

SAU 21 Math Competencies/Standards K-8

	<u>Competency Statement</u>	<u>Power Standards</u>
Math (K)	Foundational Math Skills Students will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols and expressions for a variety of purposes, including variables.	1. Sequence: Knows number names and the count sequence. 2. Numbers: Identifies and writes numbers. 3. Counting: Counts to tell the number of objects.
	Numbers and Number Systems Students will demonstrate an understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers, fractions, and decimals.	1. Comparing: Compares numbers. 2. Place Value: Works with numbers 11-19 to gain foundations for place value.
	Reasoning and Computational Strategies Students will apply additive, multiplicative, and fractional reasoning using multiple strategies (algorithms, models, manipulatives) to solve authentic applied problems.	1. Add & Subtract: Understands addition and subtraction. 2. Fluency: Fluently adds and subtracts within 5.
	Measurement & Data Students will use measurement tools, units and attributes to describe and compare objects and will gather, represent, and interpret data.	1. Attributes: Describes and compares measurable attributes of shapes. 2. Classify: Classifies objects and counts the number of objects in each category.
	Geometry Students will reason with two dimensional shapes and complex figures to solve authentic applied problems.	1. Shapes: Identifies and describes shapes. 2. Reasoning: Analyzes, compares, creates, and composes shapes.
Math (1)	Symbolic Expression Students will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols and expressions for a variety of purposes, including variables.	1. Equations: Works with addition and subtraction equations. 2. Problem-Solving: Represents and solves problems involving addition and subtraction..
	Numbers and Number Systems	1. Sequence: Extends the counting sequence.

	Students will demonstrate an understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers, fractions, and decimals.	2. Place Value: Understands place value.
	Reasoning and Computational Strategies Students will apply additive, multiplicative, and fractional reasoning using multiple strategies (algorithms, models, manipulatives) to solve authentic applied problems.	1. Add & Subtract: Adds and subtracts within 20 2. Reasoning: Uses place value understanding to add and subtract. 3. Properties: Understands and applies properties of operations and the relationship between addition and subtraction.
	Measurement & Data Students will use measurement tools, units and attributes to describe and compare objects and will gather, represent, and interpret data.	1. Length: Measures lengths indirectly and with non-standard length units. 2. Time: Tells and writes time. 3. Data: Represents and interprets data.
	Geometry Students will reason with two dimensional shapes and complex figures to solve authentic applied problems.	1. Shapes: Reasons with shapes and their attributes. 2. Equal Parts: Understands equal parts of shapes.
Math (2)	Symbolic Expression Students will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols and expressions for a variety of purposes, including variables.	1. Problem-Solving: Represents and solves problems involving addition and subtraction.
	Numbers and Number Systems Students will demonstrate an understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers, fractions, and decimals.	1. Place Value: Understands place value.
	Reasoning and Computational Strategies Students will apply additive, multiplicative, and fractional reasoning using multiple strategies (algorithms, models, manipulatives) to solve authentic applied problems.	1. Reasoning: Uses place value understanding and properties of operations to add and subtract.

		<ol style="list-style-type: none"> Fluency: Fluently adds and subtracts within 20 using mental strategies. Grouping: Works with equal groups of objects to gain foundations for multiplication.
	<p>Measurement & Data Students will use measurement tools, units and attributes to describe and compare objects and will gather, represent, and interpret data.</p>	<ol style="list-style-type: none"> Data: Represents and interprets data. Length: Measures and estimates lengths in standard units. Connection: Relates addition and subtraction to length. Time & Money: Works with time and money.
	<p>Geometry Students will reason with two dimensional shapes and complex figures to solve authentic applied problems.</p>	<ol style="list-style-type: none"> Shapes: Recognizes and draws shapes having specified attributes. Equal Parts: Understands fractional parts of shapes.
Math (3)	<p>Symbolic Expression Students will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols and expressions for a variety of purposes, including variables</p>	<ol style="list-style-type: none"> Expressions: Represents problems involving multiplication and division. Operations: Solves problems involving the four operations.
	<p>Numbers and Number Systems Students will demonstrate an understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers, fractions, and decimals.</p>	<ol style="list-style-type: none"> Fractions: Develops understanding of fractions as numbers. Equivalence: Extends understanding of fraction equivalence and ordering.
	<p>Reasoning and Computational Strategies Students will apply additive, multiplicative, and fractional reasoning using multiple strategies (algorithms, models, manipulatives) to solve authentic applied problems.</p>	<ol style="list-style-type: none"> Multi-Digit: Uses place value understanding and properties of operations to perform multi-digit arithmetic. Problem-Solving: Solves problems involving multiplication and division. Properties: Understands properties of multiplication and the relationship between multiplication and division. Multiply & Divide: Multiplies and divides within 100.
	<p>Algebraic Functions Patterns, And Relations Students will make use of structure to represent, analyze, and</p>	<ol style="list-style-type: none"> Patterns: Explains patterns in arithmetic.

