

## K-12 MATH Standards/Benchmarks/Grade Level Expectations (GLE)

Updated 9/27/07

### Standard 1: Understands and applies problem solving strategies.

#### Interval Benchmark 1: Uses a variety of strategies to solve problems

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus
a. Applies problem solving strategies	a. Applies problem solving strategies	a. Applies problem solving strategies	a. Applies problem solving strategies	a. Uses a variety of strategies to understand new mathematical content	a. Uses a variety of strategies to understand new mathematical content	a. Uses a variety of strategies to understand new mathematical content	a. Uses a variety of strategies to understand new mathematical content	a. Uses a variety of strategies to understand new mathematical content	a. Uses a variety of strategies to understand new mathematical content

#### Interval Benchmark 2: Justifies the process used to solve a numerical problem

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Uses reasoning to solve problems	a. Verifies solutions by logical argument	a. Provides a clear justification of a solution.	a. Justifies a solution	a. Specifies the kind of information and resources used to solve a problem	a. Specifies the kind of information and resources used to solve a problem	a. Specifies the kind of information and resources used to solve a problem	a. Specifies the kind of information and resources used to solve a problem	a. Specifies the kind of information and resources used to solve a problem	a. Specifies the kind of information and resources used to solve a problem

### Standard 2: Understands and applies concepts of numbers and operations.

#### Interval Benchmark 1: Describes the properties of numbers and number systems

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Understands the defining properties of the real number system and its subsets	a. Uses the appropriate form of a rational number (fraction, decimal,	a. Uses the appropriate form of a rational number (fraction, decimal,	a. Applies counting rules to decimals and fractions	a. Understands properties of real numbers and its subsystems	a. Understands properties of real numbers and its subsystems	a. Understands properties of real numbers and its subsystems	a. Understands properties of real numbers and its subsystems	a. Understands properties of complex numbers and its subsystems	a. Understands properties of real numbers and its subsystems

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	percent) in computations	percent) in computations							
b. Understands number theory related to factors, multiples, prime numbers, and divisibility	b. Understands the use of negative and positive numbers in computations	b. Understands the use of negative and positive numbers in computations	b. Uses number theory concepts	b. Understands the use of negative and positive numbers in computations	b. Uses the appropriate form of a rational number (fraction, decimal, percent) in computations	b. Uses the appropriate form of a rational number (fraction, decimal, percent) in computations	b. Explores new number systems, such as matrices	b. Explores new number systems, such as vectors and matrices	b. Explores new number systems, such as vectors and matrices
c. Compares fractions, decimals, and percents	c. Compares fractions, decimals, and percents	c. Compares fractions, decimals, and percents	c. Uses place value for any given number	c. Uses the appropriate form of a rational number (fraction, decimal, percent) in computations	c. Uses the properties of roots, exponents in computations	c. Uses the properties of roots, exponents in computations	c. Uses the appropriate form of a rational number (fraction, decimal, percent) in computations	c. Uses the appropriate form of a rational number (fraction, decimal, percent) in computations	c. Uses the appropriate form of a rational number (fraction, decimal, percent) in computations
d. Uses ratios and proportions to represent quantitative relationships	d. Uses ratios and proportions to represent quantitative relationships	d. Uses ratios and proportions to represent quantitative relationships	d. Compares and orders numbers	d. Uses the properties of roots, exponents in computations	d.	d.	d. Uses the properties of roots, exponents in computations	d. Uses the properties of roots, exponents in computations	d. Uses the properties of roots, exponents in computations
e. Expresses numbers using exponents	e. Expresses numbers using exponents	e. Expresses numbers using exponents	e. Represents fractions, decimals, and percents	e.	e.	e.	e.	e.	e. Uses sequences to represent and solve problems
f.	f. Understands number theory	f. Understands number theory	f. Understands fraction concepts	f.	f.	f.	f.	f.	f. Understands the properties and basic theorems of logarithms

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### Interval Benchmark 2: Understands the properties of operations

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Uses the properties of operations to simplify computations	a. Uses the properties of operations to simplify computations	a. Uses the properties of operations to simplify computations.	a. Applies order of operations	a. Uses the properties of operations to simplify computations	a. Uses the properties of operations to simplify computations	a. Uses the properties of operations to simplify computations	a. Uses the properties of operations to simplify computations	a. Uses the properties of operations to simplify computations	a. Uses the properties of operations to simplify computations
b. Uses order of operations, including grouping symbols, to simplify computations	b. Uses order of operations, including grouping symbols, to simplify computations	b. Uses order of operations, including grouping symbols, to simplify computations	b. Uses the distributive property	b. Uses the properties of operations to solve problems	b. Uses the properties of operations to solve problems	b. Uses the properties of operations to solve problems	b. Uses the properties of operations to solve problems	b. Uses the properties of operations to solve problems	b. Uses the properties of operations to solve problems

