

Mathematics

Prepared Graduate Competencies at Grade Levels

Understand the structure and properties of our number system. At the most basic level numbers are abstract symbols that represent real-world quantities.		
Grade Level	Numbering System	Grade Level Expectations
High School	MA10-GR.HS-S.1-GLE.1	The complex number system includes real numbers and imaginary numbers
Eighth Grade	MA10-GR.8-S.1-GLE.1	In the real number system, rational and irrational numbers are in one to one correspondence to points on the number line
Sixth Grade	MA10-GR.6-S.1-GLE.3	In the real number system, rational numbers have a unique location on the number line and in space
Fifth Grade	MA10-GR.5-S.1-GLE.1	The decimal number system describes place value patterns and relationships that are repeated in large and small numbers and forms the foundation for efficient algorithms
	MA10-GR.5-S.1-GLE.4	The concepts of multiplication and division can be applied to multiply and divide fractions
Fourth Grade	MA10-GR.4-S.1-GLE.1	The decimal number system to the hundredths place describes place value patterns and relationships that are repeated in large and small numbers and forms the foundation for efficient algorithms
Third Grade	MA10-GR.3-S.1-GLE.1	The whole number system describes place value relationships and forms the foundation for efficient algorithms
Second Grade	MA10-GR.2-S.1-GLE.1	The whole number system describes place value relationships through 1,000 and forms the foundation for efficient algorithms
First Grade	MA10-GR.1-S.1-GLE.1	The whole number system describes place value relationships within and beyond 100 and forms the foundation for efficient algorithms
Kindergarten	MA10-GR.K-S.1-GLE.1	Whole numbers can be used to name, count, represent, and order quantity

Mathematics

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Understand quantity through estimation, precision, order of magnitude, and comparison. The reasonableness of answers relies on the ability to judge appropriateness, compare, estimate, and analyze error.		
Grade Level	Numbering System	Grade Level Expectations
High School	MA10-GR.HS-S.1-GLE.2	Quantitative reasoning is used to make sense of quantities and their relationships in problem situations
Seventh Grade	MA10-GR.7-S.4-GLE.2	Linear measure, angle measure, area, and volume are fundamentally different and require different units of measure
Fifth Grade	MA10-GR.5-S.4-GLE.1	Properties of multiplication and addition provide the foundation for volume an attribute of solids.
Fourth Grade	MA10-GR.4-S.4-GLE.1	Appropriate measurement tools, units, and systems are used to measure different attributes of objects and time
Third Grade	MA10-GR.3-S.4-GLE.2	Linear and area measurement are fundamentally different and require different units of measure
	MA10-GR.3-S.4-GLE.3	Time and attributes of objects can be measured with appropriate tools
Second Grade	MA10-GR.2-S.4-GLE.2	Some attributes of objects are measurable and can be quantified using different tools
First Grade	MA10-GR.1-S.4-GLE.2	Measurement is used to compare and order objects and events
Kindergarten	MA10-GR.K-S.4-GLE.2	Measurement is used to compare and order objects
Preschool	MA10-GR.P-S.1-GLE.1	Quantities can be represented and counted
	MA10-GR.P-S.4-GLE.2	Measurement is used to compare objects

