

**FORMAT FOR CORRELATION TO THE GEORGIA PERFORMANCE STANDARDS**

**Subject Area:** Mathematics 2 **State-Funded Course:** Mathematics 2

**Textbook Title:** MathConnections: Year 2a & Year 2b

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*The GPSs for grades K-12 Science and 9-12 Mathematics may be accessed on-line at: <http://www.georgiastandards.org/>.*

<u>Standard</u> (Cite Number)	<u>Standard</u> (Cite specific standard)	<u>Where Taught</u> (If print component, cite page number; if non-print, cite appropriate location.)
<p><b>MM2N1.</b></p> <p>MM2N1.a</p> <p>MM2N1.b</p> <p>MM2N1.c</p> <p>MM2N1.d</p> <p><b>MM2A1.</b></p>	<p><b>Students will represent and operate with complex numbers.</b></p> <p>Write square roots of negative numbers in imaginary form.</p> <p>Write complex numbers in the form <math>a + bi</math>.</p> <p>Add, subtract, multiply, and divide complex numbers.</p> <p>Simplify expressions involving complex numbers.</p> <p><b>Students will investigate step and piecewise functions, including greatest integer and absolute value functions.</b></p>	

MM2A1.a	Write absolute value functions as piecewise functions.	
MM2A1.b	Investigate and explain characteristics of a variety of piecewise functions including domain, range, vertex, axis of symmetry, zeros, intercepts, extrema, points of discontinuity, intervals over which the function is constant, intervals of increase and decrease, and rates of change.	
MM2A1.c	Solve absolute value equations and inequalities analytically, graphically, and by using appropriate technology.	
<b>MM2A2.</b>	<b>Students will explore exponential functions.</b>	
MM2A2.a	Extend properties of exponents to include all integer exponents.	
MM2A2.b	Investigate and explain characteristics of exponential functions, including domain and range, asymptotes, zeros, intercepts, intervals of increase and decrease, rates of change, and end behavior.	
MM2A2.c	Graph functions as transformations of $f(x) = a^x$ .	
MM2A2.d	Solve simple exponential equations and inequalities analytically, graphically, and by using appropriate technology.	
MM2A2.e	Understand and use basic exponential functions as models of real phenomena.	

MM2A2.f	Understand and recognize geometric sequences as exponential functions with domains that are whole numbers.	
MM2A2.g	Interpret the constant ratio in a geometric sequence as the base of the associated exponential function.	
<b>MM2A3.</b>	<b>Students will analyze quadratic functions in the forms <math>f(x) = ax^2 + bx + c</math> and <math>f(x) = a(x - h)^2 + k</math>.</b>	
MM2A3.a	Convert between standard and vertex form.	
MM2A3.b	Graph quadratic functions as transformations of the function $f(x) = x^2$ .	
MM2A3.c	Investigate and explain characteristics of quadratic functions, including domain, range, vertex, axis of symmetry, zeros, intercepts, extrema, intervals of increase and decrease, and rates of change.	
MM2A3.d	Explore arithmetic series and various ways of computing their sums.	
MM2A3.e	Explore sequences of partial sums of arithmetic series as examples of quadratic functions.	

<b>MM2A4.</b>	<b>Students will solve quadratic equations and inequalities in one variable.</b>	
MM2A4.a	Solve equations graphically using appropriate technology.	
MM2A4.b	Find real and complex solutions of equations by factoring, taking square roots, and applying the quadratic formula.	
MM2A4.c	Analyze the nature of roots using technology and using the discriminant.	
MM2A4.d	Solve quadratic inequalities both graphically and algebraically, and describe the solutions using linear inequalities.	
<b>MM2A5.</b>	<b>MM2A5. Students will explore inverses of functions.</b>	
MM2A5.a	Discuss the characteristics of functions and their inverses, including one-to-oneness, domain, and range.	
MM2A5.b	Determine inverses of linear, quadratic, and power functions and functions of the form $f(x) = xa$ , including the use of restricted domains.	
MM2A5.c	Explore the graphs of functions and their inverses.	
MM2A5.d	Use composition to verify that functions are inverses of each other.	

<b>MM2G1.</b>	<b>Students will identify and use special right triangles.</b>	
MM2G1.a	Determine the lengths of sides of 30°-60°-90° triangles.	
MM2G1.b	Determine the lengths of sides of 45°-45°-90° triangles.	
<b>MM2G2.</b>	<b>Students will define and apply sine, cosine, and tangent ratios to right triangles.</b>	
MM2G2.a	Discover the relationship of the trigonometric ratios for similar triangles.	Book 2a: pp. 221 – 222, 233 – 235, 244 – 246
MM2G2.b	Explain the relationship between the trigonometric ratios of complementary angles.	Book 2a: pp. 252
MM2G2.c	Solve application problems using the trigonometric ratios.	Book 2a: pp. 227, 229, 231, 241 – 242, 244 – 248, 251 – 253, 269 – 270 Book 2b: p. 312, 313, 346, 356, 381, 406 – 408
<b>MM2G3.</b>	<b>MM2G3. Students will understand the properties of circles.</b>	
MM2G3.a	Understand and use properties of chords, tangents, and secants as an application of triangle similarity.	Book 2b: pp. 351
MM2G3.b	Understand and use properties of central, inscribed, and related angles.	Book 2b: pp. 352 – 359

