

MA 12.1 Students will communicate number sense concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Grade 12

Algebra 1, Geometry

MA 12.1.1 NUMBER SYSTEM: Students will represent and show relationships among real numbers.

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
MA 12.1.1 a	Demonstrate multiple equivalent forms of irrational numbers. (e.g., $\sqrt{8}=8^{1/2}=2\sqrt{2}$.)	multiple equivalent forms irrational numbers	show simplify demonstrate	<i>Numbers can be expressed in many forms</i> <i>Knowledge of irrational numbers</i> <i>How can we express irrational numbers in different forms?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	65,66 6.6	Numeration LEARNS
MA 12.1.1 b	Compare, contrast and apply the properties of numbers and the real number system, including rational, irrational, imaginary, and complex numbers.	properties of #'s properties of rational, irrational, imaginary, complex, and real numbers real number system	compare contrast apply	<i>Knowledge of the real and complex number systems.</i> <i>Relate differences in number systems</i> <i>Use the properties of our number system</i> <i>How are the real and complex number systems different?</i> <i>How are the properties of our # systems important?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	1,39,97; 64,65,66	Numeration LEARNS

MA 12.1.2 OPERATIONS: Students will demonstrate the meaning and effects of arithmetic operations with real numbers.

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
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? $\sqrt{1/4} = 1/2$.)	words symbols multiplication division powers(positive) positive roots effects of operations	explain of operations use drawings, words and symbols	<i>The effects of operations on the magnitude of quantities</i> <i>Why is it important to know the effects of operations?</i> <i>How do operations affect the magnitude of quantities?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	A, 3-5; 1,6-9; 17-19;65;10-12 CORD 13	Numeration LEARNS
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.	drawings words symbols distance number line absolute value	simplify explain use	<i>Explain the connection between distance and absolute value of numbers on a number line</i> <i>Why is it important to know the connection between distance of two numbers and absolute value?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	3,109 1.2,7.1,7.6	Numeration LEARNS, Geometry LEARNS

MA 12.1.3 COMPUTATION: Students will compute fluently and accurately using appropriate strategies and tools.

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
REGIONAL PRIORITY MA 12.1.3a TESTED DOK level 1	Compute accurately with real numbers.	real numbers	compute accurately	<i>manipulate real numbers How do we compute real numbers?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	A, 3-5;1, 6-9, 10-12 CORD 13 p.20-26	NeSA Computation LEARNS, Computation STARS
MA 12.1.3b TESTED DOK level 1,2	Simplify exponential expressions (e.g., powers of 1, 0, 1/2, $3^2 \cdot 3^2 = 3^4$.)	exponential expressions	simplify	<i>Simplify exponential expressions How do we simplify exponential expressions? Why simplify exponential expressions?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	17-19, 65	NeSA Computation LEARNS, Computation STARS
MA 12.1.3c	Multiply and divide numbers using scientific notation.	scientific notation	multiply divide	<i>multiply and divide numbers in scientific notation how are numbers in scientific notation multiplied and divided?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	77,83,107	Numeration LEARNS, Computation LEARNS
REGIONAL PRIORITY MA 12.1.3d	Select, apply and explain the method of computation when problem solving using real numbers (e.g. models, mental computation, paper-pencil, technology.)	method of computation problem solving using real numbers	select apply explain	<i>decide method of computation for solving problems How are methods of computation decided for solving problems?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	49,52,62; 96,99,104; B,2; C,61; B,10 CORD 13 p.20-26	Computation LEARNS

MA 12.1.4 ESTIMATION: Students will estimate and check the reasonableness of answers by using appropriate strategies and tools.

