



Numbers and Operations

Standard	Kindergarten 0006	Grade 1 0106	Grade 2 0206	Grade 3 0306	Grade 4 0406	Grade 5 0506	Grade 6 0606	Grade 7 0706	Grade 8 0806	Algebra 1 3102	Geometry 3108	Algebra 2 3103
	<p><b>GLE 0006.2.1</b> Count objects in a set and use numbers, including written numerals to 25.</p> <p><b>GLE 0006.2.2</b> Create, represent and recognize a set with a given number of objects.</p> <p><b>GLE 0006.2.3</b> Recognize, compare and order sets of numerals by using both cardinal and ordinal meanings.</p> <p><b>GLE 0006.2.4</b> Understand addition as “putting together” and subtraction as “breaking apart.”</p> <p><b>GLE 0006.2.5</b> Model the numbers 1 through 10 as sums or differences of different sets of whole numbers (composing and decomposing numbers).</p>	<p><b>GLE 0106.2.1</b> Understand and use number notation and place value to 100.</p> <p><b>GLE 0106.2.2</b> Compare and order whole numbers to 100.</p> <p><b>GLE 0106.2.3</b> Develop strategies for learning basic addition facts and related subtraction facts.</p> <p><b>GLE 0106.2.4</b> Use multiple representations (including groups of ten) to model two-digit addition and subtraction.</p>	<p><b>GLE 0206.2.1</b> Understand and use place value concepts to 1000.</p> <p><b>GLE 0206.2.2</b> Understand and use the base-ten numeration system.</p> <p><b>GLE 0206.2.3</b> Use efficient and accurate strategies to develop fluency with multi-digit addition and subtraction.</p> <p><b>GLE 0206.2.4</b> Develop an initial understanding of multiplication.</p>	<p><b>GLE 0306.2.1</b> Understand the place value of whole numbers to ten-thousands place including expanded notation for all arithmetic operations.</p> <p><b>GLE 0306.2.2</b> Develop understanding of multiplication and related division facts through multiple strategies and representations.</p> <p><b>GLE 0306.2.3</b> Relate multiplication and division as inverse operations.</p> <p><b>GLE 0306.2.4</b> Solve multiplication and division problems using various representations.</p> <p><b>GLE 0306.2.5</b> Understand the meaning and uses of fractions.</p> <p><b>GLE 0306.2.6</b> Use various strategies and models to compare and order fractions and identify equivalent fractions.</p> <p><b>GLE 0306.2.7</b> Add and subtract fractions with like denominators using various models.</p>	<p><b>GLE 0406.2.1</b> Understand place value of numbers from hundredths to the hundred-thousands place.</p> <p><b>GLE 0406.2.2</b> Develop fluency with multiplication and single-digit division.</p> <p><b>GLE 0406.2.3</b> Identify prime and composite numbers.</p> <p><b>GLE 0406.2.4</b> Understand and use the connections between fractions and decimals.</p> <p><b>GLE 0406.2.5</b> Add and subtract fractions with like and unlike denominators.</p> <p><b>GLE 0406.2.6</b> Solve problems involving whole numbers, fractions, and/or decimals using all four arithmetic operations.</p>	<p><b>GLE 0506.2.1</b> Extend the understanding of place value through millions and millionths in various contexts and representations.</p> <p><b>GLE 0506.2.2</b> Write natural numbers (to 50) as a product of prime factors and understand that this is unique (apart from order).</p> <p><b>GLE 0506.2.3</b> Develop fluency with division of whole numbers. Understand the relationship of divisor, dividend, and quotient in terms of multiplication and division.</p> <p><b>GLE 0506.2.4</b> Develop fluency with addition and subtraction of proper and improper fractions and mixed numbers; explain and model the algorithm.</p> <p><b>GLE 0506.2.5</b> Develop fluency in solving multi-step problems using whole numbers, fractions, mixed numbers, and decimals.</p>	<p><b>GLE 0606.2.1</b> Understand and explain the procedures for multiplication and division of fractions, mixed numbers, and decimals.