Mathematics K-12

Mathematics Core Competencies

Symbolic Expression	Numbers and Number Systems	Reasoning and Computational Strategies	Metacognitive Skills and Communication	Measurement	Algebraic Functions Patterns, And Relations	Geometry	Data Analysis, Probability, And Statistics

Grades 9-12

Algebra Strand				Geometry Strand			Calculus Strand		
Expressions	**Equations and Inequalities**	**Functions and Relations**	**Data Analysis, Probability, and Statistics**	**Congruence and Similarity**	**Polygons and Circles**	**Solids**	**Limits and Continuity**	**Derivatives**	**Integrals**
Students will demonstrate the ability to effectively use algebraic properties in an effort to manipulate and obtain equivalent expressions, see structure in expressions, and perform arithmetic with polynomial and rational expressions.	Students will demonstrate the ability to setup and solve equations, inequalities, and systems of equations both algebraically and graphically in an effort to solve real world problems and explain reasoning.	Students will demonstrate the ability to interpret, analyze, and build a variety of algebraic, transcendental, and trigonometric functions and models in an effort to represent real world data.	Students will demonstrate the ability to interpret categorical and quantitative data, make inferences and conclusions, apply the rules of probability, and use probability to make decisions.	Students will demonstrate the ability to experiment with transformations in a plane, understand congruence and similarity, and prove geometric theorems and theorems involving similarity.	Students will demonstrate the ability to understand and apply theorems about circles, find arc lengths, and find areas of sectors and differentiate between the different types of polygons.	Students will demonstrate the ability differentiate between the different types of solid figures, derive and use the formulas for three dimensional figures, and visualize the relationship between two and three dimensional figures.	Students will demonstrate the ability to intuitively understand the limit process, evaluate limits graphically, algebraically, and numerically, and define continuity at a point and on an interval.	Students will demonstrate the ability to understand the concept of the derivative geometrically, numerically, and algebraically, interpret it as the instantaneous rate of change, and apply the derivative in a variety of applications.	Students will demonstrate the ability to interpret the integral as a limit of Riemann sum, use a variety of anti-differentiation techniques, understand the Fundamental Theorem, and use integrals to solve problems including volumes of solids, average values, distance,

									differential equations, and exponential growth/decay.
Grades 6-8									
Symbolic Expression	**Numbers and Number Systems**	**Reasoning and Computational Strategies**	**Metacognitive Skills and Communication**	**Measurement**	**Algebraic Functions Patterns, And Relations**	**Geometry**	**Data Analysis, Probability, And Statistics**		
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	Students will expand their understanding of number systems thinking flexibly and attending to precision and reasonableness when solving problems using rational and irrational numbers.	Students will expand the use of computational strategies, algorithms, and proportional reasoning to rational and irrational numbers	Students will use reasoning and metacognitive skills through making conjectures, justifying, and effectively communicating mathematical solutions and arguments.	Students will strategically use tools and apply proportional reasoning and precision to solve measurement problems in pure/theoretical and authentic applied contexts.	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.	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.	Students will design investigations and conduct probability experiments involving populations.		
Grades K-5									
Symbolic Expression	**Numbers and Number Systems**	**Reasoning and Computational Strategies**	**Metacognitive Skills and Communication**	**Measurement**	**Algebraic Functions Patterns, And Relations**	**Geometry**	**Data Analysis, Probability, And Statistics**		
Students will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols and expressions for a variety of purposes, including variables.	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.	Students will apply additive, multiplicative, and fractional reasoning using multiple strategies (algorithms, models, manipulatives) to solve authentic applied problems.	Students will use reasoning and self-monitoring to analyze and justify one or more solution pathways.	Students will use measurement tools, units, and attributes to describe and compare objects, situations, or events, and to solve authentic applied measurement problems.	Students will make use of structure to represent, analyze, and generalize change or patterns in various contexts using models and justification.	Students will use attributes of two dimensional shapes and complex figures to solve authentic applied problems.	Students will gather, represent, and interpret data related to a particular/single context, including authentic applications.		