

# Mathematics MCAS Preparation Curriculum

*This course is designed to provide academic support to those students who have scored 228 or below on the grade 8 MCAS. Prior to taking the grade 10 math MCAS, students will receive assistance in math and learn strategies designed to improve their test-taking skills. This course covers the Massachusetts Mathematics Curriculum Framework standards for grades 9 and 10 and provides students with the academic support necessary to succeed on the MCAS and in the classroom.*

Unit: Number Sense and Operations	
Essential Question	Can I independently, recognize, interpret, and answer questions that require a reasonable understanding of our number system in the MCAS exam?
Content/Standards	<p><b>10.N.1:</b> Identify and use the properties of operations on real numbers, including the associative, commutative, and distributive properties; the existence of the identity and inverse elements for addition and multiplication; the existence of <math>n</math>th roots of positive real numbers for any positive integer <math>n</math>; and the inverse relationship between taking the <math>n</math>th root of and the <math>n</math>th power of a positive real number.</p> <p><b>10.N.2:</b> Simplify numerical expressions, including those involving positive integer exponents or the absolute value; apply such simplifications in the solution of problems.</p> <p><b>10.N.3:</b> Find the approximate value for solutions to problems involving square roots and cube roots without the use of a calculator.</p> <p><b>10.N.4:</b> Use estimation to judge the reasonableness of results of computations and of solutions to problems involving real numbers.</p>
Resources	<ul style="list-style-type: none"> <li>• MCAS Math: Great Source Education Group (Castro)             <ul style="list-style-type: none"> <li>○ Unit 1: Lessons 1:1 – 1:4</li> </ul> </li> <li>• Previous MCAS test questions</li> <li>• Technology: Scientific calculator</li> </ul>
Assessments	Homework Assignments Quiz Sections 1:1 – 1:2 Unit Test
Timeline	16 classroom periods

Unit: Patterns, Relations and Algebra	
Essential Question	Can I independently, recognize, interpret, and answer questions that require a reasonable understanding of patterns, relations, and algebra in the MCAS exam?
Content/Standards	<p><b>10.P.1:</b> Describe, complete, extend, analyze, generalize, and create a wide variety of patterns, including iterative, recursive, linear, quadratic, and exponential functional relationships.</p> <p><b>10.P.2:</b> Demonstrate an understanding of the relationship between various representations of a line. Determine a line's slope and x- and y-intercepts from its graph or from a linear equation that represents the line. Find a linear equation describing a line from a graph or a geometric description of the line. Explain the significance of a positive, negative, zero, or undefined slope.</p> <p><b>10.P.3:</b> Add, subtract, and multiply polynomials. Divide polynomials by monomials.</p> <p><b>10.P.4:</b> Demonstrate facility in symbolic manipulation of polynomial and rational expressions by rearranging and collecting terms; factoring; identifying and canceling common factors in rational expressions; and applying the properties of positive integer exponents.</p> <p><b>10.P.5:</b> Find solutions to quadratic equations by factoring, completing the square, or using the quadratic formula. Demonstrate an understanding of the equivalence of the methods.</p> <p><b>10.P.6:</b> Solve equations and inequalities including those involving absolute value of linear expressions and apply to the solution of problems.</p> <p><b>10.P.7:</b> Solve everyday problems that can be modeled using linear, reciprocal, quadratic, or exponential functions. Apply tabular, graphical, or symbolic methods to the solution. Include compound interest, and direct and inverse variation problems. Use technology when appropriate.</p> <p><b>10.P.8:</b> Solve everyday problems that can be modeled using systems of linear equations or inequalities. Apply algebraic and graphical methods to the solution. Use technology when appropriate. Include mixture, rate, and work problems.</p>
Resources	<ul style="list-style-type: none"> <li>• MCAS Math: Great Source Education Group (Castro) <ul style="list-style-type: none"> <li>○ Unit 2: Lessons 2:1 – 2:7</li> </ul> </li> <li>• Previous MCAS test questions</li> <li>• Technology: Scientific calculator</li> </ul>
Assessments	<p>Homework Assignments</p> <p>Quiz Lessons 2:1 – 2:4</p> <p>Unit Test</p>
Timeline	24 classroom periods

