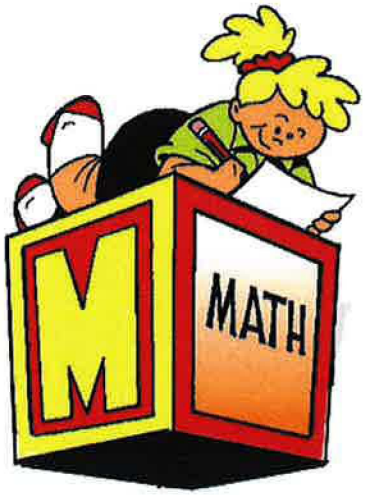
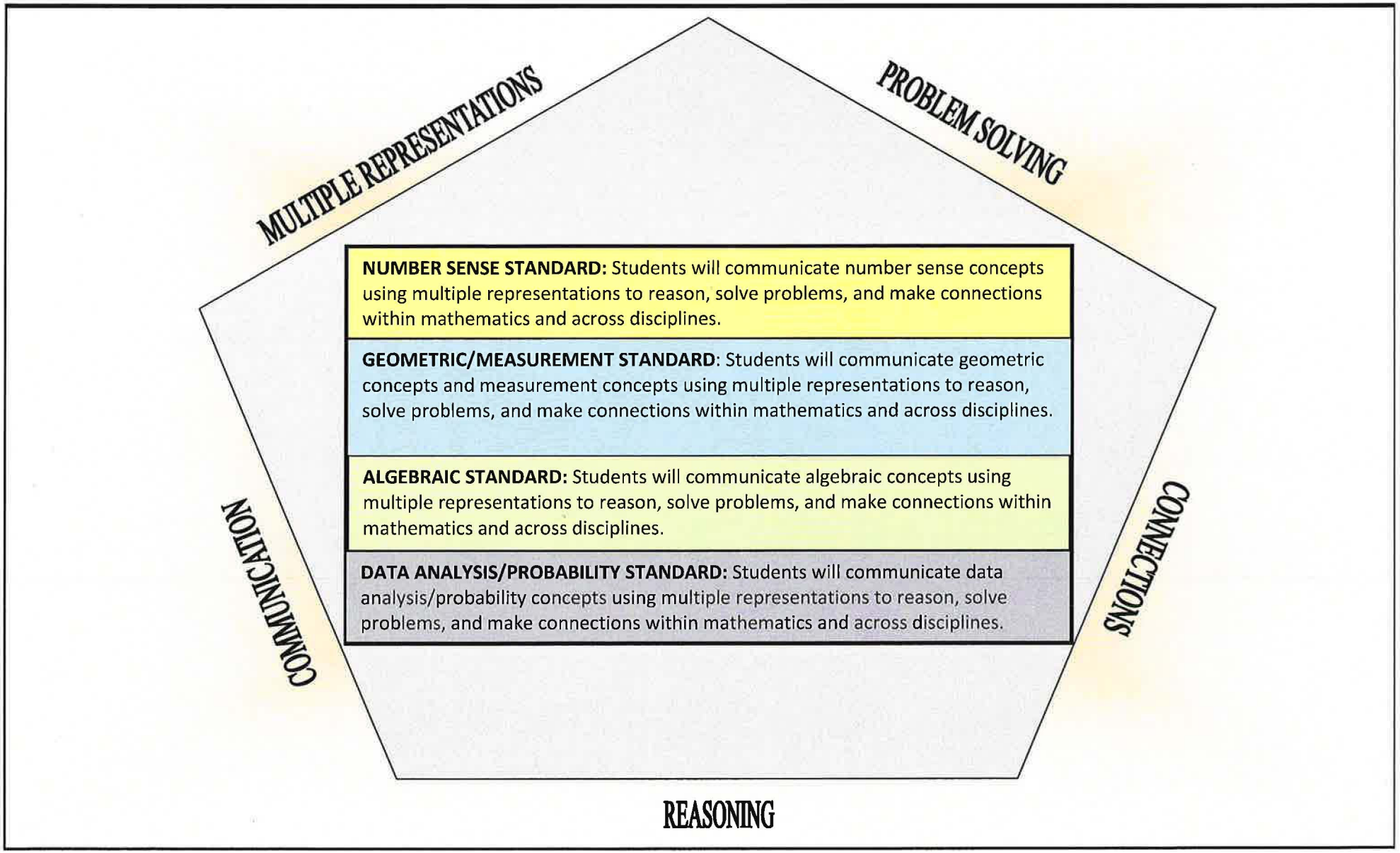
Nebraska



Mathematics Standards

As Approved By State Board
October 8, 2009

Nebraska Mathematics Standards Overview



Nebraska Mathematics Standards Concepts

K-12 Comprehensive Number Sense Standard:
Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

- **Number System**
- **Operations**
- **Computation**
- **Estimation**

K-12 Comprehensive Geometric/Measurement Standard:
Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

- **Characteristics**
- **Coordinate Geometry**
- **Transformations**
- **Spatial Modeling**
- **Measurement**

K-12 Comprehensive Algebraic Standard:
Students will communicate algebraic concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

- **Relationships**
- **Modeling in Context**
- **Procedures**

K-12 Comprehensive Data Analysis/Probability Standard:
Students will communicate data analysis/probability concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

- **Display and Analysis**
- **Predictions and Inferences**
- **Probability**

K- 12 Comprehensive NUMBER SENSE Standard:

Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

CONCEPTS	Grade Level Standards				
	KINDERGARTEN	Grade 1	Grade 2	Grade 3	Grade 4
Number system	Students will demonstrate, represent, and show relationships among whole numbers within the base-ten number system.	Students will demonstrate, represent, and show relationships among whole numbers within the base-ten number system.	Students will demonstrate, represent, and show relationships among whole numbers within the base-ten number system.	Students will represent and show relationships among positive rational numbers within the base-ten number system.	Students will represent and show relationships among positive rational numbers within the base-ten number system.
Operations	Students will demonstrate the meaning of addition and subtraction with whole numbers.	Students will demonstrate the meaning of addition and subtraction with whole numbers.	Students will demonstrate the meaning of addition and subtraction with whole numbers.	Students demonstrate the meaning of multiplication with whole numbers.	Students will demonstrate the meaning of division with whole numbers.
Computation	Mastery not expected at this level.	Students will compute fluently and accurately using appropriate strategies and tools.	Students will compute fluently and accurately using appropriate strategies and tools.	Students will compute fluently and accurately using appropriate strategies and tools.	Students will compute fluently and accurately using appropriate strategies and tools.
Estimation	Mastery not expected at this level.	Mastery not expected at this level.	Students will estimate and check reasonableness of answers using appropriate strategies and tools.	Students will estimate and check reasonableness of answers using appropriate strategies and tools.	Students will estimate and check reasonableness of answers using appropriate strategies and tools.

K- 12 Comprehensive NUMBER SENSE Standard:

Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

CONCEPTS	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Number system	Students will represent and show relationships among positive rational numbers.	Students will represent and show relationships among positive rational numbers and integers.	Students will represent and show relationships among rational numbers.	Students will represent and show relationships among real numbers.	Students will represent and show relationships among complex numbers.
Operations	Students will demonstrate the meaning of arithmetic operations with whole numbers.	Students will demonstrate the meaning of arithmetic operations with positive fractions and decimals.	Students will demonstrate the meaning of arithmetic operations with positive fractions, decimals, and integers.	Students will demonstrate the meaning of arithmetic operations with integers.	Students will demonstrate the meaning and effects of arithmetic operations with real numbers.
Computation	Students will compute fluently and accurately using appropriate strategies and tools.	Students will compute fluently and accurately using appropriate strategies and tools.	Students will compute fluently and accurately using appropriate strategies and tools.	Students will compute fluently and accurately using appropriate strategies and tools.	Students will compute fluently and accurately using appropriate strategies and tools.
Estimation	Students will estimate and check reasonableness of answers using appropriate strategies and tools.	Students will estimate and check reasonableness of answers using appropriate strategies and tools.	Students will estimate and check reasonableness of answers using appropriate strategies and tools.	Students will estimate and check reasonableness of answers using appropriate strategies and tools.	Students will estimate and check reasonableness of answers using appropriate strategies and tools.

