Grade 3 Mathematics MCA-III Achievement Level Descriptors

Number and Operation

399

366

Meets State Standard

Exceeds the Standard   Solves real-world and mathematical problems using addition, subtraction, and multiplication; understands that the size of a fractional part is relative to the size of the whole.

366

Meets the Standard   Compares and represents whole numbers up to 100,000; solves real-world and mathematical problems using addition and subtraction; represents multiplication and division in various ways (reference MN Academic Standards 3.1.2.3); compares and orders fractions with common denominators.

350

Does Not Meet State Standard

Partially Meets the Standard   Represents whole numbers up to 1,000 using expanded notations; compares whole numbers up to 100,000; subtracts multi-digit whole numbers without regrouping; knows common multiplication and division facts (2s, 5s, 10s); writes fractions for a given representation, including number line.

340

Does Not Meet the Standard   Represents whole numbers with words; adds multi-digit whole numbers, matches fractions with correct area model.

301

Algebra

399

366

Meets State Standard

Exceeds the Standard   Conceptual understanding of pattern (e.g., recognizes input-output relationship); interprets number sentences involving unknowns.

366

Meets the Standard   Continues patterns to a specified term (e.g., given first three terms in a pattern, finds sixth term); represents real-world situations with a number sentence involving basic facts and an unknown.

350

Does Not Meet State Standard

Partially Meets the Standard   Identifies next number in a pattern; represents simple situations with a number sentence involving basic facts and an isolated unknown.

340

Does Not Meet the Standard   Recognizes additive patterns in lists of numbers; recognizes basic facts represented in number sentences

301

Geometry & Measurement

399

366

Meets State Standard

Exceeds the Standard   Distinguishes between parallel and perpendicular lines in a shape; conceptual understanding of perimeter; determines elapsed time and does not require a graphic.

366

Meets the Standard   Identifies parallel and perpendicular lines; calculates perimeter; makes correct change from a dollar; tells time from an analog clock; determines elapsed time within an hour; solves problems involving reading a thermometer and calculating temperature.

350

Does Not Meet State Standard

Partially Meets the Standard   Names and describes polygons based on a familiar pictorial orientation by counting number of sides; determines perimeter using additive model.

340

Does Not Meet the Standard   Recognizes parallel lines; matches a picture to the name of a familiar polygon (pattern blocks); knows to use a ruler to measure distance; knows the value of coins; reads a thermometer.

301

Data Analysis & Probability

399

366

Meets State Standard

Exceeds the Standard   Translates between data and data displays in a variety of situations.

366

Meets the Standard   Interprets bar graphs, pictographs, and tally charts.

350

Does Not Meet State Standard

Partially Meets the Standard   Matches set of data with data display (e.g., table or graph).

340

Does Not Meet the Standard   Reads data from a bar graph.

301

Grade 4 Mathematics MCA-III Achievement Level Descriptors

Number and Operation

499

466

Meets State Standard

Exceeds the Standard Chooses correct operation in a problem solving situation; uses various strategies to solve multi-step problems and assess the reasonableness of results; develops a rule for addition and subtraction of fractions with common denominators; compares and orders decimals to the thousandths.

450

Meets the Standard Knows division facts; multiplies multi-digit numbers; solves multiplication problems when all relevant information is present and the question is clearly defined; solves division problems by solving for missing factor; connects relationship between multiplication and division; solves multi-step problems involving addition and subtraction; uses fraction models to determine equivalent fractions; reads and writes decimals up to thousandths.

Does Not Meet State Standard

Partially Meets the Standard Knows basic multiplication facts and recognizes some division facts; knows decimal and fraction equivalents for halves and fourths; uses models to compute with fractions.

440

Does Not Meet the Standard : Partial recall of basic multiplication facts; computes inefficiently (e.g., uses repeated addition instead of multiplication); uses models to represent fractions.

401

Algebra

499

466

Meets State Standard

Exceeds the Standard Uses multi-step rules for patterns presented in different formats; translates between real-world situations and number sentences.