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
REGIONAL PRIORITY MA 12.1.4a TESTED DOK level 2	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., 10π (pi) is approximately 31.4, square and cube roots.)	estimation methods reasonableness real number computations approximation exact #	estimate check decide	<i>Use estimation to see if an answer seems correct Determine if an approximation or exact answer is needed Why use estimation to see if an answer is correct? Why use approximations or exact answers?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	106; 66 CORD 13 p 3-20	NeSA Computation LEARNS
REGIONAL PRIORITY MA 12.1.4b	Distinguish relevant from irrelevant information, identify missing information and either find what is needed or make appropriate estimates.	relevant information irrelevant info missing info appropriate estimates	distinguish identify find make	<i>Determine the pertinent information to the problem Determine if information is missing How do we estimate the value, given the information in the question? Why don't we need that piece of information to solve the problem?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	49,52,62;96,99,104; B,2; C,61; B,10 8.3; labs in general	Computation LEARNS, Computation STARS

MA 12.2 Students will communicate geometric concepts and measurement concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines

Grade 12

MA 12.2.1 CHARACTERISTICS: Students will analyze characteristics, properties, and relationships among geometric shapes and objects.

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
MA 12.2.1a	Identify and explain the necessity of and give examples of definitions and theorems.	definitions theorems examples	identify explain give	<i>Understand definitions and theorems in geometry How do students apply a theorem to a hands-on problem?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	Glossary p 732-738; Formauls, Postulates, Theorems p 739-744	Geometry LEARNS
MA 12.2.1b	Analyze properties and relationships among classes of two and three dimensional geometric objects using inductive reasoning and counterexamples.	two and three dimensional objects inductive reasoning counter examples properties and relationships of classes	analyze use	<i>Determine attributes of two and three dimensional objects Apply inductive reasoning and counter examples to identify relationships of 2 and 3 dimensional objects How do 2 and 3 dimensional figures relate?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	10.3, 5.3-5.5, 2.1	Geometry LEARNS
MA 12.2.1c	State and prove geometric theorems using deductive reasoning (e.g., parallel lines with transversals, congruent triangles, similar triangles.)	geometric theorems deductive reasoning	state prove deductive reasoning	<i>use deductive reasoning to state and prove geometric theorems How is deductive reasoning used to state and prove geometric theorems?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	2.2; 1.5, 3.1-3.4, Lab 3.1, Lab 7.2; 6.2 6.5; 4.1-4.3	Geometry LEARNS
REGIONAL PRIORITY MA 12.2.1d TESTED DOK level 2	Apply geometric properties to solve problems (e.g., parallel lines, line transversals, similar triangles, congruent triangles, proportions.)	geometric properties problems	apply solve	<i>use geometric properties to solve problems How are geometric properties used to solve problems?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	1.5, 3.1-3.4, Lab 3.1, Lab 7.2; 6.2-6.5; 4.1-4.3	NeSA Geometry STARS
REGIONAL PRIORITY MA 12.2.1e TESTED DOK level 2	Identify and apply right triangle relationships (e.g., sine, cosine, tangent, special right triangles, converse of Pythagorean Theorem.)	right triangle relationships sine, cosine, tangent special right triangles Pythagorean theorem	identify apply find solve	<i>Determine which rt triangle relationship to use to find a missing value. Use rt triangle relationships to find missing values How do we determine which rt triangle relationship to use? How do we use relationships to find missing values?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	6.7, 6.8,6.9	NeSA Geometry LEARNS
MA 12.2.1f	Recognize that there are geometries other than Euclidean geometry, in which the parallel postulate is not true.	geometries Euclidean geometry parallel postulate	recognize	<i>Understand that there are other types of geometry where parallel postulate is not true. How and why is the parallel postulate not true?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	3.4	Geometry LEARNS

MA 12.2.1g	Know the definitions and basic properties of a circle and use them to prove basic theorems and solve problems.	definitions basic properties of a circle basic theorems problems	know use prove solve	<i>Know definitions and properties of circles</i> <i>Use definitions and properties to prove theorems of circles.</i> <i>Solve problems of circles using definitions and theorems.</i> <i>Why are definitions and properties of circles important in proving and solving problems?</i>	knowledge		B 8.5,8.7,9.1, Lab 9.1	Geometry LEARNS
					comprehen	1 recall		
					application	2 skills		
					analysis	3 strategic		
					synthesis	4 extended		
					eval			

MA 12.2.2 COORDINATE GEOMETRY: Students will use coordinate geometry to analyze and describe relationships in the coordinate plane.

