

**Los Angeles Unified School District**  
**Office of Curriculum, Instruction and School Support**

**COURSE DESCRIPTION**

Common Core Math 8 Tutorial Lab is designed to provide foundational knowledge and intervention for students taking CC Math 8 and for students who are preparing to be enrolled in Math 8. The course is also used to provide intervention for the students who are enrolled in CC Math 8 but are experiencing difficulty in mastering the core standards and academic language of CC Math 8. Common Core Math 8 Tutorial Lab is an elective mathematics course provided to students as a second course to support the core CC Math 8 course. The course is designed to enhance the student's knowledge of prerequisite skills and academic language that are needed to access the standards-based CC Math 8 course.

**COURSE SYLLABUS**

Students enrolled in this *intervention course* need **to be assessed** in an ongoing basis to determine their needs for support and intervention. Teachers are encouraged to tailor instruction through ongoing assessment to provide true differentiated instruction. The outcome of the initial and ongoing assessments are analyze to identify skill and concept requirements necessary for any Common Core State Standard, compare those requirements to the student's existing skill set, and analyze any potential student deficits.

The aim of the intervention in CC Math 8 is to provide explicit, systematic, intensive instruction for at-risk populations. As teachers strive to assist struggling students to reach the Common Core State Standards expectations, they must be able to accurately identify areas of student deficit and to match any student to an appropriate academic intervention plan. The idea of the CC Math 8 intervention is to create evidence-based intervention plans that customized to individual students and that are tied to specific Common Core Standards.

According to the California CCSS Mathematics Framework (November, 2013),

“Universal Access in education is a concept which utilizes strategies for planning for the widest variety of learners from the beginning of the lesson design and not “added on” as an afterthought. Universal Access is not a set of curriculum materials or specific time set aside for additional assistance but rather a schema. For students to benefit from universal access, teachers may need assistance in planning instruction, differentiating curriculum, infusing Specially Designed Academic Instruction in English (SDAIE) techniques, using the California English Language Development Standards (CA ELD standards), and using grouping strategies effectively.”

Therefore, through careful planning for modifying curriculum, instruction, grouping, and assessment techniques, teachers can be well prepared to adapt instruction to meet the needs of diverse learners in their classrooms.

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Office of Curriculum, Instruction and School Support**

**RATIONALE FOR SELECTED STANDARDS TO SUPPORT CC MATH 8**

Standards selected for this course were based on the prerequisite standards needed to master Common Core Standards for 8th Grade Math. All of the Common Core Standards for 8th Grade Math listed in LAUSD curriculum map were analyzed. Standards were chosen from 4th, 5th, 6th and 7th grade Common Core standards that are prerequisites to the standards in Common Core 8th Grade Math as referenced by the wire diagram from Jason Zimba. By teaching these standards students will learn and reinforce math knowledge that supports standards taught in Common Core Math 8. The objective is to support students transitioning from California Standards to Common Core and help ensure success in the Common Core 8th Grade Math.

**Multi-tier Mathematics Interventions**

Gersten et. al. (2009) in the Practice Guide "[Assisting Students Struggling with Mathematics: RtI for Elementary and Middle School](#)" presented evidence for the effectiveness of combinations of systematic and explicit instruction that include teacher demonstrations and think alouds early in the lesson, unit, or module; student verbalization of how a problem was solved; scaffolded practice; and immediate corrective feedback. In instruction that is systematic, concepts are introduced in a logical, coherent order and students have many opportunