

7 Math Curriculum Map

1 st Semester	
Standards for Mathematical Practices (all year)	
<p><i>The Mathematical Practices describe the reasoning behaviors students should develop as they build an understanding of mathematics – the “habits of mind” that help students become mathematical thinkers. There are eight standards, which apply to all grade levels and conceptual categories. These mathematical practices describe how students should engage with the mathematics content for their grade level. Developing these habits of mind builds students’ capacity to become mathematical thinkers. These practices can be applied individually or together in mathematics lessons, and no particular order is required. In well-designed lessons, there are often two or more Mathematical Practices present.</i></p>	
<p>MP: Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals.</p> <ul style="list-style-type: none"> • MP.1 Make sense of problems and persevere in solving them. • MP.2 Reason abstractly and quantitatively. • MP.3 Construct viable arguments and critique the reasoning of others. • MP.4 Model with mathematics. • MP.5 Use appropriate tools strategically. • MP.6 Attend to precision. • MP.7 Look for and make use of structure. • MP.8 Look for and express regularity in repeated reasoning. 	
Unit 1: Making Relevant Connections with The Number System	Unit 2: Reasoning with Expressions, Equations, and Inequalities
5-6 weeks GMAS % = 0.20	5-6 weeks GMAS % = 0.48
<p>This unit builds upon the understanding of rational numbers developed in 6th grade, transitioning from exploring to ultimately formalizing rules for basic arithmetic operations (addition, subtraction, multiplication, and division) with rational numbers. Using both contextual and numerical problems, students explore arithmetic combinations of negative numbers and positive numbers. Students will explore the results of adding, subtracting, multiplying, and dividing pairs of numbers in context, leading to the generalization of rules. Rational numbers in different forms (integers, percents, fractions, and decimal numbers) should be used in computations and explorations.</p>	<p>Students build on what was learned in previous grades regarding mathematical properties (such as commutative, associative, and distributive properties) and conventions (such as order of operations), use these conventions and properties of operations to rewrite equivalent expressions, and interpret expressions in context. Students extend properties used with whole numbers to rational numbers in multiple formats (fractions and decimals). Students construct and solve equations and inequalities to solve contextual problems, and interpret solutions based on the context.</p>
<p>7.NR.1 - Solve relevant mathematical problems, including multistep problems, involving the four operations with rational numbers and quantities in any form (integers, percentages, fractions, and decimal numbers).</p>	<p>7.PAR.2 Use properties of operations, generate equivalent expressions and interpret the expressions to explain relevant situations.</p> <ul style="list-style-type: none"> • 7.PAR.2.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients

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- 7.NR.1.1 Show that a number and its opposite have a sum of 0 (are additive inverses). Describe situations in which opposite quantities combine to make 0.
 - 7.NR.1.2 Show and explain $p + q$ as the number located a distance $|q|$ from p , in the positive or negative direction, depending on whether q is positive or negative. Interpret sums of rational numbers by describing applicable situations.
 - 7.NR.1.3 Represent addition and subtraction with rational numbers on a horizontal or a vertical number line diagram to solve real-life problems.
 - 7.NR.1.4 Show and explain subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference and apply this principle in contextual situations.
 - 7.NR.1.5 Apply properties of operations, including part-whole reasoning, as strategies to add and subtract rational numbers
 - 7.NR.1.6 Make sense of multiplication of rational numbers using realistic applications.
 - 7.NR.1.7 Show and explain that integers can be divided, assuming the divisor is not zero, and every quotient of integers is a rational number.
 - 7.NR.1.8 Represent the multiplication and division of integers using a variety of strategies and interpret products and quotients of rational numbers by describing them based on the relevant situation.
 - 7.NR.1.9 Apply properties of operations as strategies to solve multiplication and division problems involving rational numbers represented in an applicable scenario
 - 7.NR.1.10 Convert rational numbers between forms to include fractions, decimal numbers and percents, using understanding of the part divided by the whole. Know that the decimal form of a rational number terminates in 0s or eventually repeats.
 - 7.NR.1.11 Solve multi-step contextual problems involving rational numbers, converting between forms as appropriate, and assessing the reasonableness of answers using mental computation and estimation strategies.
 - 7.PAR.2.2 Rewrite an expression in different forms from a contextual problem to clarify the problem and show how the quantities in it are related.
- 7.PAR.3 Represent authentic situations using equations and inequalities with variables; solve equations and inequalities symbolically, using the properties of equality.**
- 7.PAR.3.1 Construct algebraic equations to solve practical problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Interpret the solution based on the situation.
 - 7.PAR.3.2 Construct algebraic inequalities to solve problems, leading to inequalities of the form $px \pm q > r$, $px \pm q < r$, $px \pm q \leq r$, or $px \pm q \geq r$, where p , q , and r are specific rational numbers. Graph and interpret the solution based on the realistic situation that the inequalities represent.