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
REGIONAL PRIORITY MA 12.2.2a TESTED DOK level 2	Use coordinate geometry to analyze geometric situations (e.g., parallel lines, perpendicular lines, circle equations.)	coordinate geometry parallel perpendicular circle equations	analyze	<i>using coordinate geometry in a useful manner</i> <i>Why does a coordinate plane help with an understanding of lines, figures, and measurements?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	54, 85, 115, 119 3.1; 1.5, Lab 2.3, Lab 7.2, 3.1; 9.1, Lab 9.1	NeSA Geometry LEARNS
MA 12.2.2b	Apply the midpoint formula.	midpoint formula	apply	<i>Students use the midpoint formula.</i> <i>How could the midpoint formula be used to find a location?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	1.2, 7.1	Geometry LEARNS
REGIONAL PRIORITY MA 12.2.2c TESTED DOK level 2	Apply the distance formula.	distance formula	apply	<i>Students use the distance formula to find length of segments.</i> <i>How can the distance formula be used to find length?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	102 1.2, 7.1, 7.6	NeSA Geometry LEARNS
REGIONAL PRIORITY MA 12.2.2d TESTED DOK level 2,3	Prove special types of triangles and quadrilaterals (e.g., right triangles, isosceles, trapezoid, parallelogram, rectangle, square.)	special types triangles special types quadrilaterals	prove	<i>Use coordinate geometry to prove special types of triangles and quadrilaterals</i> <i>How is coordinate geometry used to prove special types of triangles and quadrilaterals?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	4.4, 6.7; 5.3-5.4	NeSA Geometry LEARNS, Geometry STARS

MA 12.2.3 TRANSFORMATIONS: Students will apply and analyze transformations.

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
MA 12.2.3a	Explain and justify the effects of simple transformations on the ordered pairs of two-dimensional shapes.	simple transformations ordered pairs effects two-dimensional shapes	explain justify	<i>Students understand simple transformation</i> <i>Students understand the effects of transformation on a figure</i> <i>How do transformations affect 2-dimensional shapes?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	11.1-11.3	Geometry LEARNS

MA 12.2.3b	Perform and describe multiple transformations.	transformation	perform describe analyze	How do transformations in sequence result in a final figure. What transformations are necessary to go from an initial figure to a final figure? What transformations are available?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	11.4	Geometry LEARNS
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MA. 12.2.4 SPATIAL MODELING: Students will use visualization, spatial reasoning, and geometric modeling to solve problems.

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
MA 12.2.4.a	Sketch and draw appropriate representations of geometric objects using ruler, protractor or technology.	appropriate representations geometric objects ruler protractor technology	sketch draw use	Sketch and draw geometric shapes Use a ruler, protractor or technology to draw or sketch How do we sketch and draw geometric shapes? How do we use a ruler, protractor, or technology?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	1.6, Lab 1.2, Lab 1.3, 3.3, Lab 4.2, Mobile Unit	Constructions, Mobile Unit
REGIONAL PRIORITY MA 12.2.4.b TESTED DOK level 2	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.)	geometric models problems	use visualize describe solve	Geometric models are used in a variety of ways to solve problems How are geometric models used to solve a variety of problems?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	5.6, 6.4, 6.5; 10.1-10.9; 6.1, 6.7, 8.6, 11.7	NeSA Geometry LEARNS, Mobile Unit

MA 12.2.5 MEASUREMENT: Students will apply the units, systems and formulas to solve problems.