MA K-12.1 Comprehensive NUMBER SENSE Standard:
Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

CONCEPTS	Grade Level Standards				
	KINDERGARTEN	Grade 1	Grade 2	Grade 3	Grade 4
Number system	**MA 0.1.1 Students will demonstrate, represent, and show relationships among whole numbers within the base-ten number system.**	**MA 1.1.1 Students will demonstrate, represent, and show relationships among whole numbers within the base-ten number system.**	**MA 2.1.1 Students will demonstrate, represent, and show relationships among whole numbers within the base-ten number system.**	**MA 3.1.1 Students will represent and show relationships among positive rational numbers within the base-ten number system.**	**MA 4.1.1 Students will represent and show relationships among positive rational numbers within the base-ten number system.**
Curricular Indicators	MA 0.1.1.a Count, read, and write numbers 0 – 20 MA 0.1.1.b Count objects using one-to-one correspondence 0 – 20 MA 0.1.1.c Sequence objects using ordinal numbers (first through fifth) MA 0.1.1.d Match numerals to the quantities they represent 0 – 20, using a variety of models and representations	MA 1.1.1.a Count, read and write numbers 0 – 100 MA 1.1.1.b Count by multiples of 2 up to 50 MA 1.1.1.c Count by multiples of 5 up to 100 MA 1.1.1.d Count by multiples of 10 up to 100 MA 1.1.1.e Sequence objects using ordinal numbers (first through tenth) MA 1.1.1.f Count backwards from 10 – 0 MA 1.1.1.g Connect number words to the quantities they represent 0 – 20	MA 2.1.1.a Read and write numbers 0 – 1,000 (e.g., count numbers from 400 – 500; write numbers from 400 – 500) MA 2.1.1.b Count by multiples of 2 up to 100 MA 2.1.1.c Count backwards from 20 – 0 MA 2.1.1.d Connect number words to the quantities they represent 0 – 100 MA 2.1.1.e Demonstrate	MA 3.1.1.a Read and write numbers to one-hundred thousand (e.g., 4,623 is the same as four thousand six hundred twenty three) MA 3.1.1.b Count by multiples of 5 to 200 MA 3.1.1.c Count by multiples of 10 to 400 MA 3.1.1.d Count by multiples of 100 to 1,000 MA 3.1.1.e Demonstrate multiple equivalent representations for	MA 4.1.1.a Read and write numbers through the millions (e.g., 2,347,589 is the same as 2 million three hundred forty seven thousand five hundred eighty nine) MA 4.1.1.b Demonstrate multiple equivalent representations for

	MA 0.1.1.e Demonstrate and identify multiple equivalent representations for numbers 1 – 10 (e.g., 10 is 1 and 9;10 is 6 and 4) MA 0.1.1.f Demonstrate relative position of whole numbers 0 – 10 (e.g., 5 is between 2 and 10; 7 is greater than 3)	MA 1.1.1.h Demonstrate and identify multiple equivalent representations for numbers 1 – 100 (e.g., 23 is 2 tens and 3 ones; 23 is 1 ten and 13 ones; 23 is 23 ones) MA 1.1.1.i Compare and order whole numbers 0 – 100 MA 1.1.1.j Demonstrate relative position of whole numbers 0 – 100 (e.g., 52 is between 50 and 60; 83 is greater than 77)	multiple equivalent representations for numbers 1 – 1,000 (e.g., 423 is 4 hundreds, 2 tens and 3 ones; 423 is 3 hundreds 12 tens and 3 ones) MA 2.1.1.f Compare and order whole numbers 0 – 1,000 MA 2.1.1.g Demonstrate relative position of whole numbers 0 – 1,000 (e.g., 624 is between 600 and 700; 593 is greater than 539) MA 2.1.1.h Use visual models to represent fractions of one-half as a part of a whole	numbers up to 10,000 (e.g., 10 tens is 1 hundred; 10 ten thousands is 1 hundred thousand; 2,350 is 235 tens; 2,350 is 2,000 + 300 + 50; 2,350 is 23 hundreds and 5 tens) MA 3.1.1.f Demonstrate multiple equivalent representations for decimal numbers through the tenths place (e.g., 3 and 6 tenths is 3.6; 7.4 is 7 + .4) MA 3.1.1.g Compare and order whole numbers through the thousands MA 3.1.1.h Find parts of whole and parts of a set for ½, ⅓, or ¼ MA 3.1.1.i Round a given number to tens, hundreds, or thousands	decimal numbers through the hundredths place (e.g., 2 and 5 hundredths is 2.05; 6.23 is 6 + .2 +.03) MA 4.1.1.c Compare and order whole numbers and decimals through the hundredths place (e.g., money) MA 4.1.1.d Classify a number as even or odd MA 4.1.1.e Represent a fraction as parts of a whole and/or parts of a set MA 4.1.1.f Use visual models to find equivalent fractions (e.g., $\frac{2}{4}=\frac{1}{2}, \frac{2}{8}=\frac{1}{4}, 1=\frac{2}{2}=\frac{5}{5}, \frac{3}{3}$ MA 4.1.1.g Determine the size of a fraction relative to one half using equivalent forms (e.g., Is 3/8 more or less than one half?) MA 4.1.1.h Locate fractions on a number line MA 4.1.1.i Round a whole number to millions

MA K-12.1 Comprehensive NUMBER SENSE Standard:
Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

CONCEPTS	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Number system	**MA 5.1.1 Students will represent and show relationships among positive rational numbers.**	**MA 6.1.1 Students will represent and show relationships among positive rational numbers and integers.**	**MA 7.1.1 Students will represent and show relationships among rational numbers.**	**MA 8.1.1 Students will represent and show relationships among real numbers.**	**MA 12.1.1 Students will represent and show relationships among complex numbers.**
Curricular Indicators	MA 5.1.1.a Demonstrate multiple equivalent representations for whole numbers and decimals through the thousandths place (e.g., 3.125 is 3 + .1 + .02 + .005) MA 5.1.1.b Compare and order whole numbers, fractions, and decimals through the thousandths place MA 5.1.1.c Identify and name fractions in their simplest form and find common denominators for fractions MA 5.1.1.d Recognize and generate equivalent forms of commonly used fractions, decimals, and percents (e.g., one third, one fourth, one half, two thirds, three fourths)	MA 6.1.1.a Show equivalence among common fractions, decimals and percents MA 6.1.1.b Compare and order positive and negative integers MA 6.1.1.c Identify integers less than 0 on a number line MA 6.1.1.d Represent large numbers using exponential notation (e.g., 1,000 = 10^3) MA 6.1.1.e Identify the prime factorization of numbers (e.g., 12 = 2 x 2 x 3 or 2^2 x 3) MA 6.1.1.f Classify	MA 7.1.1.a Show equivalence among fractions, decimals, and percents MA 7.1.1.b Compare and order rational numbers (e.g., fractions, decimals, percents) MA 7.1.1.c Represent large numbers using scientific notation	MA 8.1.1.a Compare and order real numbers MA 8.1.1.b Demonstrate relative position of real numbers on the number line (e.g., square root of 2 is left of 1.5) MA 8.1.1.c Represent small numbers using scientific notation	MA 12.1.1.a Demonstrate multiple equivalent forms of irrational numbers (e.g., $\sqrt{8} = 8^{1/2} = 2\sqrt{2}$) MA 12.1.1.b Compare, contrast and apply the properties of numbers and the real number system, including the rational, irrational , imaginary, and complex numbers

	MA 5.1.1.e Classify a number as prime or composite MA 5.1.1.f Identify factors and multiples of any whole number MA 5.1.1.g Round whole numbers and decimals to any given place	numbers as natural, whole, or integer	MA 7.1.1.d Classify numbers as natural, whole, integer, or rational MA 7.1.1.e Find least common multiple and greatest common divisor given two numbers	MA 8.1.1.d Classify numbers as natural, whole, integer, rational, irrational, or real	

MA K-12.1 Comprehensive NUMBER SENSE Standard:
Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

CONCEPTS	Grade Level Standards				
	KINDERGARTEN	Grade 1	Grade 2	Grade 3	Grade 4
Operations	**MA 0.1.2 Students will demonstrate the meaning of addition and subtraction with whole numbers.**	**MA 1.1.2 Students will demonstrate the meaning of addition and subtraction with whole numbers.**	**MA 2.1.2 Students will demonstrate the meaning of addition and subtraction with whole numbers.**	**MA 3.1.2 Students demonstrate the meaning of multiplication with whole numbers.**	**MA 4.1.2 Students will demonstrate the meaning of division with whole numbers.**
Curricular Indicators	MA 0.1.2.a Use objects and words to explain the meaning of addition as a joining action (e.g., Two girls are sitting at a table. Two more girls join them. How many girls are sitting at the table?) MA 0.1.2.b Use objects and words to explain the meaning of addition as parts of a whole (e.g., Three boys and two girls are going to the zoo. How many children are going to the zoo?) MA 0.1.2.c Use objects and words to explain the meaning of subtraction as a separation action (e.g., Five girls are sitting at a table. Two girls leave. How many girls are left sitting at the table?) MA 0.1.2.d Use objects and words to explain the	MA 1.1.2.a Use objects, drawings, words, and symbols to explain addition as a joining action MA 1.1.2.b Use objects, drawings, words, and symbols to explain addition as parts of a whole MA 1.1.2.c Use objects, drawings, words, and symbols to explain subtraction as a separation action MA 1.1.2.d Use drawings, words, and symbols to explain subtraction as finding part of a whole MA 1.1.2.e Use objects, drawings, words, and symbols to explain subtraction as a comparison (e.g., Nancy has 8 hair ribbons. Jane has 5 hair ribbons. How	MA 2.1.2.a Use objects, drawings, words, and symbols to explain the relationship between addition and subtraction (e.g., if 2 + 3 = 5 then 5 – 3 = 2) MA 2.1.2.b Use objects, drawings, words, and symbols to explain the use of subtraction to find a missing addend (e.g., if 3 + __ = 7, then 7- 3 = __.)	MA 3.1.2.a Represent multiplication as repeated addition using objects, drawings, words, and symbols (e.g., 3 x 4 = 4 + 4 + 4) MA 3.1.2.b Use objects, drawings, words, and symbols to explain the relationship between multiplication and division (e.g., if 3 x 4 = 12 then 12 ÷ 3 = 4.) MA 3.1.2.c Use drawings, words, and symbols to explain the meaning of the factors and product in a multiplication sentence (e.g., in 3 x 4 = 12, 3 and 4 are factors and 12 is the total or product. The first factor (3) tells how many sets while the second factor tells how many are in each set. Another way to say this is that 3 groups of 4 equals 12 total.)	MA 4.1.2.a Use drawings, words, and symbols to explain the meaning of division [(e.g., as repeated subtraction: Sarah has 24 candies. She put them into bags of 6 candies each. How many bags did Sarah use?) (e.g., as equal sharing: Paul has 24 candies. He wants to share them equally among his 6 friends. How many candies will each friend receive?)]