450

Meets the Standard Uses a verbal rule for input-output table; recognizes an algebraic rule for a one-operation pattern; represents real-world situations with a number sentence involving an unknown.

Does Not Meet State Standard

Partially Meets the Standard Uses a verbal rule to continue pattern; matches number sentences with an isolated unknown in situations involving only multiplication.

440

Does Not Meet the Standard Recognizes patterns in lists of numbers.

401

Geometry & Measurement

499

466

Meets State Standard

Exceeds the Standard Names and classifies polygons in a variety of contexts and orientations; conceptual understanding that polygons can be described using sides AND/OR angles; calculates area by decomposing shapes into rectangles; applies transformations to shapes; conceptual understanding of congruency (reference MN Academic Standards 4.3.3.4).

450

Meets the Standard Names and describes triangles and common quadrilaterals using definitions; classifies angles in a variety of orientations; conceptual understanding of area as length times width; identifies a transformation (reference MN Academic Standards 4.3.3).

Does Not Meet State Standard

Partially Meets the Standard Names and describes polygons based on a familiar pictorial orientation using solely one attribute; identifies lines of symmetry; recognizes congruent shapes with the same orientation; calculates perimeter when all sides of a graphic are labeled.

440

Does Not Meet the Standard Names familiar polygons (e.g., pattern blocks); classifies angles in a familiar orientation (e.g., one ray is horizontal).

401

Data Analysis & Probability

499

466

Meets State Standard

Exceeds the Standard Conceptual understanding of solving problems involving data displays, including timelines and Venn diagrams

450

Meets the Standard Collects, organizes, and displays data; solves problems in data displays involving fractions.

Does Not Meet State Standard

Partially Meets the Standard Translates between tables and bar graphs.

440

Does Not Meet the Standard Displays data from a table in a bar graph

401

Grade 5 Mathematics MCA-III Achievement Level Descriptors

Number and Operation

599	
	Exceeds the Standard Efficiently divides and knows when to divide in a problem solving situation; adds and subtracts fluently with fractions and decimals.
563	
	Meets the Standard Divides multi-digit numbers; solves division problems when all relevant information is present and the question is clearly defined; orders and compares common fractions and decimals; adds and subtracts fractions; adds and subtracts decimals.
550	
	Partially Meets the Standard Knows basic division facts; knows benchmark decimal and fraction equivalents (e.g., ½ = 0.5, ¼ = 0.25).
540	
	Does Not Meet the Standard Partial mastery of basic division facts; recognizes fractions and decimals in familiar context.
501	

Meets State Standard / Does Not Meet State Standard

Algebra

599	
	Exceeds the Standard Works fluently with patterns and/or rules involving more than one operation or complex problem; applies the commutative, associate and distributive properties; interprets inequalities using variables.
563	
	Meets the Standard Uses rules to generate patterns; translates between patterns and rules; applies commutative and associative properties; understands simple inequalities; represents a situation with an equation containing a variable.
550	
	Partially Meets the Standard Recognizes patterns in a list of numbers; resorts to calculation to verify commutative and associative properties; solves verbal and simple one-step equations and inequalities by substituting a value for the unknown.
540	
	Does Not Meet the Standard Recognizes patterns that use skip counting; works with simple variable representations.
501	

Meets State Standard / Does Not Meet State Standard

Geometry & Measurement

599	
	Exceeds the Standard Understands the connections between two- and three-dimensional representations; conceptual understanding of area, surface area, and volume.
563	
	Meets the Standard Classifies three-dimensional figures and describes distinct attributes using correct vocabulary; uses formulas to calculate area, surface area, and volume; decomposes familiar shapes.
550	
	Partially Meets the Standard Recognizes similar attributes of three-dimensional figures; limited vocabulary for attributes of three-dimensional figures; recognizes area as a multiplicative model (e.g., multiplies two sides of any shape to find area).
540	
	Does Not Meet the Standard Distinguishes between two- and three-dimensional shapes; uses informal naming conventions.
501	