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Learning Targets:

- Understand absolute values and ordering of rational numbers.
- Find sums of integers.
- Find sums of rational numbers.
- Find differences of integers.
- Find differences of rational numbers and find distances between numbers on a number line.
- Find products of integers.
- Find quotients of integers.
- Convert between different forms of rational numbers.
- Find products of rational numbers.
- Find quotients of rational numbers.
- Rewrite fractions, decimals, and percent using different representations.

Success Criteria:

- Graph rational numbers on a number line. Find the absolute value of a rational number.
- Use a number line to compare rational numbers.
- Explain how to model addition of integers on a number line.
- Find sums of integers by reasoning about absolute values.
- Explain why the sum of a number and its opposite is 0.
- Explain how to model addition of rational numbers on a number line.
- Find sums of rational numbers by reasoning about absolute values.
- Use properties of addition to efficiently add rational numbers.
- Explain how subtracting integers is related to adding integers.
- Explain how to model subtraction of integers on a number line.
- Find differences of integers by reasoning about absolute values.

Learning Targets:

- Simplify algebraic expressions.
- Find sums and differences of linear expressions.
- Apply the Distributive Property to generate equivalent expressions.
- Factor algebraic expressions.
- Write and solve equations using addition or subtraction.
- Write and solve equations using multiplication or division.
- Write and solve two-step equations.
- Write inequalities and represent solutions of inequalities on number lines.
- Write and solve inequalities using addition or subtraction.
- Write and solve inequalities using multiplication or division.
- Write and solve two-step inequalities.

Success Criteria:

- Identify terms and like terms of algebraic expressions.
- Combine like terms to simplify algebraic expressions.
- Write and simplify algebraic expressions to solve real-life problems.
- Explain the difference between linear and nonlinear expressions.
- Find opposites of terms that include variables.
- Apply properties of operations to add and subtract linear expressions.
- Explain how to apply the Distributive Property.
- Use the Distributive Property to simplify algebraic expressions.
- Identify the greatest common factor of terms, including variable terms.
- Use the Distributive Property to factor algebraic expressions.
- Write a term as a product involving a given factor.
- Apply the Addition and Subtraction Properties of Equality to produce equivalent equations.

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<ul style="list-style-type: none"> • Explain how to model subtraction of rational numbers on a number line. • Find differences of rational numbers by reasoning about absolute values. • Find distances between numbers on a number line. • Explain the rules for multiplying integers. • Find products of integers with the same sign. • Find products of integers with different signs. • Explain the rules for dividing integers. • Find quotients of integers with the same sign. • Find quotients of integers with different signs. • Explain the difference between terminating and repeating decimals. • Write fractions and mixed numbers as decimals. • Write decimals as fractions and mixed numbers. • Explain the rules for multiplying rational numbers. • Find products of rational numbers with the same sign. • Find products of rational numbers with different signs. • Explain the rules for dividing rational numbers. • Find quotients of rational numbers with the same sign. • Find quotients of rational numbers with different signs. • Write percent as decimals and decimals as percent. • Write fractions as decimals and percent. • Compare and order fractions, decimals, and percent. 	<ul style="list-style-type: none"> • Solve equations using addition or subtraction. • Apply equations involving addition or subtraction to solve real-life problems. • Apply the Multiplication and Division Properties of Equality to produce equivalent equations. • Solve equations using multiplication or division. • Apply equations involving multiplication or division to solve real-life problems. • Apply properties of equality to produce equivalent equations. • Solve two-step equations using the basic operations. • Apply two-step equations to solve real-life problems. • Write word sentences as inequalities. • Determine whether a value is a solution of an inequality. • Graph the solutions of inequalities.