	meaning of subtraction as finding part of a whole (e.g., Jacob has 5 pencils. Three are blue and the rest are red. How many red pencils does Jacob have?)	many more hair ribbons does Nancy have than Jane?)		MA 3.1.2.d Use drawings, words and symbols to explain the meaning of multiplication using an array (e.g., an array with 3 rows and 4 columns represents the multiplication sentence 3 x 4 = 12)	

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CONCEPTS	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Operations	**MA 5.1.2 Students will demonstrate the meaning of arithmetic operations with whole numbers.**	**MA 6.1.2 Students will demonstrate the meaning of arithmetic operations with positive fractions and decimals.**	**MA 7.1.2 Students will demonstrate the meaning of arithmetic operations with positive fractions, decimals, and integers.**	**MA 8.1.2 Students will demonstrate the meaning of arithmetic operations with integers.**	**MA 12.1.2 Students will demonstrate the meaning and effects of arithmetic operations with real numbers.**
Curricular Indicators	MA 5.1.2.a Use words and symbols to explain the meaning of the identity properties for addition and multiplication MA 5.1.2.b Use words and symbols to explain the meaning of the commutative and associative properties of addition and multiplication MA 5.1.2.c Use words and symbols to explain the distributive property of multiplication over addition (e.g., 5 (y + 2) = 5y + 5 x 2)	MA 6.1.2.a Use drawings, words, and symbols to explain the meaning of addition and subtraction of fractions MA 6.1.2.b Use drawings, words, and symbols to explain the meaning of addition and subtraction of decimals	MA 7.1.2.a Use drawings, words, and symbols to explain the meaning of multiplication and division of fractions (e.g., 2/3 x 6 as two-thirds of six, or 6 x 2/3 as 6 groups of two-thirds, or 6 ÷ 2/3 as how many two-thirds there are in six.) MA 7.1.2.b Use drawings, words, and symbols to explain the meaning of multiplication and division of decimals MA 7.1.2.c Use drawings, words, and symbols to explain the addition and subtraction of integers	MA 8.1.2.a Use drawings, words, and symbols to explain the meaning of addition, subtraction, multiplication, and division of integers. MA 8.1.2.b Use words and symbols to explain the zero property of multiplication (e.g., if ab = 0 then a or b or both must be zero) MA 8.1.2.c Use words and symbols to explain why division by zero is undefined	MA 12.1.2.a Use drawings, words, and symbols to explain the effects of such operations as multiplication and division, and computing positive powers and roots on the magnitude of quantities (e.g., if you take the square root of a number, will the result always be smaller than the original number? (e.g., $\sqrt{1/4} = 1/2$)) MA 12.1.2.b Use drawings, words, and symbols to explain that the distance between two numbers on the number line is the absolute value of their difference

MA K-12.1 Comprehensive NUMBER SENSE Standard:
Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

CONCEPTS	Grade Level Standards				
	KINDERGARTEN	Grade 1	Grade 2	Grade 3	Grade 4
Computation	**MA 0.1.3 Mastery not expected at this level.**	**MA 1.1.3 Students will compute fluently and accurately using appropriate strategies and tools.**	**MA 2.1.3 Students will compute fluently and accurately using appropriate strategies and tools.**	**MA 3.1.3 Students will compute fluently and accurately using appropriate strategies and tools.**	**MA 4.1.3 Students will compute fluently and accurately using appropriate strategies and tools.**
Curricular Indicators		MA 1.1.3.a Fluently add whole number sums up to 10 MA 1.1.3.b Fluently subtract whole number differences from 10 MA 1.1.3.c Add and subtract two-digit numbers without regrouping MA 1.1.3.d Use a variety of methods and tools to compute sums and differences (e.g., models, mental computation, paper-pencil)	MA 2.1.3.a Fluently add whole number facts with sums to 20 MA 2.1.3.b Fluently subtract whole number facts with differences from 20 MA 2.1.3.c Add and subtract three-digit whole numbers with regrouping MA 2.1.3.d Use a variety of methods and tools to compute sums and differences (e.g., models, mental computation, paper–pencil)	MA 3.1.3.a Compute whole number multiplication facts 0 – 10 fluently MA 3.1.3.b Add and subtract through four-digit whole numbers with regrouping MA 3.1.3.c Select and apply the appropriate method of computation when problem solving with four-digit whole numbers through the thousands (e.g., models, mental computation, paper-pencil)	MA 4.1.3.a Compute whole number division facts 0 – 10 fluently MA 4.1.3.b Add and subtract decimals to the hundredths place (e.g., money) MA 4.1.3.c Multiply two-digit whole numbers MA 4.1.3.d Divide a three-digit number with one digit divisor with and without a remainder MA 4.1.3.e Mentally compute multiplication and division involving powers of 10 MA 4.1.3.f Select and apply the appropriate method of computation when problem solving (e.g., models, mental computation, paper-pencil)

MA K-12.1 Comprehensive NUMBER SENSE Standard:
Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

CONCEPTS	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Computation	**MA 5.1.3 Students will compute fluently and accurately using appropriate strategies and tools.**	**MA 6.1.3 Students will compute fluently and accurately using appropriate strategies and tools.**	**MA 7.1.3 Students will compute fluently and accurately using appropriate strategies and tools.**	**MA 8.1.3 Students will compute fluently and accurately using appropriate strategies and tools.**	**MA 12.1.3 Students will compute fluently and accurately using appropriate strategies and tools.**
Curricular Indicators	MA 5.1.3.a Add and subtract positive rational numbers (e.g., proper and improper fractions, mixed numbers, fractions with common and uncommon denominators, decimals through the thousandths place) MA 5.1.3.b Select, apply and explain the appropriate method of computation when problem solving (e.g., models, mental computation, paper-pencil, technology) MA 5.1.3.c Multiply decimals MA 5.1.3.d Divide a decimal by a whole number	MA 6.1.3.a Multiply and divide positive rational numbers MA 6.1.3.b Select and apply the appropriate method of computation when problem solving (e.g., models, mental computation, paper-pencil, technology, divisibility rules)	MA 7.1.3.a Compute accurately with integers MA 7.1.3.b Select, apply, and explain the method of computation when problem solving using integers and positive rational numbers (e.g., models, mental computation, paper-pencil, technology, divisibility rules) MA 7.1.3.c Solve problems involving percent of numbers (e.g., percent of, % increase, % decrease)	MA 8.1.3.a Compute accurately with rational numbers MA 8.1.3.b Evaluate expressions involving absolute value of integers MA 8.1.3.c Calculate squares of integers, the square roots of perfect squares, and the square roots of whole numbers using technology MA 8.1.3.d Select, apply, and explain the method of computation when problem solving using rational numbers (e.g., models, mental computation, paper-pencil, technology, divisibility rules) MA 8.1.3.e Solve problems involving ratios and proportions (e.g., $\frac{x}{5} = \frac{10}{17}$)	MA 12.1.3.a Compute accurately with real numbers MA 12.1.3.b Simplify exponential expressions (e.g., powers of -1, 0, ½, $3^2 * 3^2 = 3^4$) MA 12.1.3.c Multiply and divide numbers using scientific notation MA 12.1.3.d Select, apply, and explain the method of computation when problem solving using real numbers (e.g., models, mental computation, paper-pencil, or technology)

MA K-12.1 Comprehensive NUMBER SENSE Standard:
Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

CONCEPTS	Grade Level Standards				
	KINDERGARTEN	Grade 1	Grade 2	Grade 3	Grade 4
Estimation	**MA 0.1.4 Mastery not expected at this level.**	**MA 1.1.4 Mastery not expected at this level.**	**MA 2.1.4 Students will estimate and check reasonableness of answers using appropriate strategies and tools.**	**MA 3.1.4 Students will estimate and check reasonableness of answers using appropriate strategies and tools.**	**MA 4.1.4 Students will estimate and check reasonableness of answers using appropriate strategies and tools.**
Curricular Indicators			MA 2.1.4.a Estimate the results of two-digit whole number sums and differences and check the reasonableness of such results MA 2.1.4.b Estimate the number of objects in a group	MA 3.1.4.a Estimate the two-digit product of whole number multiplication and check the reasonableness	MA 4.1.4.a Estimate the three-digit product and the two-digit quotient of whole number multiplication and division and check the reasonableness

MA K-12.1 Comprehensive NUMBER SENSE Standard:
Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

CONCEPTS	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Estimation	**MA 5.1.4 Students will estimate and check reasonableness of answers using appropriate strategies and tools.**	**MA 6.1.4 Students will estimate and check reasonableness of answers using appropriate strategies and tools.**	**MA 7.1.4 Students will estimate and check reasonableness of answers using appropriate strategies and tools.**	**MA 8.1.4 Students will estimate and check reasonableness of answers using appropriate strategies and tools.**	**MA 12.1.4 Students will estimate and check reasonableness of answers using appropriate strategies and tools.**
Curricular Indicators	MA 5.1.4.a Estimate the sums and differences of positive rational numbers to check the reasonableness of such results	MA 6.1.4.a Use appropriate estimation methods to check the reasonableness of solutions for problems involving positive rational numbers	MA 7.1.4.a Use estimation methods to check the reasonableness of solutions for problems involving integers and positive rational numbers	MA 8.1.4.a Use estimation methods to check the reasonableness of solutions for problems involving rational numbers	MA 12.1.4.a Use estimation methods to check the reasonableness of real number computations and decide if the problem calls for an approximation or an exact number (e.g., 10 π (pi) is approximately 31.4, square and cube roots) MA 12.1.4.b Distinguish relevant from irrelevant information, identify missing information and either find what is needed or make appropriate estimates