Meets State Standard / Does Not Meet State Standard

Data Analysis & Probability

599	
	Exceeds the Standard Conceptual understanding of mean, median and range; analyzes complex situations that include data displays and making interpretations.
563	
	Meets the Standard Calculates mean, median and range, and data can be provided in a variety of formats (e.g., tables, bar graphs); works fluently with data displays and solving problems.
550	
	Partially Meets the Standard Applies rote procedures for calculating mean, median and range (e.g., median is always middle number in a list); interprets simple displays of data to solve problems.
540	
	Does Not Meet the Standard Performs procedures for finding mean, median and range according to direct instructions; reads displays of data.
501	

Meets State Standard / Does Not Meet State Standard

Grade 6 Mathematics MCA-III Achievement Level Descriptors

Number and Operation

Meets State Standard

699
662

Exceeds the Standard   Recognizes when it is appropriate to apply the concept of factoring; sees connection between factoring and application in a problem solving situation; efficiently translates between fraction, decimal, and percent forms of positive rational number to solve problems; compares ratios and understands their relationship to fractions; recognizes ratios in context.

662
650

Meets the Standard   Understands the concept of factors and factoring (composing and decomposing numbers); determines equivalences among fractions, decimals, and percents but reverts to one representation to solve problems (e.g., changes everything to decimals); creates ratio to represent situation when given key words in context; understands concept of ratio.

Does Not Meet State Standard

650
640

Partially Meets the Standard   Names pairs of factors of numbers (e.g., 12 = 2 x 6, 12 = 3 x 4); recognizes equivalences among common fractions, decimals, and percents; recognizes a ratio (only) in numeric form; solves unit rate problems in a straight-forward context (division).

640
601

Does Not Meet the Standard   Can only name common pairs of factors of a given number (e.g., 12 = 3 x 4); uses decimals to separate numbers (e.g., ¾ = 3.4); sees decimal in money context only; solves ratio or rate problems as multiplication and division problems.

Algebra

Meets State Standard

699
662

Exceeds the Standard   Interprets equations and inequalities with multiple unknowns; understands that solving for a variable is not always the answer to the question.

662
650

Meets the Standard   Represents relationships between varying quantities using equations and inequalities, involving variables, graphs, and verbal descriptions; uses the properties of arithmetic as well as order of operations to generate equivalent expressions and to solve problems.

Does Not Meet State Standard

650
640

Partially Meets the Standard   Solves one-step problems in straightforward situations; uses computational facts, instead of equality, to find solutions; recognizes patterns (e.g., multiplicative and additive patterns); recognizes relationships between varying quantities represented in tables, graphs, or verbal descriptions.

640
601

Does Not Meet the Standard   Understands concept of variable as a place holder for an answer; recognizes patterns (additive) within lists of numbers; occasionally solves one-step problems in very familiar situations (money); can find missing whole number based on number facts, not algebraic properties.

Geometry & Measurement

Meets State Standard

699
662

Exceeds the Standard   Determines area and perimeter of irregular shapes; determines surface area; understands and uses relationships between angles in geometric figures; converts among units of measure within a measurement system.

662
650

Meets the Standard   Recognizes and applies formulas for two- and three-dimensional figures; determines area and perimeter of irregular shapes when key is one-square unit; recognizes vocabulary associated with angles; knows basic conversions among units within a measurement system (e.g., feet to inches, centimeters to meters).

Does Not Meet State Standard

650
640

Partially Meets the Standard   Calculates area and volume for basic figures (rectangles) when dimensions are provided; determines area and perimeter of irregular shapes by counting; calculates surface area when a net is provided; converts between feet and inches, hours and minutes.

640
601

Does Not Meet the Standard   When determining area and perimeter of irregular shapes, counts by whole numbers (part is whole, diagonal is always one unit); associates 180 degrees with a triangle and 90 degrees with a right angle; finds one missing angle if given the other two in a triangle; given a problem requiring unit conversion, will multiply or divide.

