Support for Michigan GLCE Math Standards, grades 4-8

Hello Michigan middle school math teachers!

I hope you enjoy this little guide, designed to help you quickly and easily find support for some of the math expectations you are required to teach your students. My hope is that you find my techniques in *Math Doesn't Suck* and *Kiss My Math* to be fun and effective ways to teach these topics – especially for problem students needing intervention.

And don't read only your grade level – there may be help and support for you in the lower grades' expectations, too. Check out some lower grades for previously misunderstood expectations that may be holding your students back, and clear up those topics for them once and for all!

Most of all, I would love to hear what's working and what suggestions you might have for this guide, or for any other ways I can make *Math Doesn't Suck* and *Kiss My Math* the most useful to teachers like yourself.

Go math!

Danica

P.S. Thank you to Dan Degrow, Sarah Biondo, and Jim Licht for helping to put this together!

For grade levels 4-8, here are the expectations supported either in part or fully within *Math Doesn't Suck* and *Kiss My Math*. For each expectation, just look to the right-hand column for the chapter(s) you need.

Got an expectation that's giving your class trouble? Find a new way of approaching the topic here!

4th Grade

MI GLCE	Expectation	Where to find support!
N.ME.04.02	Compose and decompose numbers using place value.	*Math Doesn't Suck*, Ch.10
N.ME.04.04	Find all factors of any whole number through 50, list factor pairs, and determine if a one-digit number is a factor of a given whole number.	*Math Doesn't Suck*, Ch.1 and 2
N.ME.04.05	List the first ten multiples of a given one-digit whole number; determine if a whole number is a multiple of a given one-digit whole number.	*Math Doesn't Suck*, Ch.3
N.ME.04.06	Know that some numbers including 2, 3, 5, 7, and 11 have exactly two factors (1 and the number itself) and are called prime numbers.	*Math Doesn't Suck*, Ch.1
N.MR.04.07	Use factors and multiples to compose and decompose whole numbers.	*Math Doesn't Suck*, Ch.1-3
N.ME.04.09	Multiply two-digit numbers by 2, 3, 4, and 5, using the distributive property.	*Kiss My Math*, Ch.10
N.FL.04.11	Divide numbers up to four-digits by one-digit numbers and by 10.	*Math Doesn't Suck*, Ch.2
N.FL.04.12	Find the value of the unknowns in equations such as $a \div 10 = 25$; $125 \div b = 25$.	*Kiss My Math*, Ch.12
N.ME.04.15	Read and interpret decimals up to two decimal places; relate to money and place value decomposition.	*Math Doesn't Suck*, Ch.10
N.ME.04.18	Read, write, interpret, and compare decimals up to two decimal places.	*Math Doesn't Suck*, Ch.10

N.ME.04.19	Write tenths and hundredths in decimal and fraction forms, and know the decimal equivalents for halves and fourths.	*Math Doesn't Suck*, Ch.10
N.ME.04.20	Understand fractions as parts of a set of objects.	*Math Doesn't Suck*, Ch.4
N.MR.04.21	Explain why equivalent fractions are equal using models such as fraction strips or the number line for fractions with denominators of 12 or less, or equal to 100.	*Math Doesn't Suck*, Ch.6 and 7
N.MR.04.23	Understand the relationships among halves, fourths, and eighths and among thirds, sixths, and twelfths.	*Math Doesn't Suck*, Ch.4
N.ME.04.24	Know that fractions of the form m/n where m is greater than n, are greater than 1 and are called improper fractions; locate improper fractions on the number line.	*Math Doesn't Suck*, Ch.4
N.MR.04.25	Write improper fractions as mixed numbers, and understand that a mixed number represents the number of "wholes" and the part of a whole remaining, e.g., 5/4 = 1 + 1/4 = 1 1/4.	*Math Doesn't Suck*, Ch.4
N.MR.04.26	Compare and order up to three fractions with denominators 2, 4, and 8, and 3, 6, and 12, including improper fractions and mixed numbers.	*Math Doesn't Suck*, Ch.7
N.MR.04.27	Add and subtract fractions less than 1 with denominators through 12 and/or 100, in cases where the denominators are equal or when one denominator is a multiple of the other, e.g., 1/12 +5/12 =6/12; 1/6 + 5/12 = 7/12; 3/10 −23/100= 7/100.	*Math Doesn't Suck*, Ch.8
N.MR.04.28	Solve contextual problems involving sums and differences for fractions where one denominator is a multiple of the other (denominators 2 through 12, and 100).	*Math Doesn't Suck*, Ch.8
N.MR.04.29	Find the value of an unknown in equations such as 1/8 + x = 5/8 or 3/4 - y = 1/2.	*Math Doesn't Suck*, Ch.8, 20
N.MR.04.30	Multiply fractions by whole numbers, using repeated addition and area or array models.	*Math Doesn't Suck*, Ch.5
N.MR.04.32	For problems that use addition and subtraction of decimals through hundredths, represent with mathematical statements and solve.	*Math Doesn't Suck*, Ch.10

