

**Standard for K-12 : [MACC.K12.MP.5.1](#) Use appropriate tools strategically.** Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, **a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software.** Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. **Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.**

**PLEASE NOTE: The lists of resources are not all inclusive. There are many more resources, especially on CPALMS for you to investigate!**

Grade	Critical Areas	Resources
Sixth	<p>Instructional time should focus on three critical areas:</p> <ol style="list-style-type: none"> <li>(1) Connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems</li> <li>(2) Completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers</li> <li>(3) Writing, interpreting and using expressions and equations</li> <li>(4) Developing understanding of statistical thinking</li> </ol>	<ul style="list-style-type: none"> <li>• Big Ideas Math <a href="http://www.bigideasmath.com/">http://www.bigideasmath.com/</a></li> <li>• Math Landing <a href="http://mathlanding.org/">http://mathlanding.org/</a></li> <li>• Kahn Academy <a href="https://www.khanacademy.org/commoncore/map">https://www.khanacademy.org/commoncore/map</a></li> <li>• <a href="#">CPALMS Advanced Data Grapher</a> This is an online graphing utility that is a great supplement to any lesson on graphing box plots, bubble graphs, scatterplots, histograms, and stem-and-leaf plots.</li> <li>• <a href="#">CPALMS 8th Grade Virtual Manipulatives</a> This online tool provides multiple resources for grades K - 8 to help support learning math concepts with manipulatives. The user can select the grade level, background for the work mat, and the type of manipulative to use. There is also a print screen feature to print the various work mats you create.</li> <li>• <a href="#">CPALMS Simple Equations</a> Khan Academy Video Tutorial. Introduction to basic algebraic equations of the form <math>Ax=B</math></li> </ul>

<p><b>Seventh</b></p>	<p>Instructional time should focus on four critical areas:</p> <ol style="list-style-type: none"> <li>(1) Developing understanding of and applying proportional relationships</li> <li>(2) Developing understanding of operations with rational numbers and working with expressions and linear equations</li> <li>(3) Solving problems involving scale drawings and information geometric constructions and working with two- and three-dimensional shapes to solve problems involving area, surface area and volume</li> <li>(4) Drawing inferences about populations based on samples</li> </ol>	<ul style="list-style-type: none"> <li>• Big Ideas Math <a href="http://www.bigideasmath.com/">http://www.bigideasmath.com/</a></li> <li>• Math Landing <a href="http://mathlanding.org/">http://mathlanding.org/</a></li> <li>• Kahn Academy <a href="https://www.khanacademy.org/commoncore/map">https://www.khanacademy.org/commoncore/map</a></li> <li>• <a href="#">CPALMS Transformations Using Technology</a> The teacher can introduce the website and demonstrate the use of commands to translate, rotate, or reflect. A series of transformations can be explored to result in a specified final image. Students can then access the site and use the tool to explore transformations.</li> <li>• <a href="#">CPALMS K- 8th Grade Virtual Manipulatives</a> This online tool provides multiple resources for grades K - 8 to help support learning math concepts with manipulatives. The user can select the grade level, background for the work mat, and the type of manipulative to use. There is also a print screen feature to print the various work mats you create.</li> </ul>
<p><b>Eighth</b></p>	<p>Instructional time should focus on three critical areas:</p> <ol style="list-style-type: none"> <li>(1) Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation and solving linear equations and systems of linear equations</li> <li>(2) Grasping the concept of a function and using functions to describe quantitative relationships</li> <li>(3) Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem</li> </ol>	<ul style="list-style-type: none"> <li>• Big Ideas Math <a href="http://www.bigideasmath.com/">http://www.bigideasmath.com/</a></li> <li>• Math Landing <a href="http://mathlanding.org/">http://mathlanding.org/</a></li> <li>• Kahn Academy <a href="https://www.khanacademy.org/commoncore/map">https://www.khanacademy.org/commoncore/map</a></li> <li>• <a href="#">CPALMS Exploring Systems of Equations using Graphing Calculators</a> This lesson plan introduces the concept of graphing a system of linear equations. Students will use graphing technology to explore the meaning of the solution of a linear system including solutions that correspond to intersecting lines, parallel lines, and coinciding lines.</li> <li>• <a href="#">CPALMS K-8th Grade Virtual Manipulatives</a> This online tool provides multiple resources for grades K - 8 to help support learning math concepts with manipulatives. The user can select the grade level, background for the work mat, and the type of manipulative to use. There is also a print screen feature to print the various work mats you create.</li> </ul>