	<p>generalize change or patterns in various contexts using models and justification.</p>	
	<p>Geometry & Measurement Students will use measurement and attributes of two-dimensional shapes and complex figures to describe, compare, and solve authentic applied problems.</p>	<ol style="list-style-type: none"> 1. Measurement: Solves problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. 2. Area: Understands concepts of area and relates area to multiplication and to addition. 3. Perimeter: Recognizes perimeter as an attribute of plane figures and distinguishes between linear and area measures. 4. Shapes: Reasons with shapes and their attributes.
	<p>Data Students will gather, represent, and interpret data related to a particular/single context, including authentic applications.</p>	<ol style="list-style-type: none"> 1. Bar Graphs: Creates and uses scaled pictures and bar graphs. 2. Line Plots: Creates and reasons with line plots.
Math (4)	<p>Symbolic Expression Students will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols and expressions for a variety of purposes, including variables</p>	<ol style="list-style-type: none"> 1. Expressions: Uses the four operations with whole numbers to solve problems.
	<p>Numbers and Number Systems Students will demonstrate an understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers, fractions, and decimals.</p>	<ol style="list-style-type: none"> 1. Factors & Multiples: Gains familiarity with factors and multiples. 2. Place Value: Generalizes place value understanding for multi-digit whole numbers. 3. Equivalence: Understands decimal notation for fractions, and compares decimal fractions.
	<p>Reasoning and Computational Strategies Students will apply additive, multiplicative, and fractional reasoning using multiple strategies (algorithms, models, manipulatives) to solve authentic applied problems.</p>	<ol style="list-style-type: none"> 1. Fluency: Fluently adds and subtracts multi-digit whole numbers using the standard algorithm. 2. Reasoning A/S: Uses place value understanding and properties of operations to perform addition and subtraction.

		<ol style="list-style-type: none"> 3. Reasoning M/D: Uses place value understanding and properties of operations to perform multiplication and division. 4. Fractions: Builds fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
	<p>Algebraic Functions Patterns, And Relations Students will make use of structure to represent, analyze, and generalize change or patterns in various contexts using models and justification.</p>	<ol style="list-style-type: none"> 1. Patterns: Generates and analyzes patterns.
	<p>Geometry & Measurement Students will use measurement and attributes of two-dimensional shapes and complex figures to describe, compare, and solve authentic applied problems.</p>	<ol style="list-style-type: none"> 1. Measurement: Solves problems involving measurement and conversion of measurements from a larger unit to a smaller unit. 2. Angles: Understands concepts of angle and measure angles. 3. Classification: Draws and identifies lines and angles, and classifies shapes by properties of their lines and angles.
	<p>Data Students will gather, represent, and interpret data related to a particular/single context, including authentic applications.</p>	<ol style="list-style-type: none"> 1. Line Plots: Creates and analyzes line plots.
Math (5)	<p>Expressions and Equations Students will reason abstractly and manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value.</p>	<ol style="list-style-type: none"> 1. Numerical expressions: Writes and interprets numerical expressions.
	<p>Numbers and Number Systems Students will expand their understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using rational numbers.</p>	<ol style="list-style-type: none"> 1. Place Value: Understands the place value system. 2. Equivalent Fractions: Uses equivalent fractions as a strategy to add and subtract fractions.

	<p>Reasoning and Computational Strategies Students will expand the use of computational strategies, algorithms, and proportional reasoning to rational numbers.</p>	<ol style="list-style-type: none"> 1. Operations: Performs operations with multi-digit whole numbers and with decimals to hundredths. 2. Fractions: Applies and extends previous understandings of multiplication and division to multiply and divide fractions.
	<p>Algebraic Functions, Patterns & Relations Students will make use of structure to describe and compare situations that involve change or patterns and use the information to make conjectures and justify conclusions/solutions.</p>	<ol style="list-style-type: none"> 1. Relationships: Analyzes patterns and relationships.
	<p>Geometry & Measurement Students will solve problems involving reasoning and precision using properties of 2- and 3- dimensional shapes to analyze, represent, and model geometric relationships in authentic applied contexts.</p>	<ol style="list-style-type: none"> 1. Conversions: Converts like measurement units within a given measurement system. 2. Volume: Applies understanding of volume and relates volume to multiplication and addition. 3. Graphing: Graphs points on the coordinate plane to solve real-world and mathematical problems. 4. Classification: Classifies two-dimensional figures into categories based on properties.
	<p>Probability & Statistics Students will design investigations and gather data involving populations (data sets).</p>	<ol style="list-style-type: none"> 1. Data: Represents and interprets data.
Math (6)	<p>Expressions and Equations Students will reason abstractly and manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value.</p>	<ol style="list-style-type: none"> 1. Expressions - Applies and extends previous understandings of arithmetic to algebraic expressions.
	<p>Numbers and Number Systems Students will expand their understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using rational numbers.</p>	<ol style="list-style-type: none"> 1. Rational Numbers: Applies and extends previous understandings of numbers to the system of rational numbers.