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
MA 12.2.5a	Use strategies to find the surface area and volume of complex objects.	strategies surface area volume complex objects	use find	Students determine surface area and volume of complex objects. How can we find the surface area and volume of a complex object?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	C, 2, 61 10.1-10.9	Geometry STARS
MA 12.2.5b	Apply appropriate units and scales to solve problems involving measurement.	appropriate units scales problems measurement	apply solve	Appropriate units and scales used to solve measurement problems. How are appropriate units and scales used to solve measurement problems?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 13 p. 3-20	Measurement LEARNS
MA 12.2.5c	Convert between various units of area and volume, such as square feet to square yards.	area volume square units	conversion	How do we use specific units to obtain a more desirable or useful unit? How does one unit become equivalent to another?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	1,8	Measurement LEARNS

REGIONAL PRIORITY MA 12.2.5d TESTED DOK level 2	Convert equivalent rates (e.g., feet/second to miles/hour.)	equivalent rates units	convert rewrite	Convert equivalent rates How do you convert equivalent rates?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	1,8, formal extension by instructor	NeSA Measurement LEARNS
MA 12.2.5e	Find arc length and areas of a sector of a circle.	arc lengths area sectors circle	find	Students find arc length in a circle Students determine sector area of a circle How can we find the arc length of a circle? How can we find the sector area of a circle?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	8.7,9.3	Geometry LEARNS
MA 12.2.5f	Determine surface area and volume of three-dimensional objects (e.g., spheres, cones, pyramids.)	surface area volume 3D objects	determine	Calculate surface area and volume of 3D objects How are surface area and volume formulas used in 3D figures?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	61 10.1-10.8	Geometry STARS
MA 12.2.5g	Know the effect of a scale factor k on length, area, and volume is to multiply each by k, k ² and k ³ , respectively.	scale factor length area volume	know multiply square cube	Know the effects of a scale factor on length, area and volume. How does a scale factor affect length, area and volume?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	6.1, 6.7, 8.6, 10.8	Geometry LEARNS

MA 12.3 Students will communicate algebraic concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Grade 12

MA 12.3.1 RELATIONSHIPS: Students will generalize, represent and analyze relationships using algebraic symbols. Non linear functions include: quadratic, absolute value, square root, expotential.

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
REGIONAL PRIORITY MA 12.3.1a TESTED DOK level 2,3	Represent, interpret and analyze functions with graphs, tables, and algebraic notation and convert among these representations (e.g., linear, non-linear.)	function linear non-linear	analyze interpret	Know what a funciton is. Know how to manipulate functions. How do we identify a function and perform operations on them?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	113, 114	NeSA Algebra LEARNS
MA 12.3.1b	Identify domain and range of functions represented in either symbolic or graphical form (e.g., linear, non-linear.)	domain range funcitons symbolic form graphical form	identify represent	Identify domain and range of functions in graph or symbol form. How is the foman and range identified from funcitons?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	67, 113	Algebra LEARNS

REGIONAL PRIORITY MA 12.3.1c TESTED DOK level 1,2	Identify the slope and intercepts of a linear relationship from an equation or graph.	slope intercepts linear relationship equation graph	identify represent	Tell the slope and intercepts of a line from an equation or graph. How will a student determine the slope and intercepts of a line from an equation or graph?	knowledge comprehen application analysis synthesis eval	85, 112 7.4	NeSA Geometry LEARNS, Algebra LEARNS
REGIONAL PRIORITY MA 12.3.1d TESTED DOK level 2,3	Identify characteristics of linear and non-linear functions.	characteristics linear non-linear functions	identify represent	Students can differentiate between linear and non-linear functions. How do we determine if a function is linear? How do we determine if a function is non-linear?	knowledge comprehen application analysis synthesis eval	54, 85, 112 7.1, 7.3, 7.4	NeSA Algebra LEARNS
MA 12.3.1e	Graph linear and non-linear functions.	linear functions non-linear funcitons	graph	Graph linear and non-linear funcitons How are linear and non-linear functions graphed?	knowledge comprehen application analysis synthesis eval	54, 85, 112 7.4	Geometry LEARNS, Algebra LEARNS
REGIONAL PRIORITY MA 12.3.1f TESTED DOK level 2,3	Compare and analyze the rate of change by using ordered pairs, tables, graphs, and equations.	rate of change ordered pairs tables raphs equations	compare analyze use	Compare rates of change with different methods. Analyze rates of change. How does a rate of change differ in moving from one point to another on the graph?	knowledge comprehen application analysis synthesis eval	85 7.2	NeSA Geometry LEARNS, Algebra LEARNS
MA 12.3.1g	Graph and interpret linear inequalities.	linear linear inequality	graph interpret	How linear inequalities relate to real-life situations. How do linear inequalities relate to a coordinate plane? How do we use non-linear inequalities?	knowledge comprehen application analysis synthesis eval	125	Geometry LEARNS, Algebra LEARNS
MA 12.3.1h	Represent, interpret and analyze functions and their inverses.	functions inverses	represent interpret analyze	Draw and investigate functions and their inverses. Why are functions and their inverses important?	knowledge comprehen application analysis synthesis eval	113, 114	Algebra LEARNS
MA 12.3.1i	Determine if a relation is a function.	relation function	determine	Decide whether a relation is a function. How do you tell whether a relation is a function or not?	knowledge comprehen application analysis synthesis eval	113	Algebra LEARNS