K - 12 Comprehensive GEOMETRIC/MEASUREMENT Standard:
Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concepts	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Characteristics	Students will identify two-dimensional geometric shapes.	Students will identify characteristics of two-dimensional geometric shapes.	Students will describe characteristics of two-dimensional shapes and identify three-dimensional objects.	Students will identify characteristics and describe properties of two-dimensional shapes and three-dimensional objects.	Students will classify two-dimensional shapes and three-dimensional objects.
Coordinate Geometry	Mastery not expected at this level.	Students will identify locations on a number line.	Students will describe direction on a positive number line.	Students will identify distances on a number line.	Students will describe locations using coordinate geometry.
Transformations	Mastery not expected at this level.	Students will identify a line of symmetry.	Students will identify lines of symmetry.	Students will draw all lines of symmetry.	Students will identify simple transformations.
Spatial Modeling	Students will communicate relative positions in space.	Students will communicate relative positions in space and create two-dimensional shapes.	Students will create two-dimensional shapes.	Students will create two-dimensional shapes and three-dimensional objects.	Student will use geometric models to solve problems.
Measurement	Students will measure using nonstandard units and time.	Students will measure using customary units, time, and money.	Students will measure using customary units, time and money.	Students will apply appropriate procedures and tools to determine measurements using customary units and metric units.	Students will apply appropriate procedures and tools to estimate and determine measurement using customary units and metric units.

K - 12 Comprehensive GEOMETRIC/MEASUREMENT Standard:
Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concepts	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Characteristics	Students will describe relationships among two–dimensional shapes and three-dimensional objects.	Students will compare and contrast properties among two-dimensional shapes and among three-dimensional objects.	Students will describe, compare, and contrast characteristics, properties, and relationships of geometric shapes and objects.	Students will describe, compare, and contrast characteristics, properties, and relationships of geometric shapes and objects.	Students will analyze characteristics, properties, and relationships among geometric shapes and objects.
Coordinate Geometry	Students will identify locations using coordinate geometry.	Students will label points using coordinate geometry.	Students will specify locations and describe relationships using coordinate geometry.	Students will specify locations and describe relationships using coordinate geometry.	Student will use coordinate geometry to analyze and describe relationships in the coordinate plane.
Transformations	Students will identify and use simple transformations.	Students will use and describe results of transformations on geometric shapes.	Students will use transformations and symmetry to analyze geometric shapes.	Students will perform transformations and use them to analyze the orientation and size of geometric shapes.	Students will apply and analyze transformations.
Spatial Modeling	Students will create and use geometric models to solve problems.	Students will use visualization of geometric models to solve problems.	Students will use visualization to create geometric models in solving problems.	Students will use visualization, spatial reasoning and geometric modeling to solve problems.	Students will use visualization, spatial reasoning and geometric modeling to solve problems.
Measurement	Students will apply appropriate procedures, tools and formulas to determine measurements using customary units and metric units.	Students will apply appropriate procedures, tools and formulas to determine measurements.	Students will select and apply appropriate procedures, tools and formulas to determine measurements.	Students will select and apply appropriate procedures, tools and formulas to determine measurements.	Students will apply the units, systems, and formulas to solve problems.

MA K-12.2 Comprehensive GEOMETRIC/MEASUREMENT Standard:
Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Characteristics	**MA 0.2.1 Students will identify two-dimensional geometric shapes.**	**MA 1.2.1 Students will identify characteristics of two-dimensional geometric shapes.**	**MA 2.2.1 Students will describe characteristics of two-dimensional shapes and identify three-dimensional objects.**	**MA 3.2.1 Students will identify characteristics and describe properties of two-dimensional shapes and three-dimensional objects.**	**MA 4.2.1 Students will classify two-dimensional shapes and three-dimensional objects.**
Curricular Indicators	MA 0.2.1.a Sort and name two-dimensional shapes (e.g., square, circle, rectangle, triangle)	MA 1.2.1.a Compare two-dimensional shapes (e.g., square, circle, rectangle, triangle) MA 1.2.1.b Describe attributes of two-dimensional shapes (e.g., square, circle, rectangle, triangle)	MA 2.2.1.a Describe attributes of two-dimensional shapes (e.g., trapezoid, parallelogram) MA 2.2.1.b Determine if two shapes are congruent MA 2.2.1.c Compare two-dimensional shapes (e.g., trapezoid, parallelogram) MA 2.2.1.d Identify solid shapes (e.g., triangular prism, rectangular prisms, cones, cylinders, pyramids, spheres)	MA 3.2.1.a Identify the number of sides, angles, and vertices of two-dimensional shapes MA 3.2.1.b Identify congruent two-dimensional figures given multiple two-dimensional shapes MA 3.2.1.c Identify lines, line segments, rays, and angles MA 3.2.1.d Describe attributes of solid shapes (e.g., triangular prism, rectangular prisms, cones, cylinders, pyramids, spheres)	MA 4.2.1.a Identify two- and three-dimensional shapes according to their sides and angle properties MA 4.2.1.b Classify an angle as acute, obtuse, and right MA 4.2.1.c Identify parallel, perpendicular, and intersecting lines MA 4.2.1.d Identify the property of congruency when dealing with plane geometric shapes

MA K-12.2 Comprehensive GEOMETRIC/MEASUREMENT Standard:

Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Characteristics	**MA 5.2.1 Students will describe relationships among two-dimensional shapes and three-dimensional objects.**	**MA 6.2.1 Students will compare and contrast properties among two-dimensional shapes and among three-dimensional objects.**	**MA 7.2.1 Students will describe, compare, and contrast characteristics, properties, and relationships of geometric shapes and objects.**	**MA 8.2.1 Students will describe, compare, and contrast characteristics, properties, and relationships of geometric shapes and objects.**	**MA 12.2.1 Students will analyze characteristics, properties, and relationships among geometric shapes and objects.**
Curricular Indicators	MA 5.2.1.a Identify the number of edges, faces, and vertices of triangular and rectangular prisms MA 5.2.1.b Justify congruence of two-dimensional shapes MA 5.2.1.c Justify the classification of two-dimensional shapes (e.g., triangles by angles and sides) MA 5.2.1.d Identify degrees on a circle (e.g., 45, 90, 180, 270, 360)	MA 6.2.1.a Justify the classification of three dimensional objects	MA 7.2.1.a Identify and describe similarity of two-dimensional shapes using side and angle measurements MA 7.2.1.b Name line, line segment, ray, and angle (e.g., $\overleftrightarrow{AB}, \overrightarrow{PR} < LMN$)	MA 8.2.1.a Identify and describe similarity of three-dimensional objects MA 8.2.1.b Compare and contrast relationships between similar and congruent objects MA 8.2.1.c Identify geometric properties of parallel lines cut by a transversal and related angles (e.g., perpendicular and parallel lines with transversals) and angles (e.g., corresponding, alternate interior, alternate exterior) MA 8.2.1.d Identify pairs of angles (e.g., adjacent, complementary, supplementary, vertical) MA 8.2.1.e Examine the relationships of the	MA 12.2.1.a Identify and explain the necessity of and give examples of definitions and theorems MA 12.2.1.b Analyze properties and relationships among classes of two and three dimensional geometric objects using inductive reasoning and counterexamples MA 12.2.1.c State and prove geometric theorems using deductive reasoning (e.g., parallel lines with transversals, congruent triangles, similar triangles) MA 12.2.1.d Apply geometric properties to solve problems (e.g., parallel lines, line transversals, similar

				interior angles of a triangle (e.g., the sum of the angles is 180 degrees)	triangles, congruent triangles, proportions) MA 12.2.1.e Identify and apply right triangle relationships (e.g., sine, cosine, tangent, special right triangles, converse of Pythagorean Theorem) MA 12.2.1.f Recognize that there are geometries, other than Euclidean geometry, in which the parallel postulate is not true MA12.2.1.g Know the definitions and basic properties of a circle and use them to prove basic theorems and solve problems

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Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Coordinate Geometry	**MA 0.2.2 Mastery not expected at this level.**	**MA 1.2.2 Students will identify locations on a number line.**	**MA 2.2.2 Students will describe direction on a positive number line.**	**MA 3.2.2 Students will identify distances on a number line.**	**MA 4.2.2 Students will describe locations using coordinate geometry.**
Curricular Indicators		MA 1.2.2.a Identify the position of a whole number on a horizontal number line	MA 2.2.2.a Identify numbers using location on a vertical number line MA 2.2.2.b Compare whole numbers using location on a horizontal number line MA 2.2.2.c Identify the direction moved for adding and subtracting using a horizontal number line	MA 3.2.2.a Draw a number line and plot points MA 3.2.2.b Determine the distance between two whole number points on a number line	MA 4.2.2.a Identify the ordered pair of a plotted point in first quadrant by its location (e.g., (2, 3) is a point two right and three up from the origin)