</p> <p><b>GLE 0606.2.2</b> Solve multi-step mathematical, contextual and verbal problems using fractions, mixed numbers, and decimals.</p> <p><b>GLE 0606.2.3</b> Understand and use ratios, rates and percents.</p> <p><b>GLE 0606.2.4</b> Understand and convert between fraction, decimal, and percent forms of rational numbers.</p> <p><b>GLE 0606.2.5</b> Develop meaning for integers; represent and compare quantities with integers.</p>	<p><b>GLE 0706.2.1</b> Extend understandings of addition, subtraction, multiplication and division to integers.</p> <p><b>GLE 0706.2.2</b> Understand and work with the properties of and operations on the system of rational numbers.</p> <p><b>GLE 0706.2.3</b> Develop an understanding of and apply proportionality.</p> <p><b>GLE 0706.2.4</b> Use ratios, rates and percents to solve single- and multi-step problems in various contexts.</p> <p><b>GLE 0706.2.5</b> Understand and work with squares, cubes, square roots and cube roots.</p> <p><b>GLE 0706.2.6</b> Introduce the concept of negative exponents.</p> <p><b>GLE 0706.2.7</b> Understand and use scientific notation.</p>	<p><b>GLE 0806.2.1</b> Extend understanding of the real number system to include irrational numbers.</p> <p><b>GLE 0806.2.2</b> Solve problems involving exponents and scientific notation using technology appropriately.</p> <p><b>GLE 0806.2.3</b> Solve real-world problems using rational and irrational numbers.</p> <p><b>GLE 0806.2.4</b> Understand and use the laws of exponents.</p>	<p><b>CLE 3102.2.1</b> Understand computational results and operations involving real numbers in multiple representations.</p> <p><b>CLE 3102.2.2</b> Understand properties of and relationships between subsets and elements of the real number system.</p>	<p><b>CLE3108.2.1</b> Establish the relationships between the real numbers and geometry; explore the importance of irrational numbers to geometry.</p> <p><b>CLE3108.2.2</b> Explore vectors as a numeric system, focusing on graphic representations and the properties of the operation.</p> <p><b>CLE3108.2.3</b> Establish an ability to estimate, select appropriate units, evaluate accuracy of calculations and approximate error in measurement in geometric settings.</p>	<p><b>CLE 3103.2.1</b> Understand the hierarchy of the complex number system and relationships between the elements, properties and operations.</p> <p><b>CLE 3103.2.2</b> Connect numeric, analytic, graphical and verbal representations of both real and complex numbers.</p> <p><b>CLE 3103.2.3</b> Use appropriate technology (including graphing calculators and computer spreadsheets) to solve problems, recognize patterns and collect and analyze data.</p> <p><b>CLE 3103.2.4</b> Understand the capabilities and limitations of technology when performing operations, graphing, and solving equations involving complex numbers.</p>

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<b>Algebra</b>	<p><b>GLE 0006.3.1</b> Identify, duplicate, and extend simple number patterns and sequential and growing patterns.</p> <p><b>GLE 0006.3.2</b> Recognize attributes (such as color, shape, size) and patterns (such as repeated pairs, bilateral symmetry).</p> <p><b>GLE 0006.3.3</b> Describe qualitative change.</p>	<p><b>GLE 0106.3.1</b> Identify, describe, and extend simple number patterns to develop strategies for adding and subtracting whole numbers.</p> <p><b>GLE 0106.3.2</b> Understand that addition and subtraction are inverse operations.</p> <p><b>GLE 0106.3.3</b> Extend the strategies for basic facts to include other properties of number and operations.</p>	<p><b>GLE 0206.3.1</b> Develop pattern recognition.</p> <p><b>GLE 0206.3.2</b> Extend knowledge of the properties of numbers and operations to multiplication.</p> <p><b>GLE 0206.3.3</b> Solve simple arithmetic problems using various methods.