MA 12.3.2 MODELING IN CONTEXT: Students will model and analyze quantitative relationships. (Contextualized problem--a mathematical situation placed in a particular context (e.g., using words, diagrams, tables, drawings.)

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
MA 12.3.2a	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, systems of linear equations with two variables.)	contextualized problems representations	model	<i>Students will understand story problems. How are various representations used to solve story problems?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	49, 52, 62; 96, 99, 104; 54, 85 5.2	Algebra STARS
MA 12.3.2b TESTED DOK level 3	Represent a variety of quantitative relationships using linear equations and one variable inequalities.	quantitative linear variable inequality	represent compare	<i>Use inequalities in different situations. Use linear equations in different situations. How are linear equations used to express situations? How are one variable inequalities used to express situations?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	96, 99, 104 2.7	NeSA Algebra STARS
MA 12.3.2c	Analyze situations to determine the type of algebraic relationship (e.g., linear, non-linear.)	situations type algebraic relationships linear non-linear	analyze determine	<i>Know the difference between different types of algebraic relationships. Why do you need to know the difference between linear and non-linear relationships?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	54, 85	Algebra LEARNS, Algebra STARS
MA 12.3.2d	Model contextualized problems using various representations for non-linear functions (e.g., quadratic, exponential, square root, and absolute value.)	contextualized problems representations non-linear functions	model use	<i>Use words, diagrams, tables and drawings for non-linear functions. How are various representations used to model non-linear functions?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	3, 109; 101 6.6, 6.7	Algebra LEARNS, Algebra STARS

MA 12.3.3 PROCEDURES: Students will represent and solve equations and inequalities.

	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
MA 12.3.3a	Explain/apply the reflexive, symmetric, and transitive properties of equality.	reflexive property symmetric property transitive property	explain apply	<i>Explain and apply properties of equality to solve equations and inequalities. Why are properties of equality important in solving equations and inequalities?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	2.6	Geometry LEARNS
REGIONAL PRIORITY MA 12.3.3b TESTED DOK level 1	Simplify algebraic expressions involving exponents (e.g., $(3x^4)^2$.)	algebraic expressions exponents	simplify	<i>Solve problems with exponents. How do we simplify problems with exponents?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	27, 36, 40, 41, 84	NeSA Computation STARS