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Concept	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Coordinate Geometry	**MA 5.2.2 Students will identify locations using coordinate geometry.**	**MA 6.2.2 Students will label points using coordinate geometry.**	**MA 7.2.2 Students will specify locations and describe relationships using coordinate geometry.**	**MA 8.2.2 Students will specify locations and describe relationships using coordinate geometry.**	**MA 12.2.2 Student will use coordinate geometry to analyze and describe relationships in the coordinate plane.**
Curricular Indicators	MA 5.2.2.a Plot the location of an ordered pair in the first quadrant	MA 6.2.2.a Identify the ordered pair of a plotted point in the coordinate plane	MA 7.2.2.a Plot the location of an ordered pair in the coordinate plane MA 7.2.2.b Identify the quadrant of a given point in the coordinate plane MA 7.2.2.c Find the distance between points along horizontal and vertical lines of a coordinate plane (e.g., what is the distance between (0, 3) and (0, 9))	MA 8.2.2.a Use coordinate geometry to represent and examine the properties of rectangles and squares using horizontal and vertical segments	MA 12.2.2.a Use coordinate geometry to analyze geometric situations (e.g., parallel lines, perpendicular lines, circle equations) MA 12.2.2.b Apply the midpoint formula MA 12.2.2.c Apply the distance formula MA 12.2.2.d Prove special types of triangles and quadrilaterals (e.g., right triangles, isosceles trapezoid, parallelogram, rectangle, square)

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Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Transformations	**MA 0.2.3 Mastery not expected at this level.**	**MA 1.2.3 Students will identify a line of symmetry.**	**MA 2.2.3 Students will identify lines of symmetry.**	**MA 3.2.3 Students will draw all lines of symmetry.**	**MA 4.2.3 Students will identify simple transformations.**
Curricular Indicators		MA 1.2.3.a Identify one line of symmetry in two-dimensional shapes (e.g., circle, square, rectangle, triangle)	MA 2.2.3.a Identify lines of symmetry in two-dimensional shapes MA 2.2.3.b Draw a line of symmetry in two-dimensional shapes	MA 3.2.3.a Draw all possible lines of symmetry in two-dimensional shapes	MA 4.2.3.a Given two congruent geometric shapes, identify the transformation (e.g., translation, rotation, reflection) applied to an original shape to create a transformed shape

MA K-12.2 Comprehensive GEOMETRIC/MEASUREMENT Standard:
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Concept	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Transformations	**MA 5.2.3 Students will identify and use simple transformations.**	**MA 6.2.3 Students will use and describe results of transformations on geometric shapes.**	**MA 7.2.3 Students will use transformations and symmetry to analyze geometric shapes.**	**MA 8.2.3 Students will perform transformations and use them to analyze the orientation and size of geometric shapes.**	**MA 12.2.3 Students will apply and analyze transformations.**
Curricular Indicators	MA 5.2.3.a Perform one-step transformations on two dimensional shapes (e.g., translation, rotation, reflection, of 90, 180, and 270)	MA 6.2.3.a Perform and describe positions and orientation of shapes under single transformations (translation, rotation, reflection) not on a coordinate plane	MA 7.2.3.a Identify lines of symmetry for a reflection MA 7.2.3.b Perform and describe positions and orientation of shapes under a single transformation (e.g., translation, rotation, reflection) on a coordinate plane	MA 8.2.3.a Identify the similarity of dilated shapes MA 8.2.3.b Perform and describe positions and sizes of shapes under dilations (e.g., scale factor, ratios)	MA 12.2.3.a Explain and justify the effects of simple transformations on the ordered pairs of two-dimensional shapes MA 12.2.3.b Perform and describe multiple transformations

MA K-12.2 Comprehensive GEOMETRIC/MEASUREMENT Standard:

Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Spatial Modeling	**MA 0.2.4 Students will communicate relative positions in space.**	**MA 1.2.4 Students will communicate relative positions in space and create two-dimensional shapes.**	**MA 2.2.4 Students will create two-dimensional shapes.**	**MA 3.2.4 Students will create two-dimensional shapes and three-dimensional objects.**	**MA 4.2.4 Student will use geometric models to solve problems.**
Curricular Indicators	MA 0.2.4.a Demonstrate positional words (e.g., above/below, near/far, over/ under, in/out, down/up, around/through)	MA 1.2.4.a Demonstrate positional words (e.g., left,/right) MA 1.2.4.b Sketch two-dimensional shapes (e.g., square, circle, rectangle, triangle)	MA 2.2.4.a Sketch two-dimensional shapes (e.g., trapezoid, parallelogram)	MA 3.2.4.a Sketch and label lines, rays, line segments, and angles MA 3.2.4.b Build three-dimensional objects (e.g., using clay for rectangular prisms, cone, cylinder)	MA 4.2.4.a Given a geometric model, use it to solve a problem (e.g., what shapes make a cylinder; streets run parallel and perpendicular)

MA K-12.2 Comprehensive GEOMETRIC/MEASUREMENT Standard:
Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Spatial Modeling	**MA 5.2.4 Students will create and use geometric models to solve problems.**	**MA 6.2.4 Students will use visualization of geometric models to solve problems.**	**MA 7.2.4 Students will use visualization to create geometric models in solving problems.**	**MA 8.2.4 Students will use visualization, spatial reasoning, and geometric modeling to solve problems.**	**MA 12.2.4 Students will use visualization, spatial reasoning, and geometric modeling to solve problems.**
Curricular Indicators	MA 5.2.4.a Build or sketch a geometric model to solve a problem MA 5.2.4.b Sketch congruent shapes MA 5.2.4.c Build rectangular prisms using cubes	MA 6.2.4.a Identify two-dimensional drawings of three-dimensional objects	MA 7.2.4.a Identify the shapes that make up the three-dimensional object MA 7.2.4.b Create two-dimensional representations of three-dimensional objects to visualize and solve problems (e.g., perspective drawing of surface area) MA 7.2.4.c Draw angles to given degree	MA 8.2.4.a Draw geometric objects with specified properties (e.g., parallel sides, number of sides, angle measures, number of faces)	MA 12.2.4.a Sketch and draw appropriate representations of geometric objects using ruler, protractor, or technology MA 12.2.4.b Use geometric models to visualize, describe, and solve problems (e.g., find the height of a tree; find the amount of paint needed for a room; scale model)

MA K-12.2 Comprehensive GEOMETRIC/MEASUREMENT Standard:
Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Measurement	**MA 0.2.5 Students will measure using nonstandard units and time.**	**MA 1.2.5 Students will measure using standard units, time, and money.**	**MA 2.2.5 Students will measure using standard units, time and money.**	**MA 3.2.5 Students will apply appropriate procedures and tools to determine measurements using customary and metric units.**	**MA 4.2.5 Students will apply appropriate procedures and tools to estimate and determine measurement using customary and metric units.**
Curricular Indicators	MA 0.2.5.a Identify the name and amount of a penny, nickel, dime, and quarter MA 0.2.5.b Identify time to the hour MA 0.2.5.c Measure using nonstandard units MA 0.2.5.d Compare objects according to length	MA 1.2.5.a Count like coins to $1.00 MA 1.2.5.b Identify time to the half hour MA 1.2.5.c Identify past, present, and future as orientation in time MA 1.2.5.d Select an appropriate tool for the attribute being measured (e.g., clock, calendar, thermometer, scale, ruler) MA 1.2.5.e Measure length using inches MA 1.2.5.f Compare and order objects according to length	MA 2.2.5.a Count mixed coins to $1.00 MA 2.2.5.b Identify time to 5 minute intervals MA 2.2.5.c Identify and use appropriate tools for the attribute being measured (e.g., clock, calendar, thermometer, scale, ruler) MA 2.2.5.d Measure length using feet and yards MA 2.2.5.e Compare and order objects using inches, feet and yards	MA 3.2.5.a Select and use appropriate tools to measure perimeter of simple two-dimensional shapes (e.g., triangle, square, rectangle) MA 3.2.5.b Count mixed coins and bills greater than $1.00 MA 3.2.5.c Identify time of day (e.g., am, pm, noon, midnight) MA 3.2.5.d State multiple ways for the same time using 15 minute intervals (e.g., 2:15, or quarter past 2, 2:45 or a quarter until 3) MA 3.2.5.e Identify the appropriate customary unit for measuring length, weight, and capacity/volume MA 3.2.5.f Measure length to the nearest ½	MA 4.2.5.a Select and use appropriate tools to measure perimeter of polygons MA 4.2.5.b Identify time to the minute on an analog clock MA 4.2.5.c Solve problems involving elapsed time MA 4.2.5.d Identify the appropriate metric unit for measuring length, weight, and capacity/volume (e.g., cm, m, Km; g, Kg; mL, L) MA 4.2.5.e Estimate and measure length using customary (nearest ½ inch) and metric (nearest centimeter) units MA 4.2.5.f Measure weight and temperature using customary units

				inch and centimeter (e.g., requires rounding) MA 3.2.5.g Compare and order objects according to length using centimeters and meters	MA 4.2.5.g Compute simple unit conversions for length within a system of measurement

