

MATH Connections correlation to Missouri Standards

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	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 7	Chapter 8	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 7	Chapter 8	

I. Problem Solving

By the end of grade 12, all students should know:

1. Problem-solving strategies such as organizing data, drawing a picture, looking for a pattern, modeling, researching, and algebraic strategies.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
2. Computational strategies for the set of real numbers.	XX		X		XX		X		X						X							XX	
3. Models, calculators, computers, charts, graphs, etc., may be used as problem-solving tools.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
4. Mathematical problem-solving strategies can apply to all disciplines and real-world problems.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

By the end of grade 12, all students should be able to:

a. use problem-solving strategies to investigate and understand mathematical content (NCTM Standard 1; MO 1.6, 3.5)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
b. recognize and formulate problems from situations within and outside mathematics (NCTM Standard 1; MO 3.1, 3.5)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
c. organize, develop and apply integrated mathematical problem-solving strategies to solve problems within and outside mathematics (NCTM Standard 1; MO 3.2, 3.3)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
d. apply the process of mathematical modeling to real-world problem situations (NCTM Standard 1; MO 2.1, 3.6)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

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e. analyze, evaluate, and reflect upon the process(es) used in solving problems (NCTM Standard 1; MO 2.2, 3.4, 3.6, 3.7, 3.8)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
II. Communication																						
By the end of grade 12, all students should know:																						
1. The language of mathematics may be used through reading, writing, listening, and speaking.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
2. Mathematical ideas may be represented with visual models.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
3. Mathematical symbols may be used to represent a variety of situations.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
4. Information may be organized in a variety of ways.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
By the end of grade 12, all students should be able to:																						
a. reflect upon and clarify thinking about mathematical ideas and relationships (NCTM Standard 2; MO 1.6, 2.2)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
b. interpret generalizations discovered through investigations to formulate, revise, and adjust mathematical definitions (NCTM Standard 2; MO 1.2, 1.7, 2.2)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
c. visualize mathematical ideas by reading about, listening to, or viewing concrete models (NCTM Standard 2; MO 1.9, 2.4)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
d. plan and create effective verbal and non-verbal forms of communicating mathematics for a variety of purposes and audiences (NCTM Standard 2; MO 2.1)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

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	e. present mathematical ideas and logical justifications, both written and oral (NCTM Standard 2; MO 2.1, 3.5, 4.1)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
f. ask clarifying and extending questions about the mathematics read about, heard about, or viewed through models (NCTM Standard 2; MO 2.3)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
g. recognize the economy, power, and elegance of mathematics notation and its role in the development of mathematical ideas (NCTM Standard 2; MO 1.6, 1.9, 2.4)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
h. read, write, and talk about mathematical ideas as they relate to real-life applications and multiple workplace situations (NCTM Standard 2; MO 1.10, 2.6, 3.2, 4.8)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
III. Reasoning																						
By the end of grade 12, all students should know:																						
1. Information may be organized in a variety of forms to look for patterns and relationships.	XX	XX	XX	XX	XX	XX	XX	XX	X	X	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
2. Results must be justified.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
3. Geometric and number properties.	XX		XX				X		XX	XX		XX	XX	XX	X				X	XX	XX	
4. The process of inductive reasoning.		X							X			X									XX	
5. The process of deductive reasoning.												XX	XX							XX	X	XX
By the end of grade 12, all students should be able to:																						
a. make and test conjectures (NCTM Standard 3; MO 1.7)	X	X	X	XX	XX	XX	X	XX	XX	XX	X	XX	XX	X	X	X	X	X	X	XX	XX	XX
b. defend the validity of their conclusions using mathematical strategies (NCTM Standard 3; MO 3.4, 3.7, 3.8, 4.1)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

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c. follow the mathematical reasoning of others and determine validity (NCTM Standard 3; MO 1.5, 2.3)	X	X	X	XX	XX	XX	X	XX	XX	XX	X	XX	XX	X	X	X	X	X	X	XX	XX	XX
d. apply inductive and deductive reasoning (NCTM Standard 3; MO 3.5)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
IV. Connections																						
By the end of grade 12, all students should know:																						
1. Problems may be looked at in more than one way.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
2. Mathematics is used in other subject areas.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
3. Mathematics is used in the real world.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
By the end of grade 12, all students should be able to:																						
a. recognize and/or derive equivalent representations for a concept (NCTM Standard 4; MO 1.6)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
b. analyze and relate procedures in multiple representations (NCTM Standard 4; MO 1.5, 3.6)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
c. relate and describe the connections within topics of mathematics and other disciplines (NCTM Standard 4; MO 1.6, 1.8, 1.10)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
d. investigate and determine the importance of mathematics in their lives, future careers, and our ever-changing global society (NCTM Standard 4; MO 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8)	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
e. evaluate the logic and aesthetics of mathematics as they relate to the universe (NCTM Standard 4; MO 1.10, 2.4)									X			XX	XX							XX	XX	XX