Mathematics

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Are fluent with basic numerical and symbolic facts and algorithms, and are able to select and use appropriate (mental math, paper and pencil, and technology) methods based on an understanding of their efficiency, precision, and transparency		
Grade Level	Numbering System	Grade Level Expectations
High School	MA10-GR.HS-S.2-GLE.4	Solutions to equations, inequalities and systems of equations are found using a variety of tools
Eight Grade	MA10-GR.8-S.2-GLE.2	Properties of algebra and equality are used to solve linear equations and systems of equations
Seventh Grade	MA10-GR.7-S.1-GLE.2	Formulate, represent, and use algorithms with rational numbers flexibly, accurately, and efficiently
Sixth Grade	MA10-GR.6-S.1-GLE.2	Formulate, represent, and use algorithms with positive rational numbers with flexibility, accuracy, and efficiency
Fifth Grade	MA10-GR.5-S.1-GLE.2	Formulate, represent, and use algorithms with multi-digit whole numbers and decimals with flexibility, accuracy, and efficiency
	MA10-GR.5-S.1-GLE.3	Formulate, represent, and use algorithms to add and subtract fractions with flexibility, accuracy, and efficiency
Fourth Grade	MA10-GR.4-S.1-GLE.3	Formulate, represent, and use algorithms to compute with flexibility, accuracy, and efficiency
Third Grade	MA10-GR.3-S.1-GLE.3	Multiplication and division are inverse operations and can be modeled in a variety of ways
Second Grade	MA10-GR.2-S.1-GLE.2	Formulate, represent, and use strategies to add and subtract within 100 with flexibility, accuracy, and efficiency

Mathematics

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Make both relative (multiplicative) and absolute (arithmetic) comparisons between quantities. Multiplicative thinking underlies proportional reasoning.

Grade Level	Numbering System	Grade Level Expectations
Seventh Grade	MA10-GR.7-S.1-GLE.1	Proportional reasoning involves comparisons and multiplicative relationships among ratios
Sixth Grade	MA10-GR.6-S.1-GLE.1	Quantities can be expressed and compared using ratios and rates

Recognize and make sense of the many ways that variability, chance, and randomness appear in a variety of contexts

Grade Level	Numbering System	Grade Level Expectations
High School	MA10-GR.HS-S.3-GLE.3	Probability models outcomes for situations in which there is inherent randomness
Seventh Grade	MA10-GR.7-S.3-GLE.2	Mathematical models are used to determine probability

Mathematics

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Solve problems and make decisions that depend on understanding, explaining, and quantifying the variability in data

Grade Level	Numbering System	Grade Level Expectations
High School	MA10-GR.HS-S.3-GLE.1	Visual displays and summary statistics condense the information in data sets into usable knowledge
Eighth Grade	MA10-GR.8-S.3-GLE.1	Visual displays and summary statistics of two-variable data condense the information in data sets into usable knowledge
Sixth Grade	MA10-GR.6-S.3-GLE.1	Visual displays and summary statistics of one-variable data condense the information in data sets into usable knowledge
Fifth Grade	MA10-GR.5-S.3-GLE.1	Visual displays are used to interpret data
Fourth Grade	MA10-GR.4-S.3-GLE.1	Visual displays are used to represent data
Third Grade	MA10-GR.3-S.3-GLE.1	Visual displays are used to describe data
Second Grade	MA10-GR.2-S.3-GLE.1	Visual displays of data can be constructed in a variety of formats to solve problems
First Grade	MA10-GR.1-S.3-GLE.1	Visual displays of information can be used to answer questions

Understand that equivalence is a foundation of mathematics represented in numbers, shapes, measures, expressions, and equations

Grade Level	Numbering System	Grade Level Expectations
High School	MA10-GR.HS-S.2-GLE.3	Expressions can be represented in multiple, equivalent forms
High School	MA10-GR.HS-S.2-GLE.1	Linear functions model situations with a constant rate of change and can be represented numerically, algebraically, and graphically
Seventh Grade	MA10-GR.7-S.2-GLE.1	Properties of arithmetic can be used to generate equivalent expressions
Fourth Grade	MA10-GR.4-S.1-GLE.2	Different models and representations can be used to compare fractional parts
Third Grade	MA10-GR.3-S.1-GLE.2	Parts of a whole can be modeled and represented in different ways

Mathematics

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Make sound predictions and generalizations based on patterns and relationships that arise from numbers, shapes, symbols, and data