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Concept	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Measurement	**MA 5.2.5 Students will apply appropriate procedures, tools, and formulas to determine measurements using customary and metric units.**	**MA 6.2.5 Students will apply appropriate procedures, tools, and formulas to determine measurements.**	**MA 7.2.5 Students will select and apply appropriate procedures, tools, and formulas to determine measurements.**	**MA 8.2.5 Students will select and apply appropriate procedures, tools, and formulas to determine measurements.**	**MA 12.2.5 Students will apply the units, systems, and formulas to solve problems.**
Curricular Indicators	MA 5.2.5.a Select and use appropriate tools to measure perimeter and angles MA 5.2.5.b Identify correct unit (customary or metric) to the measurement situation (e.g., distance from home to school; measure length of a room) MA 5.2.5.c Estimate and measure length with customary units to the nearest ¼ inch MA 5.2.5.d Measure capacity/volume with customary units MA 5.2.5.e Measure weight (mass) and temperature using metric units MA 5.2.5.f Determine the area of rectangles and	MA 6.2.5.a Estimate and measure length with customary and metric units to the nearest 1/16 inch and mm MA 6.2.5.b Measure volume/capacity using the metric system MA 6.2.5.c Convert length, weight (mass), and liquid capacity from one unit to another within	MA 7.2.5.a Measure angles to the nearest degree	MA 8.2.5.a Use strategies to find the perimeter and area of complex shapes	MA 12.2.5.a Use strategies to find surface area and volume of complex objects MA 12.2.5.b Apply appropriate units and scales to solve problems involving measurement MA 12.2.5.c Convert between various units of area and volume, such as square feet to square yards

	squares	the same system MA 6.2.5.d Determine the perimeter of polygons MA 6.2.5.e Determine the area of parallelograms and triangles MA 6.2.5.f Determine the volume of rectangular prisms	MA 7.2.5.b Determine the area of trapezoids and circles, and the circumference of circles MA 7.2.5.c Recognize the inverse relationship between the size of a unit and the number of units used when measuring	MA 8.2.5.b Determine surface area and volume of three-dimensional objects (e.g., rectangular prisms, cylinders) MA 8.2.5.c Apply the Pythagorean theorem to find missing lengths in right triangles and to solve problems MA 8.2.5.d Use scale factors to find missing lengths in similar shapes MA 8.2.5.e Convert between metric and standard units of measurement, given conversion factors (e.g., meters to yards)	MA 12.2.5.d Convert equivalent rates (e.g., feet/second to miles/hour) MA 12.2.5.e Find arc length and area of sectors of a circle MA 12.2.5.f Determine surface area and volume of three-dimensional objects (e.g., spheres, cones, pyramids) MA12.2.5.g Know that the effect of a scale factor k on length, area and volume is to multiply each by k, k^2 and k^3, respectively

K- 12 Comprehensive ALGEBRAIC Standard:
Students will communicate algebraic concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concepts	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Relationships	Students will sort, classify, and order objects by relationships.	Students will identify and describe relationships.	Students will identify, describe, and extend relationships.	Students will represent relationships.	Students will represent and analyze relationships.
Modeling in Context	Students will use objects as models to represent mathematical situations.	Students will use objects and pictures as models to represent mathematical situations.	Students will use objects, pictures and symbols as models to represent mathematical situations.	Students will create and use models to represent mathematical situations.	Students will create and use models to represent mathematical situations.
Procedures	Students will use concrete and verbal representations to solve number stories.	Students will use concrete, verbal, and visual representations to solve number sentences.	Students will use concrete, verbal, visual, and symbolic representations to solve number sentences.	Students will identify and apply properties of whole numbers to solve equations involving addition and subtraction.	Students will identify and apply properties of whole numbers to solve equations involving multiplication and division.

K- 12 Comprehensive ALGEBRAIC Standard:

Students will communicate algebraic concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concepts	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Relationships	Students will represent, analyze, and generalize relationships.	Students will represent, analyze, and use relationships to make generalizations.	Students will represent and analyze relationships using algebraic symbols.	Students will represent and analyze relationships using algebraic symbols.	Students will generalize, represent, and analyze relationships using algebraic symbols.
Modeling in Context	Students will create, use, and compare models representing mathematical situations.	Students will create, use, and interpret models of quantitative relationships.	Students will create, use, and interpret models of quantitative relationships.	Students will create, use, and interpret models of quantitative relationships.	Students will model and analyze quantitative relationships.
Procedures	Students will apply properties of simple positive rational numbers to solve one-step equations.	Students will apply properties to solve equations.	Students will apply properties to solve equations and inequalities.	Students will apply properties to solve equations and inequalities.	Students will represent and solve equations and inequalities.

NON LINEAR FUNCTIONS INCLUDE: QUADRATIC, ABSOLUTE VALUE, SQUARE ROOT, EXPONENTIAL

MA K-12.3 Comprehensive ALGEBRAIC Standard:
Students will communicate algebraic concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Relationships	**MA 0.3.1 Students will sort, classify, and order objects by relationships.**	**MA 1.3.1 Students will identify and describe relationships.**	**MA 2.3.1 Students will identify, describe, and extend relationships.**	**MA 3.3.1 Students will represent relationships.**	**MA 4.3.1 Students will represent and analyze relationships.**
Curricular Indicators	MA 0.3.1.a Sort by color, shape, or size MA 0.3.1.b Create own rule for sorting other than color, shape, and size	MA 1.3.1.a Sort or order objects by their attributes (e.g., color, shape, size, number) then identify the classifying attribute MA 1.3.1.b Create multiple rules for sorting beyond color, shape, and size MA 1.3.1.c Identify, describe, and extend patterns (e.g., patterns with a repeating core) MA 1.3.1.d Use <, =, > to compare quantities	MA 2.3.1.a Create and describe patterns using concrete and pictorial representations	MA 3.3.1.a Identify, describe, and extend numeric and non-numeric patterns MA 3.3.1.b Identify patterns using words, tables, and graphs	MA 4.3.1.a Describe, extend, and apply rules about numeric patterns MA 4.3.1.b Represent and analyze a variety of patterns using words, tables, and graphs MA 4.3.1.c Use ≥, ≤ symbols to compare quantities MA 4.3.1.d Select appropriate operational and relational symbols to make a number sentence true

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Concept	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Relationships	**MA 5.3.1 Students will represent, analyze, and generalize relationships.**	**MA 6.3.1 Students will represent, analyze, and use relationships to make generalizations.**	**MA 7.3.1 Students will represent and analyze relationships using algebraic symbols.**	**MA 8.3.1 Students will represent and analyze relationships using algebraic symbols.**	**MA 12.3.1 Students will generalize, represent, and analyze relationships using algebraic symbols.**
Curricular Indicators	MA 5.3.1.a Describe, extend, apply rules, and make generalizations about numeric, and geometric patterns MA 5.3.1.b Create and analyze numeric patterns using words, tables, and graphs MA 5.3.1.c Communicate relationships using expressions and equations	MA 6.3.1.a Describe and create simple algebraic expressions (e.g., one operation, one variable) from words and tables MA 6.3.1.b Use a variable to describe a situation with an equation (e.g., one-step, one variable) MA 6.3.1.c Identify relationships as increasing, decreasing, or constant	MA 7.3.1.a Describe and create algebraic expressions from words, tables, and graphs MA 7.3.1.b Use a variable to describe a situation with an inequality (e.g., one-step, one variable) MA 7.3.1.c Recognize and generate equivalent forms of simple algebraic expressions	MA 8.3.1.a Represent and analyze a variety of patterns with tables, graphs, words, and algebraic equations MA 8.3.1.b Describe relationships using algebraic expressions, equations, and inequalities (e.g., two-step, one variable) MA 8.3.1.c Identify constant slope from tables and graphs	MA 12.3.1.a Represent, interpret, and analyze functions with graphs, tables, and algebraic notation and convert among these representations (e.g., linear, non-linear) MA 12.3.1.b Identify domain and range of functions represented in either symbolic or graphical form (e.g., linear, non-linear) MA 12.3.1.c Identify the slope and intercepts of a linear relationship from an equation or graph MA 12.3.1.d Identify characteristics of linear and non-linear functions MA 12.3.1.e Graph linear and non-linear functions MA 12.3.1.f Compare and analyze the rate of change by using ordered

					pairs, tables, graphs, and equations MA 12.3.1.g Graph and interpret linear inequalities MA 12.3.1.h Represent, interpret, and analyze functions and their inverses MA 12.3.1.i Determine if a relation is a function

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Students will communicate algebraic concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Modeling in Context	**MA 0.3.2 Students will use objects as models to represent mathematical situations.**	**MA 1.3.2 Students will use objects and pictures as models to represent mathematical situations.**	**MA 2.3.2 Students will use objects, pictures, and symbols as models to represent mathematical situations.**	**MA 3.3.2 Students will create and use models to represent mathematical situations.**	**MA 4.3.2 Students will create and use models to represent mathematical situations.**
Curricular Indicators	MA 0.3.2.a Model situations that involve the addition and subtraction of whole numbers 0 – 10 using objects	MA 1.3.2.a Model situations that involve the addition and subtraction of whole numbers 0 – 20, using objects and pictures MA 1.3.2.b Describe and model quantitative change (e.g., a student growing taller)	MA 2.3.2.a Model situations that involve the addition and subtraction of whole numbers 0 – 100, using objects and number lines MA 2.3.2.b Describe and model quantitative change involving addition (e.g., a student grew 2 inches)	MA 3.3.2.a Model situations that involve the addition and subtraction of whole numbers using objects, number lines, and symbols MA 3.3.2.b Describe and model quantitative change involving subtraction (e.g., temperature dropped two degrees)	MA 4.3.2.a Model situations that involve the multiplication of whole numbers using number lines and symbols MA 4.3.2.b Describe and model quantitative change involving multiplication (e.g., money doubling)