Data Analysis & Probability

Meets State Standard

699
662

Exceeds the Standard   Represents probabilities in real-world problems, including determining sample space in a variety of ways; understands concept of probability; solves problems involving compound probability.

662
650

Meets the Standard   Determines sample space; understands simple probability in fractions, decimals, and percents.

Does Not Meet State Standard

650
640

Partially Meets the Standard   Determines sample space (i.e., the set of all possible outcomes) in a simple and very familiar context; understands simple probability expressed in fractional form.

640
601

Does Not Meet the Standard   Determines probability as a fraction when sample space is given.

Grade 7 Mathematics MCA-III Achievement Level Descriptors

Number and Operation

799

760

Meets State Standard

Exceeds the Standard Conceptual understanding of rational numbers including justification of why a number is rational; solves non-routine (complex) problems/situations using rational numbers.

Meets the Standard Recognizes rational numbers in various forms and converts between forms; compares positive and negative rational numbers; solves multi-step problems involving rational numbers in routine problems/situations including proportions; understands that absolute value is the distance from zero.

750

740

Does Not Meet State Standard

Partially Meets the Standard Changes numbers in fractional form to decimal form and uses to compare; recognizes common repeating decimals and perfect squares under 100 as rational; solves multi-step problems involving familiar rational numbers when all relevant information is present and the question is clearly defined.

Does Not Meet the Standard Changes numbers in fractional form to decimal form by dividing; recognizes that short terminating decimals, fractions, and whole numbers are rational; recognizes familiar numbers as rational; recognizes that a negative numbers is less than a positive number; solves one-step problems with integers; uses a set of defined steps to find a missing number in a given proportion.

701

Algebra

799

760

Meets State Standard

Exceeds the Standard Distinguishes proportional relationships from other relationships; understands the concept of proportionality and applies it to non-routine problem solving situations; uses the properties as well as order of operations to generate equivalent algebraic expressions and solve non-routine problems; represents and solves equations involving non-routine representations

Meets the Standard Understands the concept of proportionality and applies to routine problem solving situations; uses properties of algebra as well as order of operations to generate equivalent algebraic expressions and solve problems; represents and solves equations involving one variable, symbolically.

750

740

Does Not Meet State Standard

Partially Meets the Standard Matches a proportion to a given problem situation; writes algebraic expressions using the commutative and associative properties; solves equations numerically (by substitution).

Does Not Meet the Standard Represents simple context as a graph; relies on key words to determine operations to represent relationships; solves one-step equations in explicit situations following rote procedure, instead of the concept of equality.

701

Geometry & Measurement

799

760

Meets State Standard

Exceeds the Standard Justifies formulas for surface area and volume; can see relationships between circles and cylinders; solves problems involving scale factor and area ratios (with or without a diagram); uses algebraic rules to describe multiple translations or reflections on a grid.

Meets the Standard Uses formulas to calculate area and circumference of circles and volume and surface area of cylinders; uses proportions and ratios to solve problems involving scale drawings and conversions; uses verbal descriptions to perform translations or reflections on a grid.

750

740

Does Not Meet State Standard

Partially Meets the Standard Uses formulas for area and circumference of a circle and volume of a cylinder when exact values to substitute are given; solves problems with similar figures when a diagram is provided with corresponding parts labeled with "friendly" numbers; uses verbal description to perform a single translation or reflection on a grid.

Does Not Meet the Standard Calculates the circumference of a circle when given the diameter; recognizes a translation or a reflection on a coordinate grid.

701

Data Analysis & Probability

799

760

Meets State Standard

Exceeds the Standard Efficiently determines mean, median and range regardless of presentation; understands abstractly how change in data set impacts mean and median (quantity of change without recalculating); interprets circle graphs and histograms to solve problems; uses proportions to calculate probabilities and solve non-routine problems.

Meets the Standard Calculates mean, median and range from various data displays; understands impact of change in data set (increase or decrease); reads circle graphs and histograms to solve problems; calculates probability as a fraction of sample space.