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V. Number Sense

By the end of grade 12, all students should know:

1. Addition, subtraction, multiplication, and division with real numbers.	XX	X	X	X	X	X	XX	X	X	X	X	X	X	X	X	X	X	X	X	XX	XX	
2. Numbers and their relationships can be represented in multiple forms.	XX	XX	XX	X	X	XX	XX	X	XX	X	X	X	XX	XX	X	XX	X	X	X	XX	XX	
3. The appropriate use of technology.	XX	X	XX	XX	XX	XX		XX		XX	XX	XX	X	XX	XX	XX	XX	X	XX		XX	
4. Data can be organized in many forms.	XX	X	XX	XX	XX	X		XX				X	XX		XX	XX	XX	XX				X

By the end of grade 12, all students should be able to:

a. develop, analyze, and explain procedures used for representing and analyzing relationships in tables, verbal rules, equations, and graphs. (NCTM Standards 5 and 6; MO 1.6, 1.8, 1.10, 2.6)			XX	XX	XX	XX	XX	X	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
b. analyze the effects of parameter changes on the graphs of functions (NCTM Standards 5 and 6; MO 1.6, 3.6, 4.1, 4.7)				XX			XX					XX			XX	X	XX					
c. analyze and describe relationships and the resulting effects between changes in independent and dependent variables. (NCTM Standards 5 and 6; MO 1.6, 3.3, 4.1)				X			XX									X	X	X	X			

VI. Geometric and Spatial Sense

By the end of grade 12, all students should know:

1. Structures of geometric and measurement systems.									XX	XX		XX	XX	X							XX		XX
2. Properties and relationships of two-and three-dimensional shapes.									XX	XX		XX	XX	XX	X								
3. Geometric shapes can be used to describe the real world.									XX	XX		XX	XX	XX	X					XX		XX	

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a. interpret and draw three-dimensional objects (NCTM Standard 7; MO 1.5, 1.9, 2.7)									X					XX	XX	X							
b. represent and solve problem situations with geometric models and apply properties of figures (NCTM Standard 7; MO 1.5, 2.7, 3.7)									XX	XX			XX	XX	XX	XX					XX		
c. classify figures in terms of congruence and similarity and apply these relationships. (NCTM Standard 7; MO 1.1, 1.4, 1.6, 3.5)										XX	XX	X	X										XX
d. deduce properties of, and relationships between, figures from given assumptions (NCTM Standard 7; MO 1.6, 1.8, 2.4, 3.5)											XX	XX	X	XX									XX
e. translate between synthetic and coordinate representations using a variety of methods and technologies (NCTM Standard 8; MO 1.4, 2.7)			XX						XX	XX			XX	XX							XX		
f. deduce properties of figures using transformations and coordinates (NCTM Standard 8; MO 2.4, 3.5)									XX	XX			XX	XX									
g. identify congruent and similar figures using transformations (NCTM Standard 8; MO 1.5, 3.5, 3.6)										X			X										
h. analyze properties of transformations and relate translations to vectors (NCTM Standard 8; MO 1.6, 2.4, 3.6, 4.1)													X										
i. apply an understanding of perimeter, area, volume, angle measure, capacity, weight and mass (NCTM Standard 7; MO 2.5, 3.3, 4.1)									XX	XX			XX	XX		XX					XX		