Grade Level	Numbering System	Grade Level Expectations
High School	MA10-GR.HS-S.2-GLE.1	Functions model situations where one quantity determines another and can be represented algebraically, graphically, and using tables
Fifth Grade	MA10-GR.5-S.2-GLE.1	Number patterns are based on operations and relationships
Fourth Grade	MA10-GR.4-S.2-GLE.1	Number patterns and relationships can be represented by symbols
Preschool	MA10-GR.P-S.4-GLE.1	Shapes can be observed in the world and described in relation to one another

Apply transformation to numbers, shapes, functional representations, and data

Grade Level	Numbering System	Grade Level Expectations
High School	MA10-GR.HS-S.4-GLE.1	Objects in the plane can be transformed, and those transformations can be described and analyzed mathematically
High School	MA10-GR.HS-S.4-GLE.3	Objects in the plane can be described and analyzed algebraically
Eighth Grade	MA10-GR.8-S.4-GLE.1	Transformations of objects can be used to define the concepts of congruence and similarity
Seventh Grade	MA10-GR.7-S.4-GLE.1	Modeling geometric figures and relationships leads to informal spatial reasoning and proof
Second Grade	MA10-GR.2-S.4-GLE.1	Shapes can be described by their attributes and used to represent part/whole relationships
First Grade	MA10-GR.1-S.1-GLE.2	Number relationships can be used to solve addition and subtraction problems
Kindergarten	MA10-GR.K-S.1-GLE.2	Composing and decomposing quantity forms the foundation for addition and subtraction

Mathematics

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Make claims about relationships among numbers, shapes, symbols, and data and defend those claims by relying on the properties that are the structure of mathematics

Grade Level	Numbering System	Grade Level Expectations
High School	MA10-GR.HS-S.4-GLE.4	Attributes of two- and three-dimensional objects are measurable and can be quantified
Sixth Grade	MA10-GR.6-S.2-GLE.1	Algebraic expressions can be used to generalize properties of arithmetic
	MA10-GR.6-S.2-GLE.2	Variables are used to represent unknown quantities within equations and inequalities
	MA10-GR.6-S.4-GLE.1	Objects in space and their parts and attributes can be measured and analyzed
Fifth Grade	MA10-GR.5-S.4-GLE.2	Geometric figures can be described by their attributes and specific locations in the plane
Fourth Grade	MA10-GR.4-S.4-GLE.2	Geometric figures in the plane and in space are described and analyzed by their attributes
Third Grade	MA10-GR.3-S.4-GLE.1	Geometric figures are described by their attributes
First Grade	MA10-GR.1-S.4-GLE.1	Shapes can be described by defining attributes and created by composing and decomposing
Kindergarten	MA10-GR.K-S.4-GLE.1	Shapes can be described by characteristics and position and created by composing and decomposing

Communicate effective logical arguments using mathematical justification and proof. Mathematical argumentation involves making and testing conjectures, drawing valid conclusions, and justifying thinking.

This prepared graduate competency is addressed through all of the grade level expectations and is part of the mathematical practices.

Mathematics

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Use critical thinking to recognize problematic aspects of situations, create mathematical models, and present and defend solutions		
Grade Level	Numbering System	Grade Level Expectations
High School	MA10-GR.HS-S.2-GLE.2	Quantitative relationships in the real world can be modeled and solved using functions
	MA10-GR.HS-S.3-GLE.2	Statistical methods take variability into account supporting informed decisions making through quantitative studies designed to answer specific questions
	MA10-GR.HS-S.4-GLE.2	Concepts of similarity are foundational to geometry and its applications
	MA10-GR.HS-S.4-GLE.5	Objects in the real world can be modeled using geometric concepts
Eighth Grade	MA10-GR.8-S.2-GLE.3	Graphs, tables and equations can be used to distinguish between linear and nonlinear functions
	MA10-GR.8-S.4-GLE.2	Direct and indirect measurement can be used to describe and make comparisons
Seventh Grade	MA10-GR.7-S.2-GLE.2	Equations and expressions model quantitative relationships and phenomena
	MA10-GR.7-S.3-GLE.1	Statistics can be used to gain information about populations by examining samples