACADEMY

7th Grade Math

1. The goal of this course is to provide the foundation of the state's Student Math practice skill mastery.
2. These skills are incorporated throughout all grades of secondary Math courses.
3. Students' mastery levels will either place students into Algebra 1 or Pre-Algebra in 8th grade.
4. The focus of Math 7 is split into five themed units that are all equal importance: Numbers and Operations, Algebra and functions, Proportional Reasoning, Data Analysis with Statistics and Probability, and Geometry and Measurement.
5. I will finish 1 unit before starting the next. I will also be using daily bellringers to introduce topics in future units or review them from prior units throughout the year. This way students get short 5 – 10-minute lessons and exposure on all topics prior to ACAP.

The state Student Path Practice Standards across all Math courses are

Student Mathematical Practices	
Make sense of problems and persevere in solving them.	Use appropriate tools strategically.
Reason abstractly and quantitatively.	Attend to precision.
Construct viable arguments and critique the reasoning of others.	Look for and make use of structure.
Model with mathematics.	8 Look for and express regularity in repeated reasoning

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Timeline	Unit/theme	Standard	Student Focused Objective	Resources/ Suggested Activities
	All topics will draw from the listed resources *Note that math and science will be integrated so resources may crossover in topic areas			AMSTI resources for 8th grade math https://www.amsti.org/68-math-student-family https://www.amsti.org/math-6-8-classroom Math Nation (Illustrative Math) (access thru https://www.clever.com/ with school email account) https://illustrativemathematics.org/ IXL online math (access thru https://www.clever.com/ with school email account) Delta Math https://www.deltamath.com/ Maneuvering the Middle math resources https://www.maneuveringthemiddl

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				e.com/ Math Worksheets for Kids https://www.mathworksheets4kids.com/ Use of card games like Math Flux **<u>Number Talks</u>** Book series Primary author is Sherry Parrish and for 1 book a co-author Ann Dominick
1st 9 weeks	**Numbers and Operations**	**7A-8: Apply and extend knowledge of operations of whole numbers, fractions, and decimals to add, subtract, multiply, and divide rational numbers including integers, signed fractions, and decimals.** a. Identify and explain situations where the sum of opposite quantities is 0 and opposite quantities are defined as additive inverses. b. Interpret the sum of two or more rational numbers, by using a number line and in real-world contexts	Students will +, -, x, and ÷ rational numbers, integers, fractions, and decimals Students will perform addition and subtraction with rational numbers and fractions to get to 0 Students will use a number to show addition and subtraction of rational numbers in math expressions and word problems.	

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		c. Explain subtraction of rational numbers as addition of additive inverses. d. Use a number line to demonstrate 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. e. Extend strategies of multiplication to rational numbers to develop rules for multiplying signed numbers, showing that the properties of the operations are preserved. f. Divide integers and explain that division by zero is undefined. Interpret the quotient of integers (with a non-zero divisor) as a rational number. g. Convert a rational number to a decimal using long division, explaining that the decimal form of a rational number terminates or eventually repeats.	Students will write subtraction problems with negative numbers as addition problems with negative numbers and solve them without a calculator Students model distance on a number line for rational numbers and absolute value of a number from 0 both as expressions and word problems. Students will multiple using positive and negative numbers including decimals and fractions. Students will divide using positive and negative numbers including decimals and fractions. Students will convert between decimals, fractions, and percents without the use of a calculator	

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1st 9 weeks	**Numbers and Operations**	**7A-9: Solve real-world and mathematical problems involving the four operations of rational numbers, including complex fractions. Apply properties of operations as strategies where applicable.**	Students will solve word problems with positive and negative numbers, including the order of operations problems	
1st 9 weeks	**Numbers and Operations**	**7A-10: Define the real number system as composed of rational and irrational numbers**. a. Explain that every number has a decimal expansion; for rational numbers, the decimal expansion repeats in a pattern or terminates. b. Convert a decimal expansion that repeats in a pattern into a rational number.	Students will classify types of numbers Students will write and rewrite a form of a number with decimals Students will convert decimals into an equivalent fraction	
	Numbers and Operations	7A-11: Locate rational approximations of irrational numbers on a number line, compare their sizes, and estimate the values of irrational numbers.	Students will round irrational numbers to the closest integer or rational number to the hundredths place	
	Numbers and Operations	**7A-12: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions**	Students will solve linear expressions using the order of operations	

