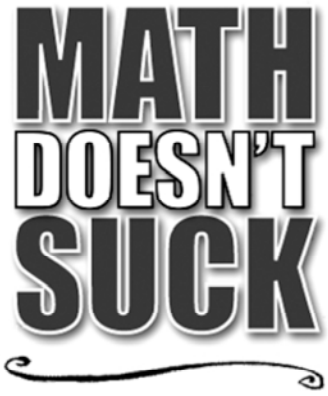

Support for NCTM Math Standards, grades 3-8

Hello middle school math teachers!

I hope you enjoy this little guide, designed to help you quickly and easily find support for some of the NCTM math expectations that you 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.

NCTM breaks their middle school standards into grades 3-5, then 6-8. 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

Here are the NCTM expectations for middle school 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!

NCTM Standards for Grades 3-5

Numbers and Operations Standards for grades 3-5

NCTM Standard	Expectation	Where to find support!
Understand numbers, ways of representing numbers, relationships among numbers, and number systems	• understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals;	*Math Doesn't Suck*, chapter 10 *Kiss My Math*, chapter 15
(Continued)	• recognize equivalent representations for the same number and generate them by decomposing and composing numbers;	*Math Doesn't Suck*, chapter 13
(Continued)	• develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers;	*Math Doesn't Suck*, chapter 4
(Continued)	• use models, benchmarks, and equivalent forms to judge the size of fractions;	*Math Doesn't Suck*, chapters 6, 7
(Continued)	• recognize and generate equivalent forms of commonly used fractions, decimals, and percents;	*Math Doesn't Suck*, chapters 6, 10, 13
(Continued)	• explore numbers less than 0 by extending the number line	*Kiss My Math,* Appendix

	and through familiar applications;	
(Continued)	• describe classes of numbers according to characteristics such as the nature of their factors.	*Math Doesn't Suck*, chapter 1
Understand meanings of operations and how they relate to one another	• understand various meanings of multiplication and division;	*Math Doesn't Suck*, chapter 4 *Kiss My Math*, chapter 3
(Continued)	• understand the effects of multiplying and dividing whole numbers;	*Math Doesn't Suck*, chapter 4 *Kiss My Math*, chapter 3
(Continued)	• identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems;	*Kiss My Math*, chapter 12
(Continued)	• understand and use properties of operations, such as the distributivity of multiplication over addition.	*Kiss My Math*, chapter 10
(Continued)	• develop fluency in adding, subtracting, multiplying, and dividing whole numbers;	*Math Doesn't Suck*, website. See "division" PDF at: Mathdoesntsuck.com/extras *Kiss My Math*, chapters 3, 7
(Continued)	• develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience;	*Math Doesn't Suck*, chapters 5, 10, and throughout (look for "Reality Math" and "Danica's Diary" sections)
(Continued)	• use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals;	*Math Doesn't Suck*, chapters 8, 10

Algebra Standards for grades 3-5

NCTM Standard	Expectation	Where to find support!
Understand patterns, relations, and functions	•represent and analyze patterns and functions, using words, tables, and graphs.	*Kiss My Math*, chapters 5, 18
Represent and analyze mathematical situations and structures using algebraic symbols	●identify such properties as commutativity, associativity, and distributivity and use them to compute with whole numbers;	*Kiss My Math*, chapters 2, 10
(Continued)	●represent the idea of a variable as an unknown quantity using a letter or a symbol;	*Math Doesn't Suck*, chapters 20, 21 *Kiss My Math*, chapter 6
(Continued)	●express mathematical relationships using equations.	*Math Doesn't Suck*, chapter 20, 21 *Kiss My Math*, chapters 6, 11
Use mathematical models to represent and understand quantitative relationships	●model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.	*Kiss My Math*, chapters 5, 17
Analyze change in various contexts	●investigate how a change in one variable relates to a change in a second variable;	*Math Doesn't Suck*, chapter 18 *Kiss My Math*, chapter 11, 13
(Continued)	●identify and describe situations with constant or varying rates of change and compare them.	*Math Doesn't Suck*, chapter 15 *Kiss My Math*, chapter 13

Measurement Standards for grades 3-5

Understand measurable attributes of objects and the units, systems, and processes of measurement	• understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute;	*Math Doesn't Suck*, chapter 19
(Continued)	• carry out simple unit conversions, such as from centimeters to meters, within a system of measurement;	*Math Doesn't Suck*, chapter 19
(Continued)	• understand that measurements are approximations	*Math Doesn't Suck*, chapter 19