</p> <p><b>GLE 0206.3.4</b> Describe quantitative change.</p>	<p><b>GLE 0306.3.1</b> Develop meaning for and apply the commutative, associative, and distributive properties using various representations.</p> <p><b>GLE 0306.3.2</b> Develop understanding that a letter or a symbol can represent an unknown quantity in a simple mathematical expression/equation.</p> <p><b>GLE 0306.3.3</b> Describe and analyze patterns and relationships in contexts.</p> <p><b>GLE 0306.3.4</b> Create and represent patterns using words, tables, graphs, and symbols.</p>	<p><b>GLE 0406.3.1</b> Extend understanding of a variable to equations involving whole numbers, fractions, decimals, and/or mixed numbers.</p> <p><b>GLE 0406.3.2</b> Use mathematical language and modeling to develop descriptions, rules and extensions of patterns.</p> <p><b>GLE 0406.3.3</b> Translate between different forms of representations of whole number relationships.</p>	<p><b>GLE 0506.3.1</b> Understand and use order of operations.</p> <p><b>GLE 0506.3.2</b> Develop and apply the concept of variable.</p> <p><b>GLE 0506.3.3</b> Understand and apply the substitution property.</p> <p><b>GLE 0506.3.4</b> Solve single-step linear equations and inequalities.</p>	<p><b>GLE 0606.3.1</b> Write and solve two-step equations and inequalities.</p> <p><b>GLE 0606.3.2</b> Interpret and represent algebraic relationships with variables in expressions, simple equations and inequalities.</p> <p><b>GLE 0606.3.3</b> Extend order of operations to include grouping symbols and exponents.</p> <p><b>GLE 0606.3.4</b> Use expressions, equations and formulas to solve problems.</p> <p><b>GLE 0606.3.5</b> Use multiple representations including symbolic algebra to model and/or solve contextual problems that involve linear relationships.</p> <p><b>GLE 0606.3.6</b> Understand and use the Cartesian coordinate system.</p>	<p><b>GLE 0706.3.1</b> Recognize and generate equivalent forms for simple algebraic expressions.</p> <p><b>GLE 0706.3.2</b> Understand and compare various representations of relations and functions.</p> <p><b>GLE 0706.3.3</b> Understand the concept of function as a rule that assigns to a given input one and only one number (the output).</p> <p><b>GLE 0706.3.4</b> Use function notation where <math>f(x)</math> represents the output that the function <math>f</math> assigns to the input <math>x</math>.</p> <p><b>GLE 0706.3.5</b> Understand and graph proportional relationships.</p> <p><b>GLE 0706.3.6</b> Conceptualize the meanings of slope using various interpretations, representations, and contexts.</p> <p><b>GLE 0706.3.7</b> Use mathematical models involving linear equations to analyze real-world phenomena.</p> <p><b>GLE 0706.3.8</b> Use a variety of strategies to efficiently solve linear equations and inequalities.</p>	<p><b>GLE 0806.3.1</b> Recognize and generate equivalent forms for algebraic expressions.</p> <p><b>GLE 0806.3.2</b> Represent, analyze, and solve problems involving linear equations and inequalities in one and two variables.</p> <p><b>GLE 0806.3.3</b> Solve systems of linear equations in two variables.</p> <p><b>GLE 0806.3.4</b> Translate among verbal, tabular, graphical and algebraic representations of linear functions.</p> <p><b>GLE 0806.3.5</b> Use slope to analyze situations and solve problems.</p> <p><b>GLE 0806.3.6</b> Compare and contrast linear and nonlinear functions.</p>	<p><b>CLE 3102.3.1</b> Use algebraic thinking to analyze and generalize patterns.</p> <p><b>CLE 3102.3.2</b> Understand and apply properties in order to perform operations with, evaluate, simplify, and factor expressions and polynomials.</p> <p><b>CLE 3102.3.3</b> Understand and apply operations with rational expressions and equations.