REGIONAL PRIORITY MA 12.3.3c TESTED DOK level 1	Add and subtract polynomials.	polynomials	add subtract	<i>manipulation of polynomials , add and subtract. How are polynomials added and subtracted?</i>	knowledge comprehen application analysis synthesis eval	16 1 recall 2 skills 3 strategic 4 extended	NeSA Algebra STARS
REGIONAL PRIORITY MA 12.3.3d TESTED DOK level 1	Multiply and divide polynomials (e.g., divide x^3-8 by $x-2$, divide x^4-5x^3-2x by x^2 .)	polynomials: monomials, binomials, trinomials multiply divide long division	compute multiply divide	<i>Multiply and divide polynomials How do we multiply and divide polynomials?</i>	knowledge comprehen application analysis synthesis eval	15, 51; 35, 88 1 recall 2 skills 3 strategic 4 extended	NeSA Algebra STARS
MA 12.3.3e	Factor polynomials.	polynomilas	factor	<i>Factoring of polynomials How are polynomials factored?</i>	knowledge comprehen application analysis synthesis eval	34, 73, 74, 128 1 recall 2 skills 3 strategic 4 extended	Algebra STARS
REGIONAL PRIORITY MA 12.3.3f TESTED DOK level 1	Identify and generate equivalent forms of linear equations.	equivalent forms linear equaitons	identify generate	<i>Recognize and find equivalent forms of linear equations. How are equivalent forms of linear equations found?</i>	knowledge comprehen application analysis synthesis eval	112 7.4 1 recall 2 skills 3 strategic 4 extended	NeSA Algebra STARS
MA 12.3.3g	Solve linear equations and inequalities including absolute value.	linear equations inequalities absolute value	solve	<i>Solve linear equation problems. Solve inequalities. How do we solve for a variable in a linear equation? How do we solve for a set of values in an inequality?</i>	knowledge comprehen application analysis synthesis eval	3, 109 2.6 1 recall 2 skills 3 strategic 4 extended	Algebra STARS
MA 12.3.3h	Identify and explain the properties used in solving equations and inequalities.	properties equations inequalities	identify explain solving	<i>Know the properties used to solve equations. Kow the properties used to solve inequalites How are properties used to solve equaitons? How are properties used to solve inequalities?</i>	knowledge comprehen application analysis synthesis eval	21-24, 30, 43 2.6 1 recall 2 skills 3 strategic 4 extended	Algebra STARS
MA 12.3.3i	Solve quadratic equations (e.g., factoring, graphing, quadratic formula.)	quadratic equations factoring quadratic formula	solve factor graph	<i>Solve quadratic equations. How do you solve quadratic equations?</i>	knowledge comprehen application analysis synthesis eval	73, 91, 131 1 recall 2 skills 3 strategic 4 extended	Algebra STARS
MA 12.3.3j	Add, subtract, and simplify rational expressions.	rational expressions	add subtract simplify	<i>Perform operatios with rational expressions. How are rational expressions simplified?</i>	knowledge comprehen application analysis synthesis eval	35, 47, 56 1 recall 2 skills 3 strategic 4 extended	Algebra STARS

MA 12.3.3k	Multiply and divide and simplify rational expressions.	rational expressions	manipulate	Apply arithmetic applications to rational expressions. How do we manipulate algebraic , rational expressions?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	35, 36, 47, 98	Algebra STARS
MA 12.3.3l	Evaluate polynomials and rational expressions containing radicals and absolute values at specified values of their variables.	polynomial rational expressions radicals absolute values variables	evaluate	Evaluate expressions given values for variables. How are expressions evaluated?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	13	Algebra LEARNS, Algebra STARS
MA 12.3.3m	Derive and use the formulas for the general term and summation of finite arithmetic and geometric series.	formula general term summation finite arithmetic geometric series	derive use	Find any term in a series. Derive a formula to fin any term in a series. How do you find a term in a series?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	5.1, 5.2	Algebra LEARNS
MA 12.3.3n	Combine functions by composition, as well as by addition, subtraction, multiplication and division.	functions composition addition subtraction multiplication division	combine	Putting together functions with basic operations. How are basic operations used to put functions together?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	114	Algebra LEARNS
MA 12.3.3o	Solve an equation involving several variables for one variable in terms of the others.	equation variable terms	solve	Solve an equation with several variables for a specific variable. How is a multi-variable equation solved for a specific variable?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	60, 111	Algebra LEARNS
MA 12.3.3p	Analyze and solve systems of two linear equations in two variables algebraically and graphically.	linear equaitons variable	analyze solve	Solving linear equaitons with 2 equations and 2 variables. How do you solve systems of equations in two variables?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	58, 71, 84	Algebra LEARNS

MA 12.4 Students will communicate data analysis/probability concepts using multiple representations to reason, solve problems, and make connections within mathematics and across disciplines.