Data Analysis and Probability Standards for grades 3-5

Select and use appropriate statistical methods to analyze data	• describe the shape and important features of a set of data and compare related data sets, with an emphasis on how the data are distributed;	*Kiss My Math*, chapter 5
(Continued)	• use measures of center, focusing on the median, and understand what each does and does not indicate about the data set;	*Kiss My Math*, chapter 5

Problem Solving Standards for grades 3-5

Instructional programs from prekindergarten through grade 12 should enable all students to -	• build new mathematical knowledge through problem solving;	Throughout both books: Look especially for "Reality Math" and "Danica's Diary" sections.
(Continued)	• solve problems that arise in mathematics and in other contexts;	Throughout both books: Look especially for "Reality Math" and "Danica's Diary" sections.
(Continued)	• apply and adapt a variety of	Throughout both books: Look

	appropriate strategies to solve problems;	especially for “Reality Math” and “Danica’s Diary” sections.
(Continued)	• monitor and reflect on the process of mathematical problem solving.	Throughout both books: Look especially for “Reality Math” and “Danica’s Diary” sections.

Communication Standards for grades 3-5

Instructional programs from prekindergarten through grade 12 should enable all students to -	• organize and consolidate their mathematical thinking through communication;	Throughout both books: Look especially for “Reality Math” and “Danica’s Diary” sections.
(Continued)	• communicate their mathematical thinking coherently and clearly to peers, teachers, and others;	Throughout both books: Look especially for “Reality Math” and “Danica’s Diary” sections.
(Continued)	• analyze and evaluate the mathematical thinking and strategies of others;	Throughout both books: Look especially for “Reality Math” and “Danica’s Diary” sections.
(Continued)	• use the language of mathematics to express mathematical ideas precisely.	*Math Doesn’t Suck*, chapters 20, 21 *Kiss My Math*, chapters 6, 11, 13

Connections Standards for grades 3-5

Instructional programs from prekindergarten through grade 12 should enable all students to -	• recognize and use connections among mathematical ideas;	Throughout both books: Look especially for “Reality Math” and “Danica’s Diary” sections.
(Continued)	• understand how mathematical ideas interconnect and build on one another to produce a coherent whole;	Throughout both books: Look especially for “Reality Math” and “Danica’s Diary” sections.
(Continued)	• recognize and apply mathematics in contexts outside of mathematics.	Throughout both books: Look especially for “Reality Math” and “Danica’s Diary” sections.

NCTM Standards for Grades 6-8

Numbers and Operations Standards for grades 6-8

NCTM Standard	Expectation	Where to find support!
Understand numbers, ways of representing numbers, relationships among numbers, and number systems	• work flexibly with fractions, decimals, and percents to solve problems;	*Math Doesn't Suck*, chapters 4-15
(Continued)	• compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line;	*Math Doesn't Suck*, chapters 7, 10, 13
(Continued)	• develop meaning for percents greater than 100 and less than 1;	*Math Doesn't Suck*, chapters 13, 14
(Continued)	• understand and use ratios and proportions to represent quantitative relationships;	*Math Doesn't Suck*, chapters 16-18
(Continued)	• use factors, multiples, prime factorization, and relatively prime numbers to solve problems;	*Math Doesn't Suck*, chapters 1-3
(Continued)	• develop meaning for integers and represent and compare quantities with them.	*Kiss My Math*, chapter 1
Understand meanings of operations and how they relate to one another	• understand the meaning and effects of arithmetic operations with fractions, decimals, and integers;	*Math Doesn't Suck*, chapters 5, 8,10 *Kiss My Math*, chapters 3, 7
(Continued)	• use the associative and commutative properties of addition and multiplication and the distributive property of multiplication over addition to simplify computations with integers, fractions, & decimals;	*Kiss My Math*, chapters 2, 10

(Continued)	• understand and use the inverse relationships of addition and subtraction, multiplication and division, and squaring and finding square roots to simplify computations and solve problems.	*Kiss My Math*, chapter 12
(Continued)	• develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios.	*Math Doesn't Suck*, chapters 16, 18
(Continued)	• develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use;	*Math Doesn't Suck*, chapters 5, 8, 10 *Kiss My Math*, chapters 3, 7