MM2G3.c	Use the properties of circles to solve problems involving the length of an arc and the area of a sector.	Book 2b: pp. 339 – 350
MM2G3.d	Justify measurements and relationships in circles using geometric and algebraic properties.	Book 2b: pp. 228 – 291, 299 – 304, 308, 324 – 333, 351, 357 – 359
<b>MM2G4.</b>	<b>MM2G4. Students will find and compare the measures of spheres.</b>	
MM2G4.a	Use and apply surface area and volume of a sphere.	Book 2b: pp. 416 – 419, 421
MM2G4.b	Determine the effect on surface area and volume of changing the radius or diameter of a sphere.	
<b>MM2D1.</b>	<b>Using sample data, students will make informal inferences about population means and standard deviations.</b>	
MM2D1.a	Pose a question and collect sample data from at least two different populations.	
MM2D1.b	Understand and calculate the means and standard deviations of sets of data.	
MM2D1.c	Use means and standard deviations to compare data sets.	

MM2D1.d	Compare the means and standard deviations of random samples with the corresponding population parameters, including those population parameters for normal distributions. Observe that the different sample means vary from one sample to the next. Observe that the distribution of the sample means has less variability than the population distribution.	
<b>MM2D2.</b>	<b>Students will determine an algebraic model to quantify the association between two quantitative variables.</b>	
MM2D2.a	Gather and plot data that can be modeled with linear and quadratic functions.	Book 2b: p. 328
MM2D2.b	Examine the issues of curve fitting by finding good linear fits to data using simple methods such as the median-median line and “eyeballing.”	
MM2D2.c	Understand and apply the processes of linear and quadratic regression for curve fitting using appropriate technology.	
MM2D2.d	Investigate issues that arise when using data to explore the relationship between two variables, including confusion between correlation and causation.	
<b>MM2P1.</b>	<b>Students will solve problems (using appropriate technology).</b>	

MM2P1.a	Build new mathematical knowledge through problem solving.	Book 2a: pp. 72, 224, 228 Book 2b: pp. 314 – 320, 324 – 332, 341 – 346, 352 – 356, 373 – 377, 390 – 392, 427, 428, 431
MM2P1.b	Solve problems that arise in mathematics and in other contexts.	Book 2a: pp. 4 – 6, 14, 22, 94 – 98, 154 – 156, 166, 174 – 177, 187 – 189, 225, 235, 236 Book 2b: pp. 284 – 286, 293, 395, 398, 468 – 477, 509
MM2P1.c	Apply and adapt a variety of appropriate strategies to solve problems.	Book 2a: pp. 224, 228 Book 2b: pp. 314 – 320, 324 – 332, 341 – 346, 352 – 356, 373 – 377, 390 – 392, 427, 428, 431
MM2P1.d	Monitor and reflect on the process of mathematical problem solving.	Book 2a: pp. 77, 130, 144, 145, 182, 183, 189, 191 – 197, 201, 228, 229, 251 – 253 Book 2b: pp. 405, 417
<b>MM2P2.</b>	<b>Students will reason and evaluate mathematical arguments.</b>	
MM2P2.a	Recognize reasoning and proof as fundamental aspects of mathematics.	Book 2a: pp. 26, 31, 35, 40 – 42, 53, 68, 132, 157, 182, 183, 186, 189, 192, 193, 199, 228, 229, 237 – 239
MM2P2.b	Make and investigate mathematical conjectures.	Book 2a: pp. 224, 228 Book 2b: pp. 314 – 320, 324 – 332, 341 – 346, 352 – 356, 373 – 377, 390 – 392, 427, 428, 431
MM2P2.c	Develop and evaluate mathematical arguments and proofs.	Book 2a: pp. 26, 31, 35, 40 – 42, 53, 68, 132, 157, 182, 183, 186, 189, 192, 193, 199, 228, 229, 237 – 239
MM2P2.d	Select and use various types of reasoning and methods of proof.	Book 2a: pp. 26, 31, 35, 40 – 42, 53, 68, 132, 157, 182, 183, 186, 189, 192, 193, 199, 228, 229, 237 – 239
<b>MM2P3.</b>	<b>MM2P3. Students will communicate mathematically.</b>	