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Students will communicate algebraic concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Modeling in Context	**MA 5.3.2 Students will create, use, and compare models representing mathematical situations.**	**MA 6.3.2 Students will create, use, and interpret models of quantitative relationships.**	**MA 7.3.2 Students will create, use, and interpret models of quantitative relationships.**	**MA 8.3.2 Students will create, use, and interpret models of quantitative relationships.**	**MA 12.3.2 Students will model and analyze quantitative relationships.**
Curricular Indicators	MA 5.3.2.a Model situations that involve the addition, subtraction, and multiplication of positive rational numbers using words, graphs, and tables MA 5.3.2.b Represent a variety of quantitative relationships using tables and graphs MA 5.3.2.c Compare different models to represent mathematical situations	MA 6.3.2.a Model contextualized problems using various representations (e.g., graphs, tables) MA 6.3.2.b Represent a variety of quantitative relationships using symbols and words	MA 7.3.2.a Model contextualized problems using various representations (e.g., one-step/variable expressions, one-step/variable equations) MA 7.3.2.b Represent a variety of quantitative relationships using algebraic expressions and one-step equations	MA 8.3.2.a Model contextualized problems using various representations (e.g., two-step/one variable equations) MA 8.3.2.b Represent a variety of quantitative relationships using algebraic expressions and two-step/one variable equations	MA 12.3.2.a Model contextualized problems using various representations (e.g., graphs, tables, one variable equalities, one variable inequalities, linear equations in slope intercept form, inequalities in slope intercept form, system of linear equations with two variables) MA 12.3.2.b Represent a variety of quantitative relationships using linear equations and one variable inequalities MA 12.3.2.c Analyze situations to determine the type of algebraic relationship (e.g., linear, nonlinear) MA 12.3.2.d Model contextualized problems using various representations for non-linear functions (e.g.,

					quadratic, exponential, square root, and absolute value)

CONTEXTUALIZED PROBLEM – A MATHEMATICAL SITUATION PLACED IN A PARTICULAR CONTEXT (E.G., USING WORDS, DIAGRAMS, TABLES, DRAWINGS, ETC.)

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Concept	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Procedures	**MA 0.3.3 Students will use concrete and verbal representations to solve number stories.**	**MA 1.3.3 Students will use concrete, verbal, and visual representations to solve number sentences.**	**MA 2.3.3 Students will use concrete, verbal, visual, and symbolic representations to solve number sentences.**	**MA 3.3.3 Students will identify and apply properties of whole numbers to solve equations involving addition and subtraction.**	**MA 4.3.3 Students will identify and apply properties of whole numbers to solve equations involving multiplication and division.**
Curricular Indicators	MA 0.3.3.a Use objects to solve addition and subtraction of whole numbers 0 – 10	MA 1.3.3.a Write number sentences to represent fact families MA 1.3.3.b Use concrete, pictorial, and verbal representations of the commutative property of addition	MA 2.3.3.a Use symbolic representations of the commutative property of addition (e.g., 2 + 3 = Δ + 2)	MA 3.3.3.a Use symbolic representation of the identity property of addition (e.g., 3 = 0 + 3) MA 3.3.3.b Solve simple one-step whole number equations involving addition and subtraction (e.g., Δ + 2 = 3) MA 3.3.3.c Explain the procedure(s) used in solving simple one-step whole number equations involving addition and subtraction	MA 4.3.3.a Represent the idea of a variable as an unknown quantity using a letter or a symbol (e.g., n + 3, b – 2) MA 4.3.3.b Use symbolic representation of the identity property of multiplication (e.g., 5 * 1 = 5) MA 4.3.3.c Use symbolic representations of the commutative property of multiplication (e.g., 2 * 3 = Δ * 2) MA 4.3.3.d Solve simple one-step whole number equations (e.g., x + 2 = 3, 3 * y = 6) MA 4.3.3.e Explain the procedure(s) used in solving simple one-step whole number equations

MA K-12.3 Comprehensive ALGEBRAIC Standard:
Students will communicate algebraic concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High School**
Procedures	**MA 5.3.3 Students will apply properties of simple positive rational numbers to solve one-step equations.**	**MA 6.3.3 Students will apply properties to solve equations.**	**MA 7.3.3 Students will apply properties to solve equations and inequalities.**	**MA 8.3.3 Students will apply properties to solve equations and inequalities.**	**MA 12.3.3 Students will represent and solve equations and inequalities.**
Curricular Indicators	MA 5.3.3.a Explain the addition property of equality (e.g., if a = b, then a + c = b + c) MA 5.3.3.b Use symbolic representations of the associative property (e.g., (2 + 3) + 4 = 2 + (3 + n), (2 * 3) * 4 = 2 * (3 * n)) MA 5.3.3.c Evaluate numerical expressions by using parentheses with respect to order of operations (e.g., 6 + (3 * 5)) MA 5.3.3.d Evaluate simple algebraic expressions involving addition and subtraction MA 5.3.3.e Solve one-step addition and subtraction equations involving common positive rational numbers	MA 6.3.3.a Explain the multiplication property of equality (e.g., if a = b, then ac = bc) MA 6.3.3.b Evaluate numerical expressions containing multiple operations with respect to order of operations (e.g., 2 + 4 x 5) MA 6.3.3.c Evaluate simple algebraic expressions involving multiplication and division MA 6.3.3.d Solve one-step equations involving positive rational numbers MA 6.3.3.e Identify and explain the properties of equality used in solving one-step equations (e.g., addition, subtraction, division)	MA 7.3.3.a Explain additive inverse of addition (e.g., 7 + -7 = 0) MA 7.3.3.b Use symbolic representation of the distributive property (e.g., 2(x + 3) = 2x + 6) MA 7.3.3.c Given the value of the variable(s), evaluate algebraic expressions with respect to order of operations MA 7.3.3.d Solve two-step equations involving integers and positive rational numbers MA 7.3.3.e Solve one-step inequalities involving positive rational numbers MA 7.3.3.f Identify and explain the properties used in solving two-step equations (e.g., addition,	MA 8.3.3.a Explain the multiplicative inverse (e.g., 4 * ¼= 1) MA 8.3.3.b Evaluate numerical expressions containing whole number exponents (e.g., if x = 4, then $(x + 3)^2 + 5x = ?$) MA 8.3.3.c Solve multi-step equations involving rational numbers MA 8.3.3.d Solve two-step inequalities involving rational numbers MA 8.3.3.e Identify and explain the properties used in solving two-step inequalities and multi-	MA 12.3.3.a Explain/apply the reflexive, symmetric, and transitive properties of equality MA 12.3.3.b Simplify algebraic expressions involving exponents (e.g., $(3x^4)^2$) MA 12.3.3.c Add and subtract polynomials MA 12.3.3.d Multiply and divide polynomials (e.g., divide $x^3 - 8$ by $x - 2$, divide $x^4 - 5x^3 - 2x$ by x^2) MA 12.3.3.e Factor polynomials MA 12.3.3.f Identify and generate equivalent forms of linear equations MA 12.3.3.g Solve linear equations and inequalities including

	MA 5.3.3.f Identify and explain the properties of equality used in solving one-step equations involving common positive rational numbers		subtraction, multiplication and division)	step equations	absolute value MA 12.3.3.h Identify and explain the properties used in solving equations and inequalities MA 12.3.3.i Solve quadratic equations (e.g., factoring, graphing, quadratic formula) MA 12.3.3.j Add, subtract, and simplify rational expressions MA 12.3.3.k Multiply, divide, and simplify rational expressions MA 12.3.3.l Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified values of their variables MA 12.3.3.m Derive and use the formulas for the general term and summation of finite arithmetic and geometric series MA 12.3.3.n Combine functions by composition, as well as by addition, subtraction, multiplication, and division MA 12.3.3.o Solve an equation involving

					several variables for one variable in terms of the others MA 12.3.3.p Analyze and solve systems of two linear equations in two variables algebraically and graphically

K- 12 Comprehensive DATA ANALYSIS/PROBABILITY Standard:
Students will communicate data analysis/probability concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concepts	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Display and Analysis	Students will sort, classify, represent, describe, and compare sets of objects.	Students will sort, classify, organize, describe, and compare data.	Students will organize, display, compare, and interpret data.	Students will organize, display, compare, and interpret data.	Students will organize, display, compare, and interpret data.
Predictions and Inferences	Mastery not expected at this level.	Mastery not expected at this level.	Mastery not expected at this level.	Mastery not expected at this level.	Students will construct predictions based on data.
Probability	Mastery not expected at this level.	Mastery not expected at this level.	Mastery not expected at this level.	Students will find and describe experimental probability.	Students will find, describe, and compare experimental probabilities.

K - 12 Comprehensive DATA ANALYSIS/PROBABILITY Standard:
Students will communicate data analysis/probability concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concepts	Grade Level Standards				
	Grade 5	Grade 6	Grade 7	Grade 8	High School
Display and Analysis	Students will organize, display, compare, and interpret data.	Students will organize, display, compare, and interpret data.	Students will formulate questions that can be addressed with data and then organize, display, and analyze the relevant data to answer their questions.	Students will formulate questions that can be addressed with data, and then organize, display, and analyze the relevant data to answer their questions.	Students will formulate a question and design a survey or an experiment in which data is collected and displayed in a variety of formats, then select and use appropriate statistical methods to analyze the data.
Predictions and Inferences	Students will construct predictions based on data.	Students will construct predictions based on data.	Students will evaluate predictions and make inferences based on data.	Students will evaluate predictions and make inferences based on data.	Students will develop and evaluate inferences to make predictions.
Probability	Students will determine theoretical probabilities.	Students will apply basic concepts of probability.	Students will apply and interpret basic concepts of probability.	Students will apply and interpret basic concepts of probability.	Students will apply and analyze concepts of probability.