Algebra Standards for grades 6-8

Understand patterns, relations, and functions	• represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules;	*Kiss My Math*, chapters 5, 17 and throughout
(Continued)	• relate and compare different forms of representation for a relationship;	*Math Doesn't Suck*, chapter 13
(Continued)	• identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations.	*Kiss My Math*, chapters 17, 18
Represent and analyze mathematical situations and structures using algebraic symbols	• develop an initial conceptual understanding of different uses of variables;	*Math Doesn't Suck*, chapters 20, 21 *Kiss My Math*, chapters 6, 11
(Continued)	• explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope;	*Kiss My Math*, chapters 17, 18
(Continued)	• use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships;	*Math Doesn't Suck*, chapters 20, 21 *Kiss My Math*, chapters 11, 13

(Continued)	• recognize and generate equivalent forms for simple algebraic expressions and solve linear equations	*Kiss My Math*, chapter 12
Use mathematical models to represent and understand quantitative relationships	• model and solve contextualized problems using various representations, such as graphs, tables, and equations.	*Kiss My Math*, chapters 13
Analyze change in various contexts	• use graphs to analyze the nature of changes in quantities in linear relationships.	*Kiss My Math*, chapter 18

Measurement Standards for grades 6-8

Understand measurable attributes of objects and the units, systems, and processes of measurement	•understand relationships among units and convert from one unit to another within the same system;	*Math Doesn't Suck*, chapter 19
(Continued)	•solve problems involving scale factors, using ratio and proportion;	*Math Doesn't Suck*, chapters 16-18
(Continued)	•solve simple problems involving rates and derived measurements for such attributes as velocity and density.	*Math Doesn't Suck*, chapter 17

Data Analysis and Probability Standards for grades 6-8

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them	•formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population;	*Kiss My Math*, chapter 5
Select and use appropriate statistical methods to analyze data	•find, use, and interpret measures of center and spread, including mean and interquartile range;	*Kiss My Math*, chapter 5

Problem Solving Standards for grades 6-8

Instructional programs from prekindergarten through grade 12 should enable all students to-	•build new mathematical knowledge through problem solving;	Throughout both books: Look especially for "Reality Math" and "Danica's Diary" sections.
(Continued)	•solve problems that arise in mathematics and in other contexts;	Throughout both books: Look especially for "Reality Math" and "Danica's Diary" sections.
(Continued)	•apply and adapt a variety of appropriate strategies to solve problems;	Throughout both books: Look especially for "Reality Math" and "Danica's Diary" sections.
(Continued)	•monitor and reflect on the process of mathematical problem solving.	Throughout both books: Look especially for "Reality Math" and "Danica's Diary" sections.

Communications Standards for grades 6-8

Instructional programs from prekindergarten through grade 12 should enable all students to-	•organize and consolidate their mathematical thinking through communication;	Throughout both books: Look especially for "Reality Math" and "Danica's Diary" sections.
(Continued)	•communicate their mathematical thinking coherently and clearly to peers, teachers, and others;	Throughout both books: Look especially for "Reality Math" and "Danica's Diary" sections.
(Continued)	•analyze and evaluate the mathematical thinking and strategies of others;	Throughout both books: Look especially for "Reality Math" and "Danica's Diary" sections.
(Continued)	•use the language of mathematics to express mathematical ideas precisely.	*Math Doesn't Suck*, chapters 20, 21 *Kiss My Math*, chapters 6, 11, 13

Connections Standards for grades 6-8

Instructional programs from prekindergarten through grade 12 should enable all students to-	• recognize and use connections among mathematical ideas;	Throughout both books: Look especially for “Reality Math” and “Danica’s Diary” sections.
(Continued)	• understand how mathematical ideas interconnect and build on one another to produce a coherent whole;	Throughout both books: Look especially for “Reality Math” and “Danica’s Diary” sections.
(Continued)	• recognize and apply mathematics in contexts outside of mathematics.	Throughout both books: Look especially for “Reality Math” and “Danica’s Diary” sections.

Representation Standards for grades 6-8

Instructional programs from prekindergarten through grade 12 should enable all students to-	•create and use representations to organize, record, and communicate mathematical ideas;	*Math Doesn’t Suck*, chapter 20, 21 *Kiss My Math*, chapters 11, 13, 17, 18
(Continued)	•select, apply, and translate among mathematical representations to solve problems;	*Math Doesn’t Suck*, chapter 20, 21 *Kiss My Math*, chapters 11, 13, 17, 18
(Continued)	•use representations to model and interpret physical, social, and mathematical phenomena.	*Math Doesn’t Suck*, chapter 20, 21 *Kiss My Math*, chapters 11, 13, 17, 18