2 nd Semester		
Unit 3: Exploring Ratios and Proportional Relationships	Unit 4: Making Relevant Connections with Geometry	Unit 5: Investigating Probability
Building on knowledge and understanding of rate and unit concepts, students use graphs, tables, equations,	Students will write and solve equations using facts involving measures of angles. Students will study circles	Students will begin an exploration of probability and chance processes. Students will develop probability

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<p>and diagrams to recognize, represent, explain, and solve proportional relationships. Mathematics should be represented in as many ways as possible in this unit by using graphs, tables, pictures, symbols, and words.</p> <p>Students will develop a deep understanding of the characteristics of a proportional relationship, including the exploration of similarity informally when learning about scale drawings of geometric figures and explaining why the slope of a non-vertical line is constant. Further, students should demonstrate a conceptual understanding of the relationship between the slope of a line and unit rate. Mathematics should be represented in multiple ways, including graphs, tables, pictures, symbols, and words.</p>	<p>and use proportional reasoning to understand the relationship between the diameter and circumference, deriving formulas for circumference and area to solve problems. Students will solve problems involving the surface area and volume of right prisms and cylinders and explore two-dimensional cross-sections of three-dimensional solids.</p>	<p>models to find the likelihood of simple events and make predictions using simulations' information. Students will compare theoretical and experimental probabilities of events and explain discrepancies.</p>
<p style="text-align: center;">3-4 weeks GMAS % = 0.48</p>	<p style="text-align: center;">4-5 weeks GMAS % = 0.16</p>	<p style="text-align: center;">4-5 weeks GMAS % = 0.16</p>
<p>7.PAR.4 Recognize proportional relationships in relevant, mathematical problems; represent, solve, and explain these relationships with tables, graphs, and equations.</p> <ul style="list-style-type: none"> • 7.PAR.4.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units presented in realistic problems. • 7.PAR.4.2 Determine the unit rate (constant of proportionality) in tables, graphs ($1, r$), equations, diagrams, and verbal descriptions of proportional relationships to solve realistic problems. • 7.PAR.4.3 Determine whether two quantities presented in authentic problems are in a proportional relationship. 	<p>7.GSR.5 Solve practical problems involving angle measurement, circles, area of circles, surface area of prisms and cylinders, and volume of cylinders and prisms composed of cubes and right prisms.</p> <ul style="list-style-type: none"> • 7.GSR.5.1 Measure angles in whole non-standard units. • 7.GSR.5.2 Measure angles in whole number degrees using a protractor. • 7.GSR.5.3 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve equations for an unknown angle in a figure • 7.GSR.5.4 Explore and describe the relationship between pi, radius, diameter, circumference, and area of a circle to derive the formulas for the circumference and area of a circle. 	<p>7.PR.6 Using mathematical reasoning, investigate chance processes and develop, evaluate, and use probability models to find probabilities of simple events presented in authentic situations.</p> <ul style="list-style-type: none"> • 7.PR.6.1 Represent the probability of a chance event as a number between 0 and 1 that expresses the likelihood of the event occurring. Describe that a probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. • 7.PR.6.2 Approximate the probability of a chance event by collecting data on an event and observing its long-run relative frequency will approach the theoretical probability.

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<ul style="list-style-type: none"> • 7.PAR.4.4 Identify, represent, and use proportional relationships. • 7.PAR.4.5 Use context to explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate. • 7.PAR.4.6 Solve everyday problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. • 7.PAR.4.7 Use similar triangles to explain why the slope, m, is the same between any two distinct points on a non-vertical line in the coordinate plane. • 7.PAR.4.8 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. 	<ul style="list-style-type: none"> • 7.GSR.5.5 Given the formula for the area and circumference of a circle, solve problems that exist in everyday life. • 7.GSR.5.6 Solve realistic problems involving surface area of right prisms and cylinders. • 7.GSR.5.7 Describe the two-dimensional figures (cross sections) that result from slicing three-dimensional figures, as in the plane sections of right rectangular prisms, right rectangular pyramids, cones, cylinders, and spheres. • 7.GSR.5.8 Explore volume as a measurable attribute of cylinders and right prisms. Find the volume of these geometric figures using concrete problems 	<ul style="list-style-type: none"> • 7.PR.6.3 Develop a probability model and use it to find probabilities of simple events. Compare experimental and theoretical probabilities of events. If the probabilities are not close, explain possible sources of the discrepancy. • 7.PR.6.4 Develop a uniform probability model by assigning equal probability to all outcomes and use the model to determine probabilities of events. • 7.PR.6.5 Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. • 7.PR.6.6 Use appropriate graphical displays and numerical summaries from data distributions with categorical or quantitative (numerical) variables as probability models to draw informal inferences about two samples or populations.
<p>Learning Targets:</p> <ul style="list-style-type: none"> • Understand ratios of rational numbers and use ratio tables to represent equivalent ratios. • Understand rates involving fractions and use unit rates to solve problems. • Determine whether two quantities are in a proportional relationship. • Use proportions to solve ratio problems. 	<p>Learning Targets:</p> <ul style="list-style-type: none"> • Find the circumference of a circle. • Find the area of a circle. • Find perimeters and areas of composite figures. • Measure and draw angles. • Use facts about angle relationships to find unknown angle measures. • Find the surface area of a prism. • Find the surface area of a cylinder. • Find the volume of a prism. • Find the volume of a cylinder. 	<p>Learning Targets:</p> <ul style="list-style-type: none"> • Understand how to use random samples to make conclusions about a population. • Understand variability in samples of a population. • Compare populations using measures of center and variation. • Use random samples to compare populations. • Understand how the probability of an event indicates its likelihood.