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j. model, describe, and analyze maximum and minimum points on a graph (NCTM Standard 13; MO 1.6, 2.1, 4.3, 4.7)								XX		XX				XX		XX						
k. model, describe, and analyze patterns of sequences through processes of geometric change, approximations, and limits (NCTM Standard 14; MO 1.6, 2.1, 4.3, 4.7)						XX															XX	
l. recognize and apply trigonometry to problem situations (NCTM Standard 9; MO 3.1, 3.6, 4.2, 4.8)										XX	X	X					XX					
VII. Data Analysis, Probability and Statistics																						
By the end of grade 12, all students should know:																						
1. Statistical measures of central tendency, randomness, variability, and correlation.	XX			XX	XX			XX				X						XX				
2. Appropriate use of theoretical and experimental probabilities.								XX										XX				
3. The process required to design and conduct a survey or experiment.								XX										XX				
4. The process required to analyze and present data.	XX			XX	XX			XX				X						XX				
5. The appropriate use of technology.	XX			XX	XX			XX				X						X				
By the end of grade 12, all students should be able to:																						
a. interpret and summarize data from charts, tables, and graphs that appear in real-world situations (NCTM Standard 10; MO 1.1, 1.8)	XX	X	X	XX	XX	X		XX			X	X	XX	X	XX	XX	XX	XX				X
b. apply curve-fitting to make defensible predictions (NCTM Standard 10; MO 1.4, 2.7, 3.2)				XX	XX											XX	XX	X				

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c. apply the appropriate statistical measures including central tendency, variability, and correlation to a situation (NCTM Standard 10; MO 1.2, 1.5, 3.2)	XX			XX	XX			XX				X						XX				
d. investigate the effects of data transformations on variability and measures of central tendency (NCTM Standard 10; MO 1.1, 1.4, 2.7)	XX																					
e. investigate the concept of a random variable (NCTM Standard 10; MO 1.4, 2.7, 3.2)																		XX				
f. design and interpret simulations to estimate probabilities (NCTM Standard 11; MO 1.3, 3.3, 3.6)								XX														
g. apply theoretical probability to real-world problems (NCTM Standard 11; MO 1.7, 3.8)								XX										XX				
h. apply experimental probability to real-world problems (NCTM Standard 11; MO 1.7, 3.8)								XX										XX				
i. collect, plot, and interpret data, including that from a discrete probability distribution (NCTM Standard 11; MO 1.2, 1.6, 3.6)	XX				X			XX				X						X				
j. develop, interpret, and apply the normal curve in problem solving (NCTM Standard 11; MO 1.1, 3.2, 3.4)																		XX				
k. determine and interpret maximum and minimum values within a data set, on a graph, or in a problem situation (NCTM Standard 13; MO 1.3, 2.1, 3.6)	XX				X			X														

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I. analyze an infinite series as it relates to a limiting value (NCTM Standard 13; MO 1.6, 1.8, 3.2)																						XX	
VIII. Patterns and Relationships																							
By the end of grade 12, all students should know:																							
1. Mathematical patterns and relationships may be represented in various forms.	X	XX	XX	XX	XX	XX	XX	X	X	X	XX	XX	XX	XX	XX	XX	XX	XX	X	X	XX	X	
2. Mathematical symbols can be used to represent real-world situations.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	
3. Definitions of sequences and series.						XX															XX		
4. Trigonometric ratios of sine, cosine, and tangent.										XX							XX						
5. Subsets of the real number system.						X														XX	XX		
By the end of grade 12, all students should be able to:																							
a. compare and contrast the real number system and its various subsystems with regard to their structural characteristics (NCTM Standard 14; MO 1.6, 1.8)																					XX	XX	
b. represent and analyze relationships using verbal rules, tables and graphs as tools to interpret expressions, equations and inequalities (NCTM Standards 5 and 6; MO 1.6, 1.8, 2.1, 3.3)		XX	XX	XX	XX	XX	XX	X	X	X	XX	XX	XX	X	XX	XX	XX	XX	X	X	XX		
c. translate among tabular, symbolic, and graphical representations of functions and model real-world phenomena with a variety of functions (NCTM Standard 6; MO 1.6, 1.8, 2.2, 3.6)		XX	XX	XX	X	XX					XX	XX	X	X	XX	XX	XX	XX	X		XX		
d. represent situations that involve variable quantities with expressions, equations and inequalities (NCTM Standard 5; MO 1.6, 1.8, 3.3)		XX	XX	XX	XX	XX	X	XX	XX	X	XX	XX	XX	XX	XX	XX	XX	XX	XX	X	XX		