</p> <p><b>CLE 3102.3.4</b> Solve problems involving linear equations and linear inequalities.</p> <p><b>CLE 3102.3.5</b> Manipulate formulas and solve literal equations.</p> <p><b>CLE 3102.3.6</b> Understand and use relations and functions in various representations to solve contextual problems.</p> <p><b>CLE 3102.3.7</b> Construct and solve systems of linear equations and inequalities in two variables by various methods.</p> <p><b>CLE 3102.3.8</b> Solve and understand solutions of quadratic equations with real roots.</p> <p><b>CLE 3102.3.9</b> Understand and use exponential functions to solve contextual problems.</p>	<p><b>CLE 3108.3.1</b> Use analytic geometry tools to explore geometric problems involving parallel and perpendicular lines, circles, and special points of polygons.</p> <p><b>CLE 3108.3.2</b> Explore the effect of transformations on geometric figures and shapes in the coordinate plane.</p>	<p><b>CLE 3103.3.1</b> Understand and apply properties of rational exponents and perform basic operations to simplify algebraic expressions.</p> <p><b>CLE 3103.3.2</b> Understand, analyze, transform and generalize mathematical patterns, relations and functions using properties and various representations.</p> <p><b>CLE 3103.3.3</b> Analyze and apply various methods to solve equations, absolute values, inequalities, and systems of equations over complex numbers.</p> <p><b>CLE 3103.3.4</b> Graph and compare equations and inequalities in two variables. Identify and understand the relationships between the algebraic and geometric properties of the graph.</p> <p><b>CLE 3103.3.5</b> Use mathematical models involving equations and systems of equations to represent, interpret and analyze quantitative relationships, change in various contexts, and other real-world phenomena.</p>

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<b>Geometry and Measurement</b>	<p><b>GLE 0006.4.1</b> Interpret and describe the physical world with geometric ideas and vocabulary.</p> <p><b>GLE 0006.4.2</b> Use positional terms to specify locations with simple relationships.</p> <p><b>GLE 0006.4.3</b> Compare and order measurable attributes of objects directly (by comparing them with each other) and indirectly (by comparing both with a third object).</p>	<p><b>GLE 0106.4.1</b> Recognize, describe, and draw geometric figures.</p> <p><b>GLE 0106.4.2</b> Compose and decompose geometric shapes.</p> <p><b>GLE 0106.4.3</b> Use non-standard units in linear measurement.</p>	<p><b>GLE 0206.4.1</b> Recognize, classify, and transform 2- and 3-dimensional geometric figures.</p> <p><b>GLE 0206.4.2</b> Understand the meaning and process of linear measurement.</p> <p><b>GLE 0206.4.3</b> Add, subtract, compare, compute and estimate linear measurements.</p> <p><b>GLE 0206.4.4</b> Compose and decompose polygons to make other polygons.</p>	<p><b>GLE 0306.4.1</b> Describe, compare, and analyze properties of polygons.</p> <p><b>GLE 0306.4.2</b> Understand and apply the concepts of congruence and symmetry.</p> <p><b>GLE 0306.4.3</b> Understand and use attributes of 2- and 3-dimensional figures to solve problems.</p> <p><b>GLE 0306.4.4</b> Use appropriate units, strategies and tools to solve problems involving perimeter.</p> <p><b>GLE 0306.4.5</b> Solve measurement problems involving fractional parts of linear units and capacity units.</p>	<p><b>GLE 0406.4.1</b> Understand and use the properties of lines, segments, angles, polygons, and circles.</p> <p><b>GLE 0406.4.2</b> Understand and use measures of length, area, capacity, and weight.</p> <p><b>GLE 0406.4.3</b> Solve problems that involve estimating and measuring length, area, capacity and weight.</p> <p><b>GLE 0406.4.4</b> Understand the representation of location and movement within the first quadrant of a coordinate system.