

MATH *Connections* Correlation to the Colorado Model Content Standards for Mathematics

MATH <i>Connections</i> Book	MC 1A				MC 1B				MC 2A			MC 2B			MC 3A				MC 3B			
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Six Goals for Colorado Students of Mathematics																						
Become mathematical problem solvers. To be problem solvers, students need to know how to find ways to reach a goal when no routine path is apparent. To develop the flexibility, perseverance, and wealth of strategies that are characteristic of good problem solvers, students need to be challenged frequently and regularly with non-routine problems, including those they pose themselves.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Learn to communicate mathematically. The development of students' power to use mathematics involves learning the signs, symbols, and terms of mathematics. This is best accomplished in problem situations where students have an opportunity to read, write, and discuss ideas in the language of mathematics. As students communicate their ideas, they learn to clarify, refine, and consolidate their thinking.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Learn to reason mathematically. Students who reason mathematically gather data, make conjectures*, assemble evidence, and build an argument to support or refute these conjectures. Such processes are fundamental to doing mathematics.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Make mathematical connections. The study of mathematics should provide students with many opportunities to make connections among mathematical ideas (for example, the connection between geometric and algebraic concepts) and among mathematics and other disciplines (for example, art, music, psychology, science, business). The curriculum should portray mathematics as an integrated whole that permeates activities both in and out of school. These connections make mathematics meaningful and useful to each Colorado student.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Become confident of their mathematical abilities. As a result of studying mathematics, students need to view themselves as capable of using their growing mathematical power to make sense of new problem situations in the world around them.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
School mathematics must endow all students with a realization that doing mathematics is a common human activity. Students learn to trust their own mathematical thinking by having numerous and varied experiences.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Learn the value of mathematics. In addition to providing the tools to solve problems, mathematics provides a way of thinking about and understanding the world around us. Students should have numerous and varied opportunities to think mathematically about their world. They should also explore the cultural, historical, and scientific evolution of mathematics so that they can appreciate the role of mathematics in the development of our contemporary society.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Colorado Model Content Standards																						
1. Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2. Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X
3. Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.	X	X	X	X	X	X	X	X	X				X					X				
4. Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.									X	X	X	X	X	X								X
5. Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6. Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Solve problems and model real-world situations using patterns and functions	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Compare and contrast different types of functions		X	X			X				X	X				X	X	X	X	X	X		
Describe the connections among representations of patterns and functions, including words, tables, graphs, and symbols	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Modeling real-world phenomena (for example, distance-versus-time relationships, compound interest, amortization tables, mortality rates) using functions, equations, inequalities, and matrices;		X		X	X	X		X			X					X	X	X	X	X		
Representing functional relationships using written explanations, tables, equations, and graphs, and describing the connections among these representations;	X	X	X	X	X	X				X	X	X			X	X	X	X	X	X		
Solving problems involving functional relationships using graphing calculators and/or computers as well as appropriate paper-and-pencil techniques;			X	X	X	X					X	X	X		X	X	X	X			X	X
Analyzing and explaining the behaviors, transformations, and general properties of types of equations and functions (for example, linear, quadratic, exponential);		X	X			X					X				X	X	X	X			X	
Interpreting algebraic equations and inequalities geometrically and describing geometric relationships algebraically.			X	X	X	X				X	X	X	X	X	X	X	X	X	X			X
For students continuing their mathematics education beyond these standards, what they know and are able to do may include																						
Using rational, polynomial, trigonometric, and inverse functions to model real-world phenomena																X	X	X	X	X		X
Representing and solving problems using linear programming and difference equations;																				X		
Solving systems of linear equations using matrices and vectors														X						X		
Describing the concept of continuity of a function;						X																X
Performing operations on and between functions			X			X										X	X	X				
Making the connections between trigonometric functions and polar coordinates, complex numbers, and series. <i>* MATH Connections covers this in the Extensions.</i>																						* X