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e. solve equations and inequalities (NCTM Standard 5; MO 1.6, 1.8, 2.2, 3.3)		XX	XX	XX	XX	XX	X		XX	X	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	X	XX	
f. translate between synthetic and coordinate representation for geometric relationships (NCTM Standard 8; MO 1.6, 1.8, 2.2, 3.3)			XX						XX	XX		XX	XX							XX			
g. investigate limiting processes by examining infinite sequences and series (NCTM Standard 13; MO 1.6, 1.8, 3.3)		XX					X					XX				X						XX	
h. apply trigonometry to problem situations involving triangles and explore real-world phenomena using the sine, cosine, and tangent functions (NCTM Standard 9; MO 1.6, 1.8, 2.2, 3.6)											XX	X	X					XX					
i. analyze effects of parameter changes on the graphs of functions using a variety of technologies to gather data (NCTM Standard 6; MO 1.4, 1.6, 2.7, 3.3)			XX			XX						XX			XX	X	XX						
IX. Mathematical Systems and Number Theory																							
By the end of grade 12, all students should know:																							
1. Properties of real numbers.	X	XX	XX																		XX	XX	
2. Procedures for calculator and/or computer use.	XX		XX	XX	XX	X		XX		XX		XX	X	XX	XX							XX	
3. Basic algebraic procedures.		XX	XX	XX	XX	X	X		XX	X	X	X	X	XX	XX	X	X	X	XX	XX	X		
4. Geometric relationships.									XX	XX		XX	XX		X				X				XX
By the end of grade 12, all students should be able to:																							
a. compare and contrast the real number system and its various subsystems (NCTM Standard 14; MO 2.1, 4.1)	XX	XX	XX			XX															XX	XX	

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b. select and apply appropriate technology as a problem-solving tool to achieve understanding of the logic of algebraic and geometric procedures (NCTM Standard 14; MO 1.4, 3.6)		X	XX		XX	XX				XX		XX	X	XX	XX	X	X					XX	
c. investigate and determine similarities and differences between mathematical systems (NCTM Standard 14; MO 2.1, 4.1, 4.6)		XX												XX							XX	XX	XX
d. extend understanding and application of number theory concepts (NCTM Standard 6; MO 1.6, 3.2, 3.3)		XX				X								XX							XX	XX	
X. Discrete Mathematics																							
By the end of grade 12, all students should know:																							
1. Concepts of geometry.									XX	XX		XX	XX		X				XX			XX	
2. Concepts of probability and statistics.	XX						XX										XX						
3. Characteristics of exponential growth.		XX	XX		XX											XX							
4. Cause-and-effect.						XX																	
5. Whole-to-part.	X			X			X	X	X		X						X		X	XX	X		
By the end of grade 12, all students should be able to:																							
a. explore and solve application problems involving graph theory (airline routes, circuits, paths, connecting roads, coloring a map, etc.) (NCTM Standard 12; MO 1.6, 1.8, 2.2, 3.2, 3.3, 3.6)																					XX		
b. use tree, Venn, or student-developed diagrams as problem-solving tools (NCTM Standard 12; MO 3.2, 3.3, 3.6)					XX		XX	XX									XX	XX					
c. use concepts from logic and/or truth tables to recognize valid and invalid arguments (NCTM Standard 3; MO 2.2, 3.5)												XX	XX								XX		

Correlation Key: "X" Coverage = Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. "XX" In-depth coverage = Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept.	MATH Connections 1A				MATH Connections 1B				MATH Connections 2A			MATH Connections 2B			MATH Connections 3A				MATH Connections 3B			
	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 7	Chapter 8	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 7	Chapter 8
d. explore applications from counting techniques such as Pascal's Triangle, permutations, combinations, and Fibonacci sequence (NCTM Standard 12; MO 1.6, 2.2, 3.6, 3.6)							XX	XX										XX	XX			
e. investigate the concepts of game theory* (NCTM Standard 1; MO 3.2, 3.7, 3.8) *game theory: selecting the best strategies in order to achieve the most favorable outcomes. Games are defined as have two or more players with conflicting interests.					XX		XX											X		XX		
f. explore concepts from election theory (NCTM Standard 1; MO 3.2, 3.7, 4.2, 4.3)																		X				
g. investigate different approaches to apportionment and fair division, then explore their applications (e.g., division of property in estates, apportionment in the House of Representatives) (NCTM Standard 1; MO 3.2, 3.3, 3.7, 4.3)																		X				
h. use the concept of recursion in mathematics to solve application problems (e.g., compound interest, depreciation, radium decay, maximum storage in the least amount of space, fractals) (NCTM Standard 12; MO 1.8, 2.2, 3.2, 3.7)						XX															XX	