MM2P3.a	Organize and consolidate their mathematical thinking through communication.	Book 2a: pp. 72, 228
MM2P3.b	Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.	Book 2a: pp. 72, 120, 126, 186, 204 Book 2b: pp. 284, 476
MM2P3.c	Analyze and evaluate the mathematical thinking and strategies of others.	
MM2P3.d	Use the language of mathematics to express mathematical ideas precisely.	Book 2a: pp. 72, 120, 126, 186, 204 Book 2b: pp. 284, 476
<b>MM2P4.</b>	<b>MM2P4. Students will make connections among mathematical ideas and to other disciplines.</b>	
MM2P4.a	Recognize and use connections among mathematical ideas.	Book 2a: pp. 72, 88, 100 – 103, 145, 149, 168, 169, 174, 175, 180 – 182, 216, 221 Book 2b: pp. 313 – 322, 373 – 377, 397 – 400, 404, 406 – 421, 442 – 476, 486 – 492
MM2P4.b	Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	Book 2a: pp. 25, 55 – 65, 71, 72, 88, 100 – 103, 145, 149, 168, 169, 174, 175, 180 – 182, 216, 221 Book 2b: pp. 313 – 322, 373 – 377, 397 – 400, 404, 406 – 421, 442 – 476, 486 – 492
MM2P4.c	Recognize and apply mathematics in contexts outside of mathematics.	Book 2a: pp. 4 – 6, 14, 22, 94 – 98, 154 – 156, 166, 174 – 177, 187 – 189, 225, 235, 236 Book 2b: pp. 284 – 286, 293, 395, 398, 468 – 477, 509
<b>MM2P5.</b>	<b>MM2P5. Students will represent mathematics in multiple ways.</b>	

MM2P5.a	Create and use representations to organize, record, and communicate mathematical ideas.	Book 2a: pp. 62 – 65, 72, 94, 101 – 102, 127, 136, 150, 180 – 182, 187, 271 – 280 Book 2b: pp. 309 – 314, 318, 319, 328, 438 – 467, 472 – 478, 494 – 499
MM2P5.b	Select, apply, and translate among mathematical representations to solve problems.	Book 2a: pp. 44, 69, 108, 221, 237 – 239 Book 2b: pp. 370
MM2P5.c	Use representations to model and interpret physical, social, and mathematical phenomena.	Book 2a: pp. 4 – 6, 14, 22, 94 – 98, 154 – 156, 166, 174 – 177, 187 – 189, 225, 235, 236 Book 2b: pp. 284 – 286, 293, 395, 398, 468 – 477, 509
<b>MRC.</b>	<b>MRC. Students will enhance reading in all curriculum areas by:</b>	
MRC.a	<p>Reading in all curriculum areas</p> <ul style="list-style-type: none"> <li>• Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas</li> <li>• Read both informational and fictional texts in a variety of genres and modes of discourse</li> <li>• Read technical texts related to various subject areas</li> </ul>	All sections, all texts
MRC.b	<p>Discussing books</p> <ul style="list-style-type: none"> <li>• Discuss messages and themes from books in all subject areas.</li> <li>• Respond to a variety of texts in multiple modes of discourse.</li> <li>• Relate messages and themes from one subject area to messages and themes in another area.</li> <li>• Evaluate the merit of texts in every</li> </ul>	All sections, all texts

MRC.c	<p>subject discipline.</p> <ul style="list-style-type: none"> <li>• Examine author’s purpose in writing.</li> <li>• Recognize the features of disciplinary texts.</li> </ul> <p>Building vocabulary knowledge</p> <ul style="list-style-type: none"> <li>• Demonstrate an understanding of contextual vocabulary in various subjects.</li> <li>• Use content vocabulary in writing and speaking.</li> <li>• Explore understanding of new words found in subject area texts.</li> </ul>	<p>Book 2a: 9, 15,19, 24 – 25, 32, 36 – 38, 56, 91 – 95, 108, 113 –114, 157 – 161, 166  Book 2b: 283 – 292, 339- 340, 347, 352 – 353, 369, 379 – 380, 383 – 386, 398, 429 – 430</p>
MRC.d	<p>Establishing context</p> <ul style="list-style-type: none"> <li>• Explore life experiences related to subject area content.</li> <li>• Discuss in both writing and speaking how certain words are subject area related.</li> <li>• Determine strategies for finding content and contextual meaning for unknown words.</li> </ul>	<p>Book 2a: pp. 2, 16, 22, 43, 52, 135, 136, 153 – 156, 174, 175, 198, 199, 202, 207 – 210, 212, 217, 231, 252  Book 2b: pp. 283 – 286, 294, 305 – 307, 309 – 311, 323, 336, 338, 340 – 350, 355, 356, 375 – 381, 383, 390, 395, 396, 398, 407, 418, 421, 425 – 429, 435 – 437, 439, 445, 468 – 476, 482 – 485, 491, 491, 500, 501, 509 – 513, 520 – 525, 528 – 530, 532 – 535, 539 – 541</p>