</p>	<p><b>GLE 0506.4.1</b> Use basic formulas and visualization to find the area of geometric figures.</p> <p><b>GLE 0506.4.2</b> Describe polyhedral solids and analyze their properties, including volume and surface area.</p> <p><b>GLE 0506.4.3</b> Describe length/distance relationships using the first quadrant of the coordinate system.</p> <p><b>GLE 0506.4.4</b> Solve problems that require attention to both approximation and precision of measurement.</p>	<p><b>GLE 0606.4.1</b> Understand and use basic properties of triangles, quadrilaterals, and other polygons.</p> <p><b>GLE 0606.4.2</b> Use the concepts of translation, rotation, reflection, and symmetry to understand congruence in the plane.</p> <p><b>GLE 0606.4.3</b> Develop and use formulas to determine the circumference and area of circles, and the area of trapezoids, and develop strategies to find the area of composite shapes.</p> <p><b>GLE 0606.4.4</b> Develop and use formulas for surface area and volume of 3-dimensional figures.</p>	<p><b>GLE 0706.4.1</b> Understand the application of proportionality with similar triangles.</p> <p><b>GLE 0706.4.2</b> Apply proportionality to converting among different units of measurements to solve problems involving rates such as motion at a constant speed.</p> <p><b>GLE 0706.4.3</b> Understand and use scale factor to describe the relationships between length, area, and volume.</p> <p><b>GLE 0706.4.4</b> Understand and use ratios, derived quantities, and indirect measurements.</p>	<p><b>GLE 0806.4.1</b> Derive the Pythagorean theorem and understand its applications.</p> <p><b>GLE 0806.4.2</b> Understand the relationships among the angles formed by parallel lines cut by transversals.</p> <p><b>GLE 0806.4.3</b> Understand the necessary levels of accuracy and precision in measurement.</p> <p><b>GLE 0806.4.4</b> Understand both metric and customary units of measurement.</p> <p><b>GLE 0806.4.5</b> Use visualization to describe or identify intersections, cross-sections, and various views of geometric figures.</p>	<p><b>CLE 3102.4.1</b> Use algebraic reasoning in applications involving geometric formulas and contextual problems.</p> <p><b>CLE 3102.4.2</b> Apply appropriate units of measure and convert measures in problem solving situations.</p>	<p><b>CLE 3108.4.1</b> Develop the structures of geometry, such as lines, angles, planes, and planar figures, and explore their properties and relationships.</p> <p><b>CLE 3108.4.2</b> Describe the properties of regular polygons, including comparative classification of them and special points and segments.</p> <p><b>CLE 3108.4.3</b> Develop an understanding of the tools of logic and proof, including aspects of formal logic as well as construction of proofs.</p> <p><b>CLE 3108.4.4</b> Develop geometric intuition and visualization through performing geometric constructions with straightedge/compass and with technology.</p> <p><b>CLE 3108.4.5</b> Extend the study of planar figures to three-dimensions, including the classical solid figures, and develop analysis through cross-sections.</p> <p><b>CLE 3108.4.6</b> Generate formulas for perimeter, area, and volume, including their use, dimensional analysis, and applications.</p> <p><b>CLE 3108.4.7</b> Apply the major concepts of transformation geometry to analyzing geometric objects and symmetry.</p> <p><b>CLE 3108.4.8</b> Establish processes for determining congruence and similarity of figures, especially as related to scale factor, contextual applications, and transformations.</p> <p><b>CLE 3108.4.9</b> Develop the role of circles in geometry, including angle measurement, properties as a geometric figure, and aspects relating to the coordinate plane.