### Interval Benchmark 3: Computes fluently and makes reasonable estimates

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Uses appropriate methods to compute with fractions	a. Uses appropriate methods to compute with fractions, decimals, integers, percents	a. Uses appropriate methods to compute with fractions, decimals, integers, percents	a. Performs operations with integers, fractions, and decimals	a. Uses a variety of operations on expressions	a. Uses a variety of operations on expressions	a. Uses appropriate methods to solve triangles	a. Uses a variety of operations on expressions containing complex numbers	a. Uses a variety of operations on expressions containing complex numbers	a. Uses a variety of operations on expressions containing complex numbers
b. Uses appropriate methods to compute with decimals	b. Uses appropriate methods to solve proportions	b. Uses appropriate methods to solve proportions	b. Applies mental strategies to perform computation	b. Uses estimation strategies for computing	b.	b.	b.	b.	b.
c. Uses appropriate methods to compute with	c. Uses estimation strategies for computing	c. Uses estimation strategies for computing	c. Uses estimation strategies	c.	c.	c.	c.	c.	c.



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a. Converts measurements within a system	a. Understands the link between attribute measured and its dimension (volume, area, perimeter)	a. Understands the link between attribute measured and its dimension	a. Selects the appropriate unit for a measurement situation	a. Converts measurements between systems	a. Uses formulas to find perimeter, area, and volume of various figures	a. Converts measurements between systems	a. Uses formulas to find perimeter, area, and volume of various figures	a. Converts measurements between systems	a. Converts measurements between systems
b. Determines the perimeter and area of complex figures	b. Measures the attributes of circles	b. Compares figures using perimeter and area	b. Converts measurements within systems	b. Understands the importance of scale selection	b.	b. Understands the importance of scale selection	b.	b. Uses formulas to find perimeter, area, and volume of various figures	b. Uses formulas to find perimeter, area, and volume of various figures
c. Understands the relationship between accuracy, units, and tools	c. Understands accuracy and precision in measuring	c. Makes reasonable estimates about the accuracy of solutions	c. Uses appropriate techniques to make change	c. Uses formulas to find perimeter, area, and volume of various figures	c.	c. Uses formulas to find perimeter, area, and volume of various figures	c.	c. Makes reasonable estimates about the accuracy of solutions	c. Makes reasonable estimates about the accuracy of solutions
d.	d.		d. Determines the perimeter and area of various figures	d.	d.	d. Makes reasonable estimates about the accuracy of solutions	d.	d.	d.

### Standard 4: Understands and applies properties of geometry.

#### Interval Benchmark 1: Uses properties of figures to verify relationships

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Math Analysis Expectations	Pre-Calculus Expectations
a. Describes figures using properties of lines	a. Uses properties of lines to describe figures	a. Applies the properties of lines and angles to describe relationships	a. Classifies plane and solid figures according to their properties	a. Describes figures by their characteristics	a. Uses properties of lines to describe relationships between figures	a. Describes figures by their characteristics	a. Uses properties of conic sections to describe relationships between figures	a. Uses properties of angles to describe relationships between figures	a.



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### Interval Benchmark 3: Applies the concepts of transformation and symmetry

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Uses line symmetry to describe various figures	a. Uses rotational symmetry to describe various figures	a. Uses congruence and similarity to describe relationships among figures	a.	a. Uses various representations to describe transformations	a. Uses various representations to describe transformations	a. Uses various representations to describe transformations	a. Uses various representations to describe transformations	a. Uses various representations to describe transformations	a. Uses various representations to describe transformations
b.	b.		b.	b.	b. Describes figures in terms of their symmetry	b. Describes figures in terms of their symmetry	b.	b. Describes figures in terms of their symmetry	b. Describes figures in terms of their symmetry