750

740

Does Not Meet State Standard

Partially Meets the Standard Calculates mean, median and range from a string of numbers (knows to order data set to determine median – or does not have to write down the ordered data set); reads circle graphs to solve problems; determines the sample space for an experiment using inefficient procedures; understands simple probability in fractions, decimals, and percents.

Does Not Meet the Standard Calculates mean, median and range from a string of numbers using rote procedures (numbers must be in increasing order to calculate median); matches a given data set to the graph of the data; determines sample space (i.e., the set of all possible outcomes) in a simple and very familiar context; understands simple probability expressed in fractional form.

701

Grade 8 Mathematics MCA-III Achievement Level Descriptors

Number and Operation

899	
	Exceeds the Standard Conceptual understanding of real numbers.
861	
850	**Meets the Standard** Recognizes real numbers in various forms; compares real numbers; generates equivalent expressions involving rational numbers in routine problems/situations, including scientific notation.
840	**Partially Meets the Standard** Recognizes familiar rational and irrational numbers.
801	**Does Not Meet the Standard** Recognizes fractions and terminating decimals as rational numbers.

Meets State Standard / *Does Not Meet State Standard*

Algebra

899	
	Exceeds the Standard Conceptual understanding of dependent and independent variables; solves equations and inequalities and interprets solutions; represents non-routine linear situations with tables, verbal descriptions, symbols, equations, and graphs; converts between forms of a linear equation (i.e., standard, point-slope, slope-intercept); knows names of algebraic properties for justification in evaluating algebraic expressions; represents systems of linear equations provided a verbal description; solves a linear system algebraically and graphically and expresses the solution as an ordered pair.
861	
850	**Meets the Standard** Recognizes a linear function in symbolic and graphic presentations; represents familiar and routine linear situations with tables, verbal descriptions, symbols, equations, and graphs and translates from one representation to another; identifies graphical properties of linear functions; generates and evaluates equivalent algebraic expressions; identifies systems of linear equations when provided a verbal description; identifies the solution of a linear system as the intersection of the two lines when given the graph; solves equations and inequalities using algebraic properties.
840	**Partially Meets the Standard** Recognizes familiar linear functions in symbolic (using key variables) and graphic presentations; translates linear representations from an equation in slope-intercept form to a graph; identifies y-intercept and slope from graphical representation or an equation written in slope-intercept form; evaluates routine algebraic expressions; solves equations with variables using substitution.
801	**Does Not Meet the Standard** Recognizes linear functions in graphic presentations; translates linear representations from a table to a graph; identifies slope by counting whole number units on a graph; identifies patterns in a table of a linear function (e.g., recognizes patterns for x or y-values but not the relationship between x and y); substitutes "easy" numbers and evaluates simple expressions.

Meets State Standard / *Does Not Meet State Standard*

Geometry & Measurement

899	
	Exceeds the Standard Conceptual understanding of the Pythagorean Theorem and applies it in non-routine problems; understands and applies slopes of parallel and perpendicular lines graphically and symbolically.
861	
850	**Meets the Standard** Applies the Pythagorean Theorem to solve problems; identifies parallel lines graphically and symbolically; partial connection of slope with perpendicular lines.
840	**Partially Meets the Standard** Substitutes numbers in the Pythagorean Theorem to determine hypotenuse; partial connection of slope with parallel lines.
801	**Does Not Meet the Standard** Recognizes the equation for the Pythagorean Theorem; recognizes parallel or perpendicular lines on a graph.

Meets State Standard / *Does Not Meet State Standard*

Data Analysis & Probability

899	
	Exceeds the Standard Given a data set, student determines the line of best fit and interprets the data; assesses reasonableness of predictions in non-routine situations
861	
850	**Meets the Standard** Given a data set, student identifies the line of best fit and interprets the data; makes predictions about the data set.
840	**Partially Meets the Standard** Given a data set, student identifies the line of best fit and makes statements about the general trend of the data.
801	**Does Not Meet the Standard** Generalizes the properties of the line of best fit of a graphed data set; displays data using scatterplots.

Meets State Standard / *Does Not Meet State Standard*