	<p>Reasoning and Computational Strategies Students will expand the use of computational strategies, algorithms, and proportional reasoning to rational numbers.</p>	<ol style="list-style-type: none"> 1. Dividing Fractions: Applies and extends previous understandings of multiplication and division to divide fractions by fractions. 2. Factors and Multiples: Computes fluently with multi-digit numbers and finds common factors and multiples.
	<p>Algebraic Functions, Patterns & Relations Students will make use of structure to describe and compare situations that involve change or patterns and use the information to make conjectures and justify conclusions/solutions.</p>	<ol style="list-style-type: none"> 1. Ratios: Understands ratio concepts and uses ratio reasoning to solve problems.
	<p>Geometry Students will solve problems involving reasoning and precision using properties of 2- and 3- dimensional shapes to analyze, represent, and model geometric relationships in authentic applied contexts.</p>	<ol style="list-style-type: none"> 1. Area and Volume: Solves real-world and mathematical problems involving area, surface area, and volume.
	<p>Probability & Statistics Students will design investigations and gather data sets.</p>	<ol style="list-style-type: none"> 1. Statistics: Develops understanding of statistical variability. 2. Distribution: Summarizes and describes distribution.
Math (7)	<p>Expressions and Equations Students will reason abstractly and manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value.</p>	<ol style="list-style-type: none"> 1. Expressions: Uses properties of operations to generate equivalent expressions. 2. Solving: Solves real-life and mathematical problems using numerical and algebraic expressions and equations.
	<p>Numbers and Number Systems Students will expand their understanding of number systems thinking flexibly and attending to precision and reasonableness when solving problems using rational and irrational numbers.</p>	<ol style="list-style-type: none"> 1. Representations: Estimates and compares fractions, decimals, and percents.
	<p>Reasoning and Computational Strategies Students will expand the use of computational strategies, algorithms, and proportional reasoning to rational and irrational numbers.</p>	<ol style="list-style-type: none"> 1. Operations: Reasons with positive and negative numbers and the properties of operations to add, subtract, multiply and divide rational numbers. 2. Unit Rates: Identifies, generates, and computes unit rates associated with ratios of fractions.

	<p>Algebraic Functions, Patterns & Relations Students will make use of structure to describe and compare situations that involve proportionality, change, or patterns and use the information to make conjectures and justify conclusions/solutions.</p>	<ol style="list-style-type: none"> 1. Proportional Relationships: Estimates and compares ratios and proportions. 2. Proportionality: Uses proportional relationships to solve problems.
	<p>Geometry Students will solve problems involving reasoning using properties of 2- and 3- dimensional shapes to analyze, represent, and model geometric relationships in pure/theoretical and authentic applied contexts.</p>	<ol style="list-style-type: none"> 1. Geometric Figures: Constructs and scales 2-dimensional figures. 2. Circles: Finds area and circumference of circles. 3. Angles: Applies angle properties. 4. Area & Volume: Calculates area, surface area, volume of shapes.
	<p>Probability & Statistics Students will design investigations, conduct probability experiments, and analyze data sets involving populations.</p>	<ol style="list-style-type: none"> 1. Statistics: Interprets and analyzes data. 2. Probability: Investigates chance processes and develops, uses, and evaluates probability models.
Math (8)	<p>Expressions and Equations Students will reason abstractly and manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value.</p>	<ol style="list-style-type: none"> 1. Radicals: Uses square and cubed roots as solutions. 2. Scientific Notation: Uses products of integer powers of ten to represent numbers. 3. Solving: Analyzes and solves linear equations and systems of linear equations.
	<p>Numbers and Number Systems Students will expand their understanding of number systems thinking flexibly and attending to precision and reasonableness when solving problems using rational and irrational numbers.</p>	<ol style="list-style-type: none"> 1. Irrational Numbers: Determines if a number is rational or irrational and approximate values.
	<p>Reasoning and Computational Strategies Students will expand the use of computational strategies, algorithms, and proportional reasoning to rational and irrational numbers.</p>	<ol style="list-style-type: none"> 1. Foundational Skills: Reasons with positive and negative numbers and the properties of operations to add, subtract, multiply and divide rational numbers. 2. Exponents: Applies properties and performs operations with radicals and integer exponents.
	<p>Algebraic Functions, Patterns & Relations Students will make use of structure to describe and compare situations that involve proportionality, change, or patterns</p>	<ol style="list-style-type: none"> 1. Functions: Defines, evaluates, and compares functions.

	<p>and use the information to make conjectures and justify conclusions/solutions.</p>	<ol style="list-style-type: none"> 2. Linear Functions: Analyzes linear equations in slope-intercept form. 3. Modeling: Uses functions to model relationships between quantities.
	<p>Geometry Students will solve problems involving reasoning using properties of 2- and 3- dimensional shapes to analyze, represent, and model geometric relationships in pure/theoretical and authentic applied contexts.</p>	<ol style="list-style-type: none"> 1. Transformations: Describes, constructs and applies transformations. 2. Pythagorean Theorem: Understands and apply the Pythagorean Theorem. 3. Volume: Solves problems involving the volume of cones, cylinders, and spheres. 4. Angles: Determines unknown values by applying angle properties.
	<p>Statistics Students will design investigans and conduct probability experiments involving populations.</p>	<ol style="list-style-type: none"> 1. Statistics: Analyzes patterns of bivariate data.