### Interval Benchmark 4: Uses geometric reasoning to solve problems

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Determines the perimeter and area of complex figures	a. Uses geometric methods to complete basic geometric constructions	a. Uses the Pythagorean Theorem to explain how geometric relationships correspond to algebraic concepts	a. Determines the perimeter of figures	a. Uses formulas for perimeter, area, and volume of various figures	a. Uses formulas for perimeter, area, and volume of various figures	a. Uses proofs to build logical reasoning skills	a. Uses formulas for perimeter, area, and volume of various figures	a. Uses formulas for perimeter, area, and volume of various figures	a. Uses proofs to build logical reasoning skills
b. Uses proportional reasoning	b. Determines the circumference and area of circles	b. Compares figures using perimeter, area, and volume	b. Determines the area of figures	b.	b.	b. Uses formulas for perimeter, area, and volume of various figures	b.	b. Uses properties of triangles to prove and verify relationships	b. Uses formulas for perimeter, area, and volume of various figures
	c. Determines the area of complex figures		c.	c.	c.	c. Uses properties of triangles to prove and verify relationships	c.	c. Uses trigonometric relationships to determine lengths and angle	c. Uses properties of triangles to prove and verify relationships

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								measurements	
			d.	d.	d.	d. Uses trigonometric relationships to determine lengths and angle measurements	d.	d. Uses trigonometric relationships to determine lengths and angle measurements	d. Uses trigonometric relationships to determine lengths and angle measurements

**Standard 5: Understands and applies concepts of data analysis and probability.**

**Interval Benchmark 1: Collects, organizes, and displays data to answer a question.**

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Gathers data to answer questions	a. Gathers data to answer questions	a. Gathers data to answer questions	a. Gathers data to answer questions	a. Gathers data to answer questions	a. Gathers data to answer questions	a.	a. Gathers data to answer questions	a. Represents data to convey results	
b. Represents data to convey results	b. Represents data to convey results	b. Represents data to convey results	b. Represents data to convey results	b. Represents data to convey results	b. Represents data to convey results	b.	b. Represents data to convey results	b. Represents data to convey results	

**Interval Benchmark 2: Uses statistical methods to describe data**

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Describes data using measures of central tendency	a. Describes data using measures of central tendency	a. Describes data using central tendency and other statistical terms	a.	a.	a.	a.	a.	a. Uses different curve fitting methods to "fit" data	a. Uses different curve fitting methods to "fit" data
	b. Describes factors that affect measures of central tendency	b. Describes factors that affect measures of central tendency	b.	b.	b.	b.	b.		

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**Interval Benchmark 3: Reads and interprets data**

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Reads information from graphs	a. Reads information from graphs	a. Reads information from graphs	a. Reads information from graphs and tables	a. Reads information from graphs and tables	a. Reads information from graphs and tables	a.	a. Reads information from graphs and tables		a.
b. Reads information from tables	b. Reads information from tables	b. Reads information from tables	b. Interprets information from graphs	b. Interprets information from graphs	b. Interprets information from graphs	b.	b. Interprets information from graphs		
c. Interprets information from graphs and tables	c. Interprets information from graphs and tables	c. Interprets information from graphs and tables	c.	c.	c.	c.	c.		

**Interval Benchmark 4: Uses probability concepts**

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
	a. Determines probability of events	a. Makes predictions based on probabilities	a.	a.	a.	a.	a.		a. Uses a variety of methods to determine probabilities
			b.	b.	b.	b.	b.		b. Applies the concepts of conditional probability and independent events

**Standard 6: Understands and applies concepts of algebra and functions.**

**Interval Benchmark 1: Represents patterns and relationships in a variety of ways**

Grade Level Expectations	Grade Level Expectations	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
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	b. Uses variables and appropriate operations to write expressions		b. Uses operation properties to simplify expressions	b. Manipulates polynomial expressions	b. Manipulates polynomial expressions	b. Manipulates polynomial expressions	b. Manipulates polynomial expressions	b. Manipulates polynomial expressions	b. Manipulates polynomial and logarithmic expressions
	c. Uses rules to simplify expressions								