MA K-12.4 Comprehensive DATA ANALYSIS/PROBABILITY Standard:
Students will communicate data analysis/probability concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Display and Analysis	**MA 0.4.1 Students will sort, classify, represent, describe, and compare sets of objects.**	**MA 1.4.1 Students will sort, classify, organize, describe, and compare data.**	**MA 2.4.1 Students will organize, display, compare, and interpret data.**	**MA 3.4.1 Students will organize, display, compare, and interpret data.**	**MA 4.4.1 Students will organize, display, compare, and interpret data.**
Curricular Indicators	MA 0.4.1.a Sort and classify objects according to an attribute (e.g., size, color, shape) MA 0.4.1.b Identify the attributes of sorted data MA 0.4.1.c Compare the attributes of the data (e.g., most, least, same)	MA 1.4.1.a Sort and classify objects by more than one attribute MA 1.4.1.b Organize data by using concrete objects MA 1.4.1.c Represent data by using tally marks MA 1.4.1.d Compare and interpret information from displayed data (e.g., more, less, fewer)	MA 2.4.1.a Represent data using pictographs MA 2.4.1.b Interpret data using pictographs (e.g., 7 more; 2 less; 12 all together)	MA 3.4.1.a Represent data using horizontal and vertical bar graphs MA 3.4.1.b Use comparative language to describe the data (e.g., increasing, decreasing) MA 3.4.1.c Interpret data using horizontal and vertical bar graphs	MA 4.4.1.a Represent data using dot/line plots MA 4.4.1.b Compare different representations of the same data MA 4.4.1.c Interpret data and draw conclusions using dot/line plots MA 4.4.1.d Find the mode and range for a set of whole numbers MA 4.4.1.e Find the whole number mean for a set of whole numbers

MA K-12.4 Comprehensive DATA ANALYSIS/PROBABILITY Standard:
Students will communicate data analysis/probability concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High school**
Display and Analysis	**MA 5.4.1 Students will organize, display, compare, and interpret data.**	**MA 6.4.1 Students will organize, display, compare, and interpret data.**	**MA 7.4.1 Students will formulate questions that can be addressed with data and then organize, display, and analyze the relevant data to answer their questions.**	**MA 8.4.1 Students will formulate questions that can be addressed with data, and then organize, display, and analyze the relevant data to answer their questions.**	**MA 12.4.1 Students will formulate a question and design a survey or an experiment in which data is collected and displayed in a variety of formats, then select and use appropriate statistical methods to analyze the data.**
Curricular Indicators	MA 5.4.1.a Represent data using line plots MA 5.4.1.b Represent the same set of data in different formats (e.g., table, pictographs, bar graphs, line plots) MA 5.4.1.c Draw conclusions based on a set of data MA 5.4.1.d Find the mean, median, mode, and range for a set of whole numbers MA 5.4.1.e Generate questions and answers from data sets and their graphical representations	MA 6.4.1.a Represent data using stem and leaf plots, histograms, and frequency charts MA 6.4.1.b Compare and interpret data sets and their graphical representations MA 6.4.1.c Find the mean, median, mode, and range for a set of data MA 6.4.1.d Compare the mean, median, mode, and range from two sets of data	MA 7.4.1.a Analyze data sets and interpret their graphical representations MA 7.4.1.b Find and interpret mean, median, mode, and range for sets of data MA 7.4.1.c Explain the difference between a population and a sample MA 7.4.1.d List biases that may be created by various data collection processes MA 7.4.1.e Formulate a question about a characteristic within one population that can be answered by simulation or a survey	MA 8.4.1.a Represent data using circle graphs and box plots with and without the use of technology MA 8.4.1.b Compare characteristics between sets of data or within a given set of data MA 8.4.1.c Find, interpret, and compare measures of central tendency (mean, median, mode) and the quartiles for sets of data MA 8.4.1.d Select the most appropriate unit of central tendency for sets of data MA 8.4.1.e Identify misrepresentation and misinterpretation of data represented in circle	MA 12.4.1.a Interpret data represented by the normal distribution and formulate conclusions MA 12.4.1.b Compute, identify, and interpret measures of central tendency (mean, median, mode) when provided a graph or data set MA 12.4.1.c Explain how sample size and transformations of data affect measures of central tendency MA 12.4.1.d Describe the shape and determine spread (variance, standard deviation) and outliers of a data set MA 12.4.1.e Explain how statistics are used or misused in the world

				graphs and box plots	MA 12.4.1.f Create scatter plots, analyze patterns, and describe relationships in paired data MA 12.4.1.g Explain the impact of sampling methods, bias, and the phrasing of questions asked during data collection and the conclusions that can rightfully be made MA 12.4.1.h Explain the differences between randomized experiment and observational studies

MA K-12.4 Comprehensive DATA ANALYSIS/PROBABILITY Standard:
Students will communicate data analysis/probability concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
Predictions and Inferences	**MA 0.4.2 Mastery not expected at this level.**	**MA 1.4.2 Mastery not expected at this level.**	**MA 2.4.2 Mastery not expected at this level.**	**MA 3.4.2 Mastery not expected at this level.**	**MA 4.4.2 Students will construct predictions based on data.**
Curricular Indicators					MA 4.4.2.a Make predictions based on data to answer questions from tables and bar graphs

MA K-12.4 Comprehensive DATA ANALYSIS/PROBABILITY Standard:
Students will communicate data analysis/probability concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Grade 5	Grade 6	Grade 7	Grade 8	High school
Predictions and Inferences	**MA 5.4.2 Students will construct predictions based on data.**	**MA 6.4.2 Students will construct predictions based on data.**	**MA 7.4.2 Students will evaluate predictions and make inferences based on data.**	**MA 8.4.2 Students will evaluate predictions and make inferences based on data.**	**MA 12.4.2 Students will develop and evaluate inferences to make predictions.**
Curricular Indicators	MA 5.4.2.a Make predictions based on data to answer questions from tables, bar graphs, and line plots	MA 6.4.2.a Make predictions based on data and create questions to further investigate the quality of the predictions	MA 7.4.2.a Determine if data collected from a sample can be used to make predictions about a population	MA 8.4.2.a Evaluate predictions to formulate new questions and plan new studies MA 8.4.2.b Compare and contrast two sets of data to make inferences	MA 12.4.2.a Compare data sets and evaluate conclusions using graphs and summary statistics MA 12.4.2.b Support inferences with valid arguments MA 12.4.2.c Develop linear equations for linear models to predict unobserved outcomes using regression line and correlation coefficient MA 12.4.2.d Recognize when arguments based on data confuse correlation with causation

MA K-12.4 Comprehensive DATA ANALYSIS/PROBABILITY Standard: Students will communicate data analysis/probability concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.					
Concept	**Grade Level Standards**				
	Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
Probability	**MA 0.4.3 Mastery not expected at this level.**	**MA 1.4.3 Mastery not expected at this level.**	**MA 2.4.3 Mastery not expected at this level.**	**MA 3.4.3 Students will find and describe experimental probability.**	**MA 4.4.3 Students will find, describe, and compare experimental probabilities.**
Curricular Indicators				MA 3.4.3.a Perform simple experiments (e.g., flip a coin, toss a number cube, spin a spinner) and describe outcomes as possible, impossible, or certain	MA 4.4.3.a Perform simple experiments and compare the degree of likelihood (e.g., more likely, equally likely, or less likely)

MA K-12.4 Comprehensive DATA ANALYSIS/PROBABILITY Standard:
Students will communicate data analysis/probability concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Concept	Grade Level Standards				
	Grade 5	**Grade 6**	**Grade 7**	**Grade 8**	**High school**
Probability	**MA 5.4.3 Students will determine theoretical probabilities.**	**MA 6.4.3 Students will apply basic concepts of probability.**	**MA 7.4.3 Students will apply and interpret basic concepts of probability.**	**MA 8.4.3 Students will apply and interpret basic concepts of probability.**	**MA 12.4.3 Students will apply and analyze concepts of probability.**
Curricular Indicators	MA 5.4.3.a Perform and record results of probability experiments MA 5.4.3.b Generate a list of possible outcomes for a simple event MA 5.4.3.c Explain that the likelihood of an event that can be represented by a number from 0 (impossible) to 1 (certain)	MA 6.4.3.a Describe the theoretical probability of an event using a fraction, percentage, decimal, or ratio MA 6.4.3.b Compute theoretical probabilities for independent events MA 6.4.3.c Find experimental probability for independent events	MA 7.4.3.a Find the probability of independent compound events (e.g., tree diagram, organized list) MA 7.4.3.b Compare and contrast theoretical and experimental probabilities	MA 8.4.3.a Identify complementary events and calculate their probabilities MA 8.4.3.b Compute probabilities for independent compound events	MA 12.4.3.a Construct a sample space and a probability distribution MA 12.4.3.b Identify dependent and independent events and calculate their probabilities MA 12.4.3.c Use the appropriate counting techniques to determine the probability of an event (e.g. ,combinations, permutations) MA 12.4.3.d Analyze events to determine if they are mutually exclusive MA 12.4.3.e Determine the relative frequency of a specified outcome of an event to estimate the probability of the outcome