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STANDARD 3: Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.																					
In order to meet this standard, a student will																					
Solve problems by systematically collecting, organizing, describing, and analyzing data using surveys, tables, charts, and graphs;	X	X		X	X	X		X			X	X			X	X	X	X			
Make valid inferences, decisions, and arguments based on data analysis; and	X			X	X	X		X			X	X				X	X	X			
Use counting techniques, experimental probability, or theoretical probability, as appropriate, to represent and solve problems involving uncertainty.							X	X										X			
Designing and conducting a statistical experiment to study a problem, and interpreting and communicating the results using the appropriate technology (for example, graphing calculators, computer software):	X																X				
Analyzing statistical claims for erroneous conclusions or distortions;	X																X				
Fitting curves to scatter plots, using informal methods or appropriate technology, to determine the strength of the relationship between two data sets and to make predictions;				X	X						X			X	X	X					
Drawing conclusions about distributions of data based on analysis of statistical summaries (for example, the combination of mean and standard deviation, and differences between the mean and median);	X																	X			
Using experimental and theoretical probability to represent and solve problems involving uncertainty (for example, the chance of playing professional sports if a student is a successful high school athlete);								X										X			
Solving real-world problems with informal use of combinations and permutations (for example, determining the number of possible meals at a restaurant featuring a given number of side dishes).								X										X			
For students continuing their mathematics education beyond these standards, what they know and are able to do may include																					
Creating and interpreting discrete and continuous probability distributions, and understanding their application to real-world situations (for example, insurance);																		X			

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Describing, analyzing, and extending patterns produced by processes of geometric change (example, limits and fractals).											X	X										X
STANDARD 5: Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.																						
In order to meet this standard, a student will																						
Understand and apply the attributes of length, capacity, weight, mass, time, temperature, perimeter, area, volume, and angle measurement in problem-solving situations;	X		X			X				X	X	X	X	X								
Make and use direct and indirect measurements to describe and compare real-world phenomena										X	X											
Understand the structure and use of systems of measurement;	X		X			X				X	X											
Describe and use rates of change (for example, temperature as it changes throughout the day, or speed as the rate of change of distance over time) and other derived measures; and		X	X								X						X					
Select appropriate units, including metric and U. S. customary, and tools (for example, rulers, protractors, compasses, thermometers) to measure to the degree of accuracy required to solve a given problem.											X	X										
Measuring quantities indirectly using techniques of algebra, geometry, or trigonometry; measuring quantities indirectly using techniques of algebra, geometry, or trigonometry;										X	X	X	X	X								
Selecting and using appropriate techniques and tools to measure quantities in order to achieve specified degrees of precision, accuracy, and error (or tolerance) of measurements;										X	X											
Determining the degree of accuracy of a measurement (for example, by understanding and using significant digits).											X	X	X									
For students continuing their mathematics education beyond these standards, what they know and are able to do may include																						
Demonstrating the meanings of area under a curve and length of an arc													X									X
STANDARD 6: Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.																						
In order to meet this standard, a student will																						
Model, explain, and use the four basic operations - addition,																						

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subtraction, multiplication, and division - in problem-solving situations;		X	X			X	X		X													
Develop, use, and analyze algorithms; and		X			X												X	X		X		
Select and apply appropriate computational techniques to solve a variety of problems and determine whether the results are reasonable	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Using ratios, proportions, and percents in problem-solving situations	X	X				X		X	X	X	X						X	X				
Selecting and using appropriate methods for computing with real numbers in problem-solving situations from among mental arithmetic, estimation, paper-and-pencil, calculator, and computer methods, and determining whether the results are reasonable; and	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Describing the limitations of estimation, and assessing the amount of error resulting from estimation within acceptable limits.										X	X	X										
For students continuing their mathematics education beyond these standards, what they know and are able to do may include																						
Analyzing and solving optimization problems;																					X	
Analyzing different algorithms (for example, sorting) for efficiency;	X				X															X		
Analyzing and using critical path algorithms (for example, determining in which order to perform a set of tasks in a large project); and																		X	X			
Investigating problem situations that arise in connection with computer validation and the application of algorithms.								X												X		