N.MR.04.32	Add and subtract decimals through hundredths.	*Math Doesn't Suck*, Ch.10
N.FL.04.33	Multiply and divide decimals up to two decimal places by a one-digit whole number where the result is a terminating decimal, e.g., $0.42 \div 3 = 0.14$ but not $5 \div 3 = 1.\overline{6}$.	*Math Doesn't Suck,* Ch.10, 11
N.FL.04.36	Make appropriate estimations and calculations fluently with whole numbers using mental math strategies.	*Math Doesn't Suck*, Ch.1
M.UN.04.03	Measure and compare integer temperatures in degrees.	*Kiss My Math*, Ch.1
M.TE.04.05	Carry out conversions from one unit of measure to a larger or smaller unit of measure.	*Math Doesn't Suck*, Ch.19
D.RE.04.02	Order a given set of data, find the median, and specify the range of values.	*Kiss My Math*, Ch.5

5th Grade

MI GLCE	Expectation	Where to find support!
N.MR.05.01	Understand the meaning of division of whole numbers with and without remainders; relate division to fractions and to repeated subtraction.	*Math Doesn't Suck*, Ch. 1, 3
N.MR.05.02	Relate division of whole numbers with remainders to the form $a = bq + r$, e.g., $34 \div 5 = 6\ r\ 4$, so $5 \bullet 6 + 4 = 34$; note remainder (4) is less than divisor (5).	*Math Doesn't Suck*, Ch. 4
N.MR.05.03	Write mathematical statements involving division for given situations.	*Math Doesn't Suck*, Ch.15
N.MR.05.06	Divide fluently up to a four-digit number by a two-digit number	www.mathdoesntsuck.com; click on "Extras" page for "Long Division Review" PDF.

N.MR.05.07	Find the prime factorization of numbers from 2 through 50, express in exponential notation, e.g. $24 = 2^2 \times 3^2$, and understand that every whole number greater than 1 is either prime or can be expressed as a product of primes.	*Math Doesn't Suck*, Ch.2
N.MR.05.08	Understand the relative magnitude of ones, tenths, hundredths and the relationship of each place value to the place on its right, e.g., one is 10 tenths, one tenth is 10 hundredths.	*Math Doesn't Suck*, Ch.10
N.ME.05.09	Understand percentages as parts out of 100, use % notation, and express a part of a whole as a percentage.	*Math Doesn't Suck*, Ch.15
N.ME.05.10	Understand a fraction as a statement of division, e.g., 2 ÷ 3 = 2/3, using simple fractions and pictures to represent.	*Math Doesn't Suck*, Ch.4, 9 and 11
N.ME.05.11	Given two fractions, e.g., 1/2 and 1/4, express them as fractions with a common denominator, but not necessarily a least common denominator, e.g., 1/2 = 4/8 and 3/4 = 6/8; use denominators less than 12 or factors of 100.	*Math Doesn't Suck*, Ch.7
N.ME.05.12	Find the productof two unit fractions with small denominators using an area model.	*Math Doesn't Suck*, Ch.5
N.MR.05.13	Divide a fraction by a whole number and a whole number by a fraction, using simple unit fractions.	*Math Doesn't Suck*, Ch.5, 9, 14
N.FL.05.14	Add and subtract fractions with unlike denominators through 12 and/or 100, using the common denominator that is the product of the denominators of the 2 fractions, e.g., 3/8 + 7/10: use 80 as the common denominator.	*Math Doesn't Suck*, Ch.5 and 8
N.MR.05.15	Multiply a whole number by powers of 10: 0.01, 0.1, 1, 10, 100, 1,000; and identify patterns.	*Math Doesn't Suck*, Ch.10
N.FL.05.16	Divide numbers by 10's, 100's, 1,000's using mental strategies.	*Math Doesn't Suck*, Ch.10