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		with rational coefficients.		
	Numbers and Operations	**7A-13: Generate expressions in equivalent forms based on context and explain how the quantities are related.**	Students will create equivalent fractions to solve problems.	
	Algebra and functions	**7A-17: Solve multi-step real-world and mathematical problems involving rational numbers (integers, signed fractions, and decimals), converting between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies.**	Students will solve single, two-step, and multi-step equations.	
	Algebra and functions	**7A-18: Use variables to represent quantities in a real-world or mathematical problem and construct algebraic expressions, equations, and inequalities to solve problems by reasoning about the quantities.** a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the	Students will factor out a common factor and use the distributive property to make equivalent expression. Solve word problems that contain the distributive property.	

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		sequence of the operations used in each approach. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q,and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.	Students will use skills from equations to solve similar inequalities and graph the answer.	
	Algebra and functions	7A-21: Solve multi-step linear equations in one variable, including rational number coefficients, and equations that require using the distributive property and combining like terms. a. Determine whether linear equations in one variable have one solution, no solution, or infinitely many solutions of the form $x = a$, $a = a$, or $a = b$ (where a and b are different numbers). b. Represent and solve real-world and mathematical problems with equations and interpret each solution in the context of the problem.	Solve Multistep equations that require the distributive property Students will say if there is 1 answer, all answer or no answer to a math problem. Students will say if there is 1 answer, all answer or no answer to a math word problem.	

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	Algebra and functions	7A-14: Develop and apply properties of integer exponents to generate equivalent numerical and algebraic expressions.	Students find value for Exponents and make exponential numbers	
	Algebra and functions	7A-15: Use square root and cube root symbols to represent solutions to equations. a. Evaluate square roots of perfect squares (less than or equal to 225) and cube roots of perfect cubes (less than or equal to 1000). b. Explain that the square root of a non-perfect square is irrational.	Students can solve what the √ and cubed roots of a number are. Students can determine the √ of perfect squares 225 or less. Students know a number that's not perfect square goes on forever	
2nd 9 weeks	**Algebra and functions**	7A-16: Express and compare very large or very small numbers in scientific notation. a. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are	Students can make a number in standard form from scientific notation. Students can +, -, x, and ÷ using scientific notation.	

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		used, expressing answers in scientific notation. b. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. c. Interpret scientific notation that has been generated by technology. d. Interpret scientific notation that has been generated by technology.		
	Proportional Reasoning	**7A-1: Calculate unit rates of length, area, and other quantities measured in like or different units that include ratios or fractions.**	Students will create a rate and unit rate of 2 quantities	
	Proportional Reasoning	**7A-2: Represent a relationship between two quantities and determine whether the two quantities are related proportionally.** a. Use equivalent ratios displayed in a table or in a graph of the relationship in the coordinate plane to determine whether a relationship between two quantities is proportional.	Students will create equivalent ratios Students will tell if 2 proportions or fractions are equivalent	

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		b. Identify the constant of proportionality (unit rate) and express the proportional relationship using multiple representations including tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Explain in context the meaning of a point (x,y) on the graph of a proportional relationship, with special attention to the points (0,0) and (1, r) where r is the unit rate.	Students will figure out the rate of change using different methods Students will graph a line using a data table and a starting point and rate of change/slope.	
	Proportional Reasoning	**7A-3: Solve multi-step percent problems in context using proportional reasoning, including simple interest, tax, gratuities, commissions, fees, markups and markdowns, percent increase, and percent decrease**	Students will solve equations and functions to determine tax, interest, sale and mark ups.	
	Proportional Reasoning	7A-4: Determine whether a relationship between two variables is proportional or non-proportional.	Students will determine if 2 proportions are equal	