</p> <p><b>CLE 3108.4.10</b> Develop the tools of right triangle trigonometry in the contextual applications, including the Pythagorean Theorem, Law of Sines and Law of Cosines</p>	<p><b>CLE 3103.4.1</b> Understand the trigonometric functions and their relationship to the unit circle.</p> <p><b>CLE 3103.4.2</b> Know and use the basic identities of sine, cosine, and tangent as well as their reciprocals.</p> <p><b>CLE 3103.4.3</b> Graph all six trigonometric functions and identify their key characteristics.</p> <p><b>CLE 3103.4.4</b> Know and use the Law of Sines to find missing sides and angles of a triangle, including the ambiguous case.</p> <p><b>CLE 3103.4.5</b> Use trigonometric concepts, properties and graphs to solve problems.</p>

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<b>Data Analysis, Statistics, and Probability</b>	<p><b>GLE 0006.5.1</b> Sort objects and use one or more attributes to solve problems.</p> <p><b>GLE 0006.5.2</b> Re-sort objects using new attributes.</p>	<p><b>GLE 0106.5.1</b> Use various representations to display and compare data.</p>	<p><b>GLE 0206.5.1</b> Use and understand various representations to depict and analyze data measurements.</p> <p><b>GLE 0206.5.2</b> Determine whether an event is likely or unlikely.</p>	<p><b>GLE 0306.5.1</b> Organize, display, and analyze data using various representations to solve problems.</p>	<p><b>GLE 0406.5.1</b> Collect, record, arrange, present, and interpret data using tables and various representations.</p> <p><b>GLE 0406.5.2</b> Use probability to describe chance events.</p>	<p><b>GLE 0506.5.1</b> Make, record, display and interpret data and graphs that include whole numbers, decimals, and fractions.</p> <p><b>GLE 0506.5.2</b> Describe the shape and important features of a set of data using the measures of central tendency.</p>	<p><b>GLE 0606.5.1</b> Understand the meaning of probability and how it is expressed.</p> <p><b>GLE 0606.5.2</b> Interpret representations of data from surveys and polls, and describe sample bias and how data representations can be misleading.</p>	<p><b>GLE 0706.5.1</b> Collect, organize, and analyze both single- and two-variable data.</p> <p><b>GLE 0706.5.2</b> Select, create, and use appropriate graphical representations of data.</p> <p><b>GLE 0706.5.3</b> Formulate questions and design studies to collect data about a characteristic shared by two populations, or different characteristics within one population.</p> <p><b>GLE 0706.5.4</b> Use descriptive statistics to summarize and compare data.</p> <p><b>GLE 0706.5.5</b> Understand and apply basic concepts of probability.</p>	<p><b>GLE 0806.5.1</b> Explore probabilities for compound, independent and/or dependent events.</p> <p><b>GLE 0806.5.2</b> Select, create, and use appropriate graphical representations of data (including scatterplots with lines of best fit) to make and test conjectures.</p> <p><b>GLE 0806.5.3</b> Evaluate the use of statistics in media reports.</p>	<p><b>CLE 3102.5.1</b> Describe and interpret quantitative information.</p> <p><b>CLE 3102.5.2</b> Use statistical thinking to draw conclusions and make predictions.</p> <p><b>CLE 3102.5.3</b> Understand basic counting procedures and concepts of probability.</p>	<p><b>CLE 3108.5.1</b> Analyze, interpret, employ and construct accurate statistical graphs.</p> <p><b>CLE 3108.5.2</b> Develop the basic principles of geometric probability.</p>	<p><b>CLE 3103.5.1</b> Describe, interpret, and apply quantitative data.</p> <p><b>CLE 3103.5.2</b> Evaluate and critique various ways of collecting data and using information based on data published in the media.</p> <p><b>CLE 3103.5.3</b> Use data and statistical thinking to draw inferences, make predictions, justify conclusions and identify and explain misleading uses of data.</p> <p><b>CLE 3103.5.4</b> Develop an understanding of probability concepts in order to make informed decisions.</p>