### Interval Benchmark 4: Uses a variety of strategies to represent and solve mathematical situations

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Solves equations involving algebraic expressions	a. Uses order of operations, including grouping symbols to solve problems	a. Uses order of operations, including grouping symbols to solve problems	a. Uses order of operations, including grouping symbols to solve problems	a. Uses a variety of methods to solve equations	a. Uses a variety of methods to solve equations	a. Uses a variety of methods to solve equations	a. Uses a variety of methods to solve equations	a. Uses a variety of methods to graph linear equations and inequalities	a. Uses a variety of methods to solve equations
	b. Solves equations involving algebraic expressions	b. Solves equations involving algebraic expressions	b.	b. Applies properties of exponents, squares, and square roots to solve problems	b. Uses a variety of methods to solve quadratic equations	b. Uses a variety of methods to solve quadratic equations	b. Uses a variety of methods to solve quadratic equations	b. Uses a variety of methods to solve systems of equations	b. Uses a variety of methods to solve quadratic equations
		c. Applies properties of exponents, squares, and square roots to solve problems	c.	c. Uses a variety of methods to graph linear equations and inequalities	c. Uses a variety of methods to graph linear equations and inequalities	c. Uses a variety of methods to solve systems of equations	c. Uses a variety of methods to graph linear equations and inequalities		c. Uses a variety of methods to graph linear and nonlinear equations and inequalities
		d. Solves simple inequalities and linear equations	d.	d. Uses a variety of methods to solve systems of equations	d. Uses a variety of methods to solve systems of equations	d.	d. Uses a variety of methods to solve systems of equations		d. Uses a variety of methods to solve systems of equations

### Interval Benchmark 5: Describes change in a variety of situations

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Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
	a. Uses line graphs to analyze change	a. Uses line graphs to analyze change	a.	a.	a.	a. Uses a variety of representations to analyze change	a. Uses a variety of representations to analyze change	a.	a. Uses a variety of representations to analyze change

### Standard 7: Communicates and reasons mathematically.

#### Interval Benchmark 1: Comprehends mathematical language

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Comprehends mathematical texts	a. Comprehends mathematical texts	a. Comprehends mathematical texts	a. Comprehends mathematical texts	a. Comprehends mathematical texts	a. Comprehends mathematical texts	a. Comprehends mathematical texts	a. Comprehends mathematical texts	a. Comprehends mathematical texts	a. Comprehends mathematical texts

#### Interval Benchmark 2: Expresses ideas using mathematical terms and representations

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Connects ideas to mathematical terms	a. Connects ideas to mathematical terms	a. Connects ideas to mathematical terms	a. Connects ideas to mathematical terms	a. Connects ideas to mathematical terms	a. Connects ideas to mathematical terms	a. Connects ideas to mathematical terms	a. Connects ideas to mathematical terms	a. Connects ideas to mathematical terms	a. Connects ideas to mathematical terms

#### Interval Benchmark 3: Analyzes and evaluates mathematical thinking

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Reviews mathematical thinking	a. Reviews mathematical thinking	a. Reviews mathematical thinking	a. Reviews mathematical thinking	a. Reviews mathematical thinking	a. Reviews mathematical thinking	a. Reviews mathematical thinking	a. Reviews mathematical thinking	a. Reviews mathematical thinking	a. Reviews mathematical thinking

#### Interval Benchmark 4: Uses technology to enhance mathematical learning

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Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Uses tools and technology to solve problems	a. Uses tools and technology to solve problems	a. Uses tools and technology to solve problems	a. Uses tools and technology to solve problems	a.	a. Uses tools and technology to solve problems	a. Uses tools and technology to solve problems	a. Uses tools and technology to solve problems	a. Uses tools and technology to solve problems	a. Uses tools and technology to solve problems

### Standard 8: Understands the general nature and uses of mathematics.

#### Interval Benchmark 1: Uses a variety of methods to represent mathematical ideas and concepts in practical ways.

#### Interval Benchmark 1: Uses mathematics to study relationships in realistic situations.

Grade Level Expectations 6	Grade Level Expectations 7	Grade Level Expectations 8	General Math Expectations	Pre-Algebra Expectations	Algebra I Expectations	Geometry Expectations	Algebra II Expectations	Analysis Expectations	Pre-Calculus Expectations
a. Demonstrates that mathematical ideas and concepts can be represented concretely, graphically, and symbolically	a. Demonstrates that mathematical ideas and concepts can be represented concretely, graphically, and symbolically	a. Demonstrates that mathematical ideas and concepts can be represented concretely, graphically, and symbolically	a. Demonstrates that mathematical ideas and concepts can be represented concretely, graphically, and symbolically	a. Demonstrates how mathematics is the study of any pattern or relationship	a. Demonstrates how mathematics is the study of any pattern or relationship	a. Shows how mathematics can be used to model the natural world	a. Demonstrates that mathematics provides a precise system to describe objects, events, and relationships to construct logical arguments	a. Demonstrates that mathematics provides a precise system to describe objects, events, and relationships to construct logical arguments	a. Demonstrates that mathematics provides a precise system to describe objects, events, and relationships to construct logical arguments
b.	b.	b. Explains how mathematics has been helpful in practical ways for many centuries	b.	b. Explains how mathematics began long ago to help solve practical problems	b. Explains how mathematics began long ago to help solve practical problems	b.	b.	b.	b.