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	Proportional Reasoning	7A-7: Compare proportional and non-proportional linear relationships represented in different ways (algebraically, graphically, numerically in tables, or by verbal descriptions) to solve real-world problems.	Students solve proportion problems and proportion word problems	
	Proportional Reasoning	7A-5: Graph proportional relationships. a. Interpret the unit rate of a proportional relationship, describing the constant of proportionality as the slope of the graph which goes through the origin and has the equation y = mx where m is the slope.	Students can graph a function on a line using slope-intercept form	
3rd nine weeks	**Proportional Reasoning**	7A-6: Interpret y = mx + b as defining a linear equation whose graph is a line with m as the slope and b as the y-intercept. A Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in a coordinate plane. b. Given two distinct points in a coordinate plane, find the slope of	Students will graph a line. Students will visually model the slope of a line. Students will determine slope between	

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		the line containing the two points and explain why it will be the same for any two distinct points on the line. c. Graph linear relationships, interpreting the slope as the rate of change of the graph and the y-intercept as the initial value. d. Given that the slopes for two different sets of points are equal, demonstrate that the linear equations that include those two sets of points may have different y-intercepts	2 points. Students properly graph a line that crosses the y-axis. Students graph 2 lines to see where they cross.	
	Proportional Reasoning	7A-23: Construct a function to model the linear relationship between two variables. a. Interpret the rate of change (slope) and initial value of the linear function from a description of a relationship from two points in a table or graph	Students will create a graph of a line from a function table. Students will determine the function rule in a table.	
	Data Analysis with Statistics and Probability	7A-26: Examine a sample of a population to generalize information about the population.	Students will infer what a statistic/graph says about a sample shown	

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		a. Differentiate between a sample and a population. b. Compare sampling techniques to determine whether a sample is random and thus representative of a population, explaining that random sampling tends to produce representative samples and support valid inferences. c. Determine whether conclusions and generalizations can be made about a population based on a sample. d. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest, generating multiple samples to gauge variation and make predictions or conclusions about the population. e. Informally explain situations in which statistical bias may exist.	Compare and contrast definitions of sample and population. Students can tell different ways people sample a group for statistics. Students will tell if you can expect the same result in larger groups. Students can determine simple statistical info and draw it in different graph forms. Students can explain why a statistic is bias or could be biased.	
	Data Analysis with Statistics and Probability	7A-27: Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by	Students will draw different types of visual graphs to show data analysis.	

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		expressing it as a multiple of a measure of variability.		
4th nine weeks	**Data Analysis with Statistics and Probability**	7A-28: Make informal comparative inferences about two populations using measures of center and variability and/or mean absolute deviation in context.	Students solve for mean, median, mode, range.	
	Data Analysis with Statistics and Probability	7A-29: Use a number between 0 and 1 to represent the probability of a chance event occurring, explaining that larger numbers indicate greater likelihood of the event occurring, while a number near zero indicates an unlikely event.	Students determine the chance of something happening between 0 (never) and 1 (always)	
	Data Analysis with Statistics and Probability	7A-30: Define and develop a probability model, including models that may or may not be uniform, where uniform models assign equal probability to all outcomes and non-uniform models involve events that are not equally likely. a. Collect and use data to predict probabilities of events. b. Compare probabilities from a model to observe frequencies, explaining possible sources of discrepancy.	Students create graphs, histograms, box and whisker plots, etc. Students will predict what might happen based on data. Students will turn fractions and decimals into percents of chance	