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<ul style="list-style-type: none"> • Represent proportional relationships using graphs and equations. • Solve problems involving scale drawings. • Use the percent proportion to find missing quantities. • Use the percent equation to find missing quantities. • Find percentages of change in quantities. • Solve percent problems involving discounts and markups. • Understand and apply the simple interest formula. <p>Success Criteria:</p> <ul style="list-style-type: none"> • Write and interpret ratios involving rational numbers. • Use various operations to create tables of equivalent ratios. • Use ratio tables to solve ratio problems. • Find unit rates for rates involving fractions. • Use unit rates to solve rate problems. • Determine whether ratios form a proportion. • Explain how to determine whether quantities are proportional. • Distinguish between proportional and nonproportional situations. 	<ul style="list-style-type: none"> • Describe the cross sections of a solid. <p>Success Criteria:</p> <ul style="list-style-type: none"> • Explain the relationship between the diameter and circumference of a circle. • Use a formula to find the circumference of a circle. • Estimate the area of a circle. • Use a formula to find the area of a circle. • Use a grid to estimate perimeters and areas. • Identify the shapes that make up a composite figure. • Find the perimeters and areas of shapes that make up composite figures. • Measure angles using non-standard and standard units. • Draw and measure angles using a protractor. • Construct a triangle using angle measures. • Identify adjacent, complementary, supplementary, and vertical angles. • Use equations to find unknown angle measures. • Find unknown angle measures in real-life situations. • Use a formula to find the surface area of a prism. • Find the lateral surface area of a prism. • Use a formula to find the surface area of a cylinder. • Find the lateral surface area of a 	<ul style="list-style-type: none"> • Develop probability models using experimental and theoretical probability. • Use probability and measures of central tendency to compare data from two samples or populations. <p>Success Criteria:</p> <ul style="list-style-type: none"> • Explain why a sample is biased or unbiased. • Explain why conclusions made from a biased sample may not be valid. • Use an unbiased sample to make a conclusion about a population. • Use multiple random samples to make conclusions about a population. • Use multiple random samples to examine variation in estimates. • Find the measures of center and variation of a data set. • Describe the visual overlap of two data distributions numerically. • Determine whether there is a significant difference in the measures of center of two data sets. • Compare random samples using measures of center and variation. • Recognize whether random samples are likely to be representative of a population. • Compare populations using multiple random samples. • Identify possible outcomes of an
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- Solve proportions using various methods.
- Find a missing value that makes two ratios equivalent.
- Use proportions to represent and solve real-life problems.
- Determine whether quantities are proportional using a graph.
- Find the unit rate of a proportional relationship using a graph.
- Create equations to represent proportional relationships.
- Find an actual distance in a scale drawing.
- Explain the meaning of scale and scale factor.
- Use a scale drawing to find the actual lengths and areas of real-life objects.
- Write proportions to represent percent problems.
- Solve a proportion to find a percent, a part, or a whole.
- Write equations to represent percent problems.
- Use the percent equation to find a percent, a part, or a whole.
- Explain the meaning of percent of change.
- Find the percent of increase or decrease in a quantity.
- Find the percent error of a quantity.
- Use percent models to solve problems involving discounts and markups.
- Write and solve equations to solve problems involving discounts and markups.

cylinder.

- Use a formula to find the volume of a prism.
- Use the formula for the volume of a prism to find a missing dimension.
- Use a formula to find the volume of a cylinder.
- Use the formula for the volume of a cylinder to find a missing dimension.
- Explain the meaning of a cross section.
- Describe cross sections of prisms and pyramids.
- Describe cross sections of cylinders and cones.

experiment.

- Use probability and relative frequency to describe the likelihood of an event.
- Use relative frequency to make predictions.
- Explain the meanings of experimental probability and theoretical probability.
- Find experimental and theoretical probabilities.
- Use probability to make predictions.
- Tell whether data is qualitative or quantitative.
- Find a probability using a data display.
- Compare data from two samples or populations.

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<ul style="list-style-type: none">• Explain the meaning of simple interest.• Use the simple interest formula to solve problems.		
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