Grade 12

MA 12.4.1 DISPLAY AND ANALYSIS: 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 that data.								
	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
MA 12.4.1a	Interpret data represented by the normal distribution and formulate conclusions.	data normal distribution conclusions	interpret formulate	<i>Make conclusions about data in a normal distribution How are conclusions about normal distributions developed?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 19 p 20-26; Exercise 10	Data/Statistics LEARNS
MA 12.4.1b	Compute, identify and interpret measures of central tendency (mean, median, mode) when provided a graph or data set.	measures of central tendency: mean, median, mode, graph, data set	compute, identify, interpret, provided	<i>find the mean, median and mode of a data set. Why do so? How do you find the mean, median and mode of a data set?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 19 p 7-17, p 26-30	Data/Statistics LEARNS
MA 12.4.1c	Explain how a sample size and transformations of data affect measures of central tendency.	sample size, transformations of data, measures of central tendency	explain, tell	<i>Show the effect of sample size and transformations on measures of central tendency. How do sample size and transformations affect measures of central tendency?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 19 p 7-17; Exercise 28	Data/Statistics LEARNS
REGIONAL PRIORITY MA 12.4.1d TESTED DOK level 2	Describe the shape and determine spread (variance, standard deviation) and outliers of a data set.	shape, spread, variance, standard deviations, outliers, data set	describe, determine	<i>Find the outliers of a data set. Describe the shape of a data set. Determine the spread of a data set. How do you find the outliers of a data set? How do you find the shape of a data set? How do we determine the spread of a data set?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 19 p18-30; Exercise 10	NeSA Data/Statistics LEARNS
MA 12.4.1e	Explain how statistics are used or misused in the world.	statistics world	explain, use, misused	<i>Explain how statistics are relevant in the real-world. Why are statistics used/misused in the real-world?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 19 p 3-6; Exercises 2, 4, 10, 12, 28. CORD 20 p 23-24.	Data/Statistics STARS
MA 12.4.1f	Create scatter plots, analyze patterns, and describe relationships in paired data.	scatter plot, paired data	graphing, plotting	<i>Plotting points using paired data. recognizing patterns in scatter plots. How do scatter plots represent patterns of behavior?</i>	Knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	53 CORD 19 Lab 19.1	Data/Statistics STARS

MA 12.4.1g	Explain the impact of sampling methods, bias, and the phrasing of questions asked during data collection and the conclusions that can rightfully be made.	impact sampling methods, bias, phrase questions data collection, conclusions	explain, ask, madesk	Explain factors used during data collection that are used to make conclusions. Why are different factors used in data collection and how do they affect conclusions?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 19 p3-6 and teacher formal introduction.	Data/Statistics LEARNS
MA 12.4.1h	Explain the differences between randomized experiment and observational studies.	random data observational studies	recognition	Differences in randomized and experimental observations. How do randomized experiments differ from observations?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 19 p3-6 and teacher formal introduction. Exercis 2, 4.	Data/Statistics STARS

MA 12.4.2 PREDICTIONS AND INFERENCES: Students will develop and evaluate inferences to make predictions.