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	Data Analysis with Statistics and Probability	7A-31: Approximate the probability of an event by using data generated by a simulation (experimental probability) and compare it to theoretical probability. a. Observe the relative frequency of an event over the long run, using simulation or technology, and use those results to predict approximate relative frequency.	Students can determine the percent chance of something happening. Students will predict what will happen based on simulations	
	Data Analysis with Statistics and Probability	7A-32: Find probabilities of simple and compound events through experimentation or simulation and by analyzing the sample space, representing the probabilities as percents, decimals, or fractions. a. Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams, and determine the probability of an event by finding the fraction of outcomes in the sample space for which the compound event occurred. b. Design and use a simulation to generate frequencies for compound events.	Students will determine the chance of 2-part events. Students will graphically show the chance of an event happening using different means. Use simulations to determine the chance of an event happening.	

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		c. Represent events described in everyday language in terms of outcomes in the sample space which composed the event.	Students verbally describe what happened or will happen based on sample data	
	Geometry and Measurement	7A-33: Solve problems involving scale drawings of geometric figures including computation of actual lengths and areas from a scale drawing and reproduction of a scale drawing at a different scale.	Students will use proportions to determine actual measurements.	
	Geometry and Measurement	7A-34: Construct geometric shapes (freehand, using a ruler and a protractor, and using technology) given measurement constraints with an emphasis 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.	Students will create triangles and other polygons based on partial measurements.	
	Geometry and Measurement	7A-35: Describe the two-dimensional figures created by slicing three-dimensional figures into plane sections.	Students will determine how to build 3D shapes using 2D shapes stuck together.	
	Geometry and Measurement	7A-36: Explain the relationships among circumference, diameter, area, and radius of a circle to demonstrate understanding of	Students explain what circumference, radius, and diameter are.	

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		formulas for the area and circumference of a circle. a. Informally derive the formula for area of a circle. b. Solve area and circumference problems in real-world and mathematical situations involving circles.	Students determine how the Area formula for a circle works. Students solve unknowns in circumference problems.	
	Geometry and Measurement	7A-37: Use facts about supplementary, complementary, vertical, and adjacent angles in multi-step problems to write and solve simple equations for an unknown angle in a figure.	Students determine the measurement of an angle using info about other ones.	
	Geometry and Measurement	7A-38: Analyze and apply properties of parallel lines cut by a transversal to determine missing angle measures. a. Use informal arguments to establish that the sum of the interior angles of a triangle is 180 degrees.	Students determine the degrees of angles from parallel lines and a transversal line. Students explain why all angles equal up to 180 degrees.	
	Geometry and Measurement	7A-39: 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 rectangular prisms.	Students will solve area, volume, and surface area of 2D and 3D shapes.	

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	Geometry and Measurement	7A-40: Informally derive the formulas for the volume of cones and spheres by experimentally comparing the volumes of cones and spheres with the same radius and height to a cylinder with the same dimensions.	Students will determine how formulas for cones and spheres are determined.	
	Geometry and Measurement	7A-41: Use formulas to calculate the volumes of three-dimensional figures to solve real-world problems.	Students solve Area, Volume, and Surface Area word problems.	
	Geometry and Measurement	7A-42: Verify experimentally the properties of rigid motions (rotations, reflections, and translations): lines are taken to lines, and line segments are taken to line segments of the same length; angles are taken to angles of the same measure; and parallel lines are taken to parallel lines. a. Given a pair of two-dimensional figures, determine if a series of rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are congruent; describe the transformation sequence that verifies a congruence relationship.	Students define what rotations, reflections, and translations are in 2D graphs. Students determine how a shape is changed or moved from original placement to new one.	

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	Geometry and Measurement	7A-43: Use coordinates to describe the effect of transformations (dilations, translations, rotations, and reflections) on two dimensional figures.	Students explain how to perform dilations, translations, rotations, and reflections for 2D figures	
	Geometry and Measurement	7A-44: Given a pair of two-dimensional figures, determine if a series of dilations and rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are similar; describe the transformation sequence that exhibits the similarity between them	Students will determine if 2 shapes are congruent or similar based on dilations, translations, rotations, and reflections.	