N.MR.05.17	Multiply one-digit and two-digit whole numbers by decimals up to two decimal places.	*Math Doesn't Suck,* Ch.10
N.FL05.18	Use mathematical statements to represent an applied situation involving addition and subtraction of fractions.	*Math Doesn't Suck,* Ch.8
N.MR.05.19	Solve contextual problems that involve finding sums and differences of fractions with unlike denominators using knowledge of equivalent fractions.	*Math Doesn't Suck*, Ch.8
N.FL.05.20	Solve applied problems involving fractions and decimals; include rounding of answers and checking reasonableness.	*Math Doesn't Suck,* Ch.9, 10
N.MR.05.21	Solve for the unknown in equations such as $1/4 + x = 7/12$.	*Math Doesn't Suck*, Ch.20
N.MR.05.22	Express fractions and decimals as percentages and vice versa.	*Math Doesn't Suck,* Ch.13
N.MR.05.23	Express ratios in several ways given applied situations, e.g., 3 cups to 5 people, 3:5, 3/5 ; recognize and find equivalent ratios.	*Math Doesn't Suck,* Ch.16
M.UN.05.01	Recognize the equivalence of 1 liter, 1,000 ml and 1,000 cm^3 and include conversions among liters, milliliters, and cubic centimeters.	*Math Doesn't Suck,* Ch.19
M.UN.05.04	Convert measurements of length, weight, area, volume, and time within a given system using easily manipulated numbers.	*Math Doesn't Suck,* Ch.19
D.RE.05.02	Construct line graphs from tables of data; include axis labels and scale.	*Kiss My Math*, Ch.18
D.AN.05.03	Given a set of data, find and interpret the mean (using the concept of fair share) and mode.	*Kiss My Math,* Ch.5
D.AN.05.04	Solve multi-step problems involving means.	*Kiss My Math*, Ch.5

6th Grade

MI GLCE	Expectation	Where to find support!
N.MR.06.01	Understand division of fractions as the inverse of multiplication, e.g., if 4/5 ÷ 2/3 = 12/10, then 2/3 • 12/10 = 4/5, so 4/5 • 3/2 = 12/10.	*Math Doesn't Suck,* Ch.5, 9
N.MR.06.03	Solve for the unknown in equations such as: 1/4 ÷ x = 1, 3/4 ÷ x = 1/4, and 1/2 = 1 • x.	*Math Doesn't Suck,* Ch.20
N.FL.06.02	Given an applied situation involving dividing fractions, write a mathematical statement to represent the situation.	*Math Doesn't Suck,* Ch.5, 9
N.FL.06.04	Multiply and divide any two fractions, including mixed numbers, fluently.	*Math Doesn't Suck,* Ch.5, 9, 13
N.ME.06.05	Order rational numbers and place them on the number line.	*Math Doesn't Suck,* Ch.10
N.ME.06.06	Represent rational numbers as fractions or terminating decimals when possible, and translate between these representations.	*Math Doesn't Suck,* Ch.11, 12
N.ME.06.07	Understand that a fraction or a negative fraction is a quotient of two integers, e.g., -8/3 is -8 divided by 3.	*Kiss My Math*, Ch.3
N.ME.06.08	Understand integer subtraction as the inverse of integer addition. Understand integer division as the inverse of integer multiplication.	*Kiss My Math,* Ch.1, 3
N.ME.06.09	Add and multiply integers between -10 and 10; subtract and divide integers using the related facts. Use the number line and chip models for addition and subtraction.	*Kiss My Math,* Ch.1, 3
N.FL.06.10	Add, subtract, multiply and divide positive rational numbers fluently.	*Math Doesn't Suck*, Ch.5, 8
N.ME.06.11	Find equivalent ratios by scaling up or scaling down.	*Math Doesn't Suck,* Ch.16