	INDICATORS	CONCEPTS Students will know = nouns	SKILLS Students will do = verbs	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	ASSESSMENT core, common
MA 12.4.2a	Compare data sets and evaluate conclusions using graphs and summary statistics.	data set, graphical statistics, summary statistics	compare, evaluate	comparison of data sets using graphs. How do data sets differ? Why use graphs to compare data sets?	Knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	2.1	Data/Statistics LEARNS
MA 12.4.2b	Support inferences with valid arguments.	inferences valid argumentsn	support	Support an hypothesis with a valid argument. How do we support a hypothesis with a valid argument?	Knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	2.2-2.4	Data/Statistics LEARNS
MA 12.4.2c	Develop linear equations for linear models to predict unobserved outcomes using regression line and correlation coefficient.	linear equaitons linear modles unobserved outcomes regression line correlation coefficient	develop, predict, use	Use regression line and correlation coefficient to develop linear equaitons from model and outcomes. How are regression lines and correlation coefficients used to develop linear equations?	Knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	7.4	Data/Statistics LEARNS
MA 12.4.2d	Recognize when arguments based on data confuse correlation with causation.	arguments, data, correlation, causaiton	recognize, confuse	Comparing causation and correlation. How are causation and correlation related?	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	2.4-2.6	Data/Statistics STARS

MA 12.4.3 PROBABILITY: Students will apply and analyze concepts of probability.								ASSESSMENT core, common
	INDICATORS	CONCEPTS <i>Students will know = nouns</i>	SKILLS <i>Students will do = verbs</i>	ESSENTIAL QUESTIONS and BIG IDEAS	BLOOMS taxonomy	WEBBS Depth of Knowledge	CURRICULUM ALIGNMENT:	
MA 12.4.3a	Construct a sample space and a probability distribution.	sample space, probability, distribution	construct	Construct sample space. Construct probability distribution. <i>How are sample space and probability distributions put together?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 20 p 7-15; 8.7	Data/Statistics LEARNS
REGIONAL PRIORITY MA 12.4.3b TESTED DOK level 1,2	Identify dependent and independent events and calculate their probabilities.	dependent event independent event probabilities	identify calculate	Identify dependent and independent events. Calculate probabilities. <i>How are probabilities calculated for events?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	132 CORD 20 p 19-21; 8.7	NeSA Data/Statistics LEARNS
REGIONAL PRIORITY MA 12.4.3c TESTED DOK level 1,2	Use the appropriate counting techniques to determine the probability of an event (e.g., combinations, permutations.)	counting techniques probability event combinations permutaitons	use determien	find the probability of an event. <i>How do you find the probability of an event?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 20 p 7-24	NeSA Data/Statistics LEARNS
REGIONAL PRIORITY MA 12.4.3d TESTED DOK level 2	Analyze events to determine if they are mutually exclusive.	mutually exclusive events	analyze determine	Decide if events are mutually exclusive. <i>How do you decide if events are mutually exclusive?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 20 p 18-19	NeSA Data/Statistics LEARNS
MA 12.4.3e	Determine the relative frequency of a specified outcome of an event to estimate the probability of the outcome.	relative frequency probability specified outcome	determine estimate	use concepts of probability and relative frequency. <i>How do we use outcomes to estimate probability?</i>	knowledge comprehen application analysis synthesis eval	1 recall 2 skills 3 strategic 4 extended	CORD 20 p 4-7; 8.7	Data/Statistics LEARNS

The curriculum alignment locates an initial opportunity to explore and/or learn a standard in Algebra 1 and/or Geometry. Continuing opportunities for skill continuation, mastery and enhancement are not given. Algebra 1 and Geometry are required for graduation.

Algebra 1 text: Algebra 1 second edition, Saxon Publishers 1990 (6th printing 1995), **red in curriculum alignment, listed by lesson number**

Geometry text: Geometry Mathematics in Context second edition, CORD Communications 2004; **green in curriculum alignment, listed by Chapter.Section**

auxiliary workbook: CORD units 13,19,20 CORD Communications 1989; **green in curriculum alignment, listed by Unit, pages and/or Lab**

Depth of Knowledge is highlighted according to the NeSA Math Test Table of Specifications from the NE Dept of Ed website.

The standards are assessed at the district level with appropriate unit tests in Algebra 1 and Geometry. The Learns and Stars test are given and used for evaluation.

(updated: January 2012, B. Engebretsen)