Unit: Geometry	
Essential Question	Can I independently, recognize, interpret, and answer questions that require a reasonable understanding of geometry in the MCAS exam?
Content/Standards	<p><b>10.G.1:</b> Identify figures using properties of sides, angles, and diagonals. Identify the figures' type(s) of symmetry.</p> <p><b>10.G.3:</b> Recognize and solve problems involving angles formed by transversals of coplanar lines. Identify and determine the measure of central and inscribed angles and their associated minor and major arcs. Recognize and solve problems associated with radii, chords, and arcs within or on the same circle.</p> <p><b>10.G.4:</b> Apply congruence and similarity correspondences and properties of the figures to find missing parts of geometric figures, and provide logical justification.</p> <p><b>10.G.5:</b> Solve simple triangle problems using the triangle angle sum property and/or the Pythagorean Theorem.</p> <p><b>10.G.6:</b> Use the properties of special triangles to solve problems.</p> <p><b>10.G.7:</b> Using rectangular coordinates, calculate midpoints of segments, slopes of lines and segments, and distances between two points, and apply the results to the solutions of problems.</p> <p><b>10.G.8:</b> Find linear equations that represent lines either perpendicular or parallel to a given line and through a point.</p> <p><b>10.G.9:</b> Draw the results, and interpret transformations on figures in the coordinate plane. Apply transformations to the solutions of problems.</p> <p><b>10.G.10:</b> Demonstrate the ability to visualize solid objects and recognize their projections and cross sections.</p> <p><b>10.G.11:</b> Use vertex-edge graphs to model and solve problems.</p>
Resources	<ul style="list-style-type: none"> <li>• MCAS Math: Great Source Education Group (Castro) <ul style="list-style-type: none"> <li>○ Unit 3: Lessons 3:1 – 3:7, 3:9</li> </ul> </li> <li>• Previous MCAS test questions</li> <li>• Technology: Scientific calculator</li> </ul>
Assessments	<p>Homework Assignments</p> <p>Quiz Lessons 3:1 – 3:4</p> <p>Unit Test</p>
Timeline	12 classroom periods

Unit: Measurement	
Essential Question	Can I independently, recognize, interpret, and answer questions that require a reasonable understanding of measurement in the MCAS exam?
Content/Standards	<p><b>10.M.1:</b> Calculate perimeter, circumference, and area of common geometric figures such as parallelograms, trapezoids, circles, and triangles.</p> <p><b>10.M.2:</b> Given the formula, find the lateral area, surface area, and volume of prisms, pyramids, spheres, cylinders, and cones.</p> <p><b>10.M.3:</b> Relate changes in the measurement of one attribute of an object to changes in other attributes.</p> <p><b>10.M.4:</b> Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements.</p>
Resources	<ul style="list-style-type: none"> <li>• MCAS Math: Great Source Education Group (Castro) <ul style="list-style-type: none"> <li>○ Unit 4: Lessons 4:1 – 4:5</li> </ul> </li> <li>• Previous MCAS test questions</li> <li>• Technology: Scientific calculator</li> </ul>
Assessments	<p>Homework Assignments</p> <p>Quiz Lessons 4:1 – 4:3</p> <p>Unit Test</p>
Timeline	12 classroom periods

Unit: Data Analysis, Statistics, and Probability	
Essential Question	Can I independently, recognize, interpret, and answer questions that require a reasonable understanding of data analysis, statistics, and probability in the MCAS exam?
Content/Standards	<p><b>10.D.1:</b> Select, create, and interpret an appropriate graphical representation for a set of data and use appropriate statistics to communicate information about the data. Use these notions to compare different sets of data.</p> <p><b>10.D.2:</b> Approximate a line of best fit given a set of data. Use technology when appropriate.</p> <p><b>10.D.3:</b> Describe and explain how the relative sizes of a sample and the population affect the validity of predictions from a set of data.</p>
Resources	<ul style="list-style-type: none"> <li>• MCAS Math: Great Source Education Group (Castro) <ul style="list-style-type: none"> <li>○ Unit 5: Lessons 5:1 – 5:3, 5:5 – 5:6</li> </ul> </li> <li>• Previous MCAS test questions</li> <li>• Technology: Scientific calculator</li> </ul>
Assessments	<p>Homework Assignments</p> <p>Quiz Lessons 5:1 – 5:3</p> <p>Unit Test</p> <p>MCAS Practice Test</p>
Timeline	16 classroom periods

Unit: Real Life Applications	
Essential Question	How does what I learned this year help me in real life?
Content/Standards	<p>Content:</p> <ul style="list-style-type: none"> <li>• Real life applications such as purchasing a car, renting an apartment, and statistics applications.</li> </ul> <p>Standards:</p> <ul style="list-style-type: none"> <li>• All standards listed above</li> </ul>
Resources	Media (e.g. Newspapers, Magazines, etc.)
Assessments	Individual Project
Timeline	10 classroom periods