N.FL.06.12	Calculate part of a number given the percentage and the number.	*Math Doesn't Suck*, Ch.15
N.FL.06.13	Solve contextual problems involving percentages such as sales Taxes and tips.	*Math Doesn't Suck*, Ch.15
N.FL.06.15	Solve applied problems that use the four operations with appropriate decimal numbers.	*Math Doesn't Suck*, Ch.10
N.ME.06.16	Understand and use integer exponents, excluding powers of negative bases.	*Kiss My Math*, Ch.15
N.ME.06.17	Locate negative rational numbers (including integers) on the number line; know that numbers and their negatives add to 0, and are on opposite sides and at equal distance from 0 on a number line.	*Kiss My Math*, Ch.1, 3
N.ME.06.18	Understand that rational numbers are quotients of integers (non zero denominators), e.g., a rational number is either a fraction or a negative fraction.	*Kiss My Math,* Appendix
N.ME.06.19	Understand that 0 is an integer that is neither negative nor positive.	*Kiss My Math*, Ch.1
N.ME.06.20	Know that the absolute value of a number is the value of the number ignoring the sign; or is the distance of the number from 0.	*Kiss My Math,* Ch.4
A.PA.06.01	Solve applied problems involving rates, including speed, e.g., if a car is going 50 mph, how far will it go in 3 1/2 hours?	*Math Doesn't Suck*, Ch.17
A.FO.06.03	Use letters, with units, to represent quantities in a variety of contexts, e.g., y lbs., k minutes, x cookies.	*Math Doesn't Suck*, Ch.20
A.FO.06.04	Distinguish between an algebraic expression and an equation.	*Math Doesn't Suck*, Ch.20 *Kiss My Math*, Ch.6
A.FO.06.05	Use standard conventions for writing algebraic expressions, e.g., $2x + 1$ means "two times x, plus 1" and $2(x + 1)$ means "two times the quantity $(x + 1)$."	*Kiss My Math*, Ch.11

A.FO.06.06	Represent information given in words using algebraic expressions and equations.	*Math Doesn't Suck*, Ch.20, 21 *Kiss My Math*, Ch.6, 11
A.FO.06.07	Simplify expressions of the first degree by combining like terms, and evaluate using specific values.	*Kiss My Math*, Ch. 9
A.RP.06.08	Understand that relationships between quantities can be suggested by graphs and tables.	*Kiss My Math*, Ch. 17, 18
A.FO.06.11	Relate simple linear equations with integer coefficients, e.g., 3x = 8 or x + 5 = 10, to particular contexts and solve.	*Math Doesn't Suck*, Ch.20, 21 *Kiss My Math*, Ch.12
A.FO.06.12	Understand that adding or subtracting the same number to both sides of an equation creates a new equation that has the same solution.	*Math Doesn't Suck*, Ch.20, 21 *Kiss My Math*, Ch.12
A.FO.06.13	Understand that multiplying or dividing both sides of an equation by the same non-zero number creates a new equation that has the same solutions.	*Math Doesn't Suck*, Ch.20, 21 *Kiss My Math*, Ch.12
A.FO.06.14	Solve equations of the form ax + b = c, e.g., 3x + 8 = 15 by hand for positive integer coefficients less than 20, use calculators otherwise, and interpret the results.	*Math Doesn't Suck*, Ch.20, 21 *Kiss My Math*, Ch.12
M.UN.06.01	Convert between basic units of measurement within a single measurement system, e.g., square inches to square feet.	*Math Doesn't Suck*, Ch.19