<p><b>Ninth-Twelfth</b></p>	<p><a href="#">MACC.912.A-REI.3.9</a> Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).</p>	
<p><b>Algebra 1</b></p>	<p>Instructional time should focus on four critical areas:</p> <ul style="list-style-type: none"> <li>(1) Seeing structure in expressions</li> <li>(2) Arithmetic with polynomials and rational functions</li> <li>(3) Creating equations</li> <li>(4) Reasoning with equations and inequalities</li> </ul>	<ul style="list-style-type: none"> <li>• Holt McDougal Florida Larson Algebra 1 textbook support <a href="http://my.hrw.com/">http://my.hrw.com/</a></li> <li>• Algebra Nation <a href="http://www.algebration.com/">http://www.algebration.com/</a></li> <li>• eMathematics <a href="http://www.emathematics.net/">http://www.emathematics.net/</a></li> <li>• Inside Math <a href="http://www.insidemathematics.org/index.php/tools-for-teachers">http://www.insidemathematics.org/index.php/tools-for-teachers</a></li> <li>• Khan Academy <a href="https://www.khanacademy.org/commoncore/map">https://www.khanacademy.org/commoncore/map</a></li> <li>• SAS Curriculum Pathways <a href="http://www.sascurriculumpathways.com">http://www.sascurriculumpathways.com</a></li> <li>• Virtual Nerd <a href="http://www.virtualnerd.com/">http://www.virtualnerd.com/</a></li> <li>• <a href="#">CPALMS Tina's Triangle</a> In this task students investigate and ultimately prove the validity of the method of generating Pythagorean Triples that involves the polynomial identity <math>(x^2+y^2)^2=(x^2-y^2)^2+(2xy)^2</math>.</li> <li>• <a href="#">CPALMS Curve Fitting</a> The students will plot points on a graph and watch as a polynomial is made.</li> <li>• <a href="#">CPALMS Equation Math</a> Those crazy ancient mathematicians are back. In this online game, students find the matching pairs by solving equations to find the value of x in each equation. Correct answers reveal a hidden picture. Levels 1 and 2 are most appropriate for Grades 6-7 Level 3 is most appropriate for Grade 8</li> </ul>

<p><b>Geometry</b></p>	<p>Instructional time should focus on six critical areas:</p> <ul style="list-style-type: none"> <li>(1) Congruence</li> <li>(2) Similarity, right triangles and trigonometry</li> <li>(3) Circles</li> <li>(4) Expressing geometric properties with equations</li> <li>(5) Geometric measurement and dimension</li> <li>(6) Modeling with Geometry</li> </ul>	<ul style="list-style-type: none"> <li>• Holt McDougal Florida Larson Geometry <a href="http://my.hrw.com/">http://my.hrw.com/</a></li> <li>• Inside Math <a href="http://www.insidemathematics.org/index.php/tools-for-teachers">http://www.insidemathematics.org/index.php/tools-for-teachers</a></li> <li>• Khan Academy <a href="https://www.khanacademy.org/commoncore/map">https://www.khanacademy.org/commoncore/map</a></li> <li>• SAS Curriculum Pathways <a href="http://www.sascurriculumpathways.com">http://www.sascurriculumpathways.com</a></li> <li>• eMathematics <a href="http://www.emathematics.net/">http://www.emathematics.net/</a></li> <li>• Virtual Nerd <a href="http://www.virtualnerd.com/">http://www.virtualnerd.com/</a></li> <li>• <a href="#">CPALMS Right Triangle Calculator</a>                      "Free online calculator will calculate the side lengths and angles for any <a href="#">right triangle</a>. Just input any valid combination of sides and/or angles, and let the calculator do the rest! This free tool also draws a downloadable image of your triangle."</li> </ul>
<p><b>Algebra 2</b></p>	<p>Instructional time should focus on four critical areas:</p> <ul style="list-style-type: none"> <li>(1) Numbers and quantity</li> <li>(2) Algebra</li> <li>(3) Functions</li> <li>(4) Statistics and probability</li> </ul>	<ul style="list-style-type: none"> <li>• Holt McDougal Florida Larson Algebra 2 textbook support <a href="http://my.hrw.com/">http://my.hrw.com/</a></li> <li>• Inside Math <a href="http://www.insidemathematics.org/index.php/tools-for-teachers">http://www.insidemathematics.org/index.php/tools-for-teachers</a></li> <li>• Khan Academy <a href="https://www.khanacademy.org/commoncore/map">https://www.khanacademy.org/commoncore/map</a></li> <li>• eMathematics <a href="http://www.emathematics.net/">http://www.emathematics.net/</a></li> <li>• SAS Curriculum Pathways <a href="http://www.sascurriculumpathways.com">http://www.sascurriculumpathways.com</a></li> <li>• Virtual Nerd <a href="http://www.virtualnerd.com/">http://www.virtualnerd.com/</a></li> </ul>