7th Grade

MI GLCE	Expectation	Where to find support!
N.FL.07.03	Calculate rates of change including speed.	*Math Doesn't Suck*, Ch.17
N.MR.07.04	Convert ratio quantities between different systems of units, such as feet per second to miles per hour.	*Math Doesn't Suck*, Ch.17, 19

N.FL.07.05	Solve proportion problems using such methods as unit rate, scaling, finding equivalent fractions, and solving the proportion equation $a/b = c/d$.	*Math Doesn't Suck*, Ch.18
N.FL.07.07	Solve problems involving operations with integers.	*Kiss My Math*, Ch.12
N.FL.07.08	Add, subtract, multiply, and divide positive and negative rational numbers fluently.	*Kiss My Math*, Ch.1, 3
A.PA.07.01	Recognize when information given in a table, graph, or formula suggests a directly proportional or linear relationship.	*Kiss My Math,* Ch.17, 18
A.RP.07.02	Represent directly proportional and linear relationships using verbal descriptions, tables, graphs, and formulas, and translate among these representations.	*Kiss My Math,* Ch.17, 18
A.PA.07.03	Given a directly proportional or other linear situation, graph and interpret the slope and intercept(s) in terms of the original situation; evaluate $y = mx + b$ for specific x values.	*Kiss My Math,* Ch.18
A.PA.07.06	Calculate the slope from the graph of a linear function as the ratio of "rise/run" for a pair of points on the graph, and express the answer as a fraction and a decimal; understand that linear functions have slope that is a constant rate of change.	*Kiss My Math,* Ch.18
A.PA.07.07	Represent linear functions in the form $y = x + b$, $y = mx$, and $y = mx + b$, and graph, interpreting slope and y-intercept.	*Kiss My Math*, Ch.18
A.PA.07.11	Understand and use basic properties of real numbers: additive and multiplicative identities, additive and multiplicative inverses, commutativity, associativity, and the distributive property of multiplication over addition.	*Kiss My Math,* Ch.2, 10, Appendix
D.AN.07.04	Find and interpret the median, quartiles, and interquartile range of a given set of data.	*Kiss My Math,* Ch.5

8th Grade

MI GLCE	Expectation	Where to find support!
N.ME.08.03	Understand that in decimal form, rational numbers either terminate or eventually repeat, and that calculators truncate or round repeating decimals; locate rational numbers on the number line; know fraction forms of common repeating decimals, e.g., 0.1= 1/9; 0.3= 1/3.	*Math Doesn't Suck,* Ch.11
N.FL.08.11	Solve problems involving ratio units, such as miles per hour, dollars per pound, or persons per square mile.	*Math Doesn't Suck,* Ch.18
A.FO.08.10	Understand that to solve the equation $f(x) = g(x)$ means to find all values of x for which the equation is true, e.g., determine whether a given value, or values from a given set, is a solution of an equation (0 is a solution of $3x2 + 2 = 4x + 2$, but 1 is not a solution).	*Kiss My Math,* Ch.12, 14
A.FO.08.11	Solve simultaneous linear equations in two variables by substitution; include examples with no solutions and infinitely many solutions.	*Kiss My Math,* Ch.12, 13
A.FO.08.12	Solve linear inequalities in one and two variables, and graph the solution sets.	*Kiss My Math,* Ch.14
D.PR.08.01	Determine which measure of central tendency (mean, median, mode) best represents a data set, e.g., salaries, home prices, for answering certain questions; justify the choice made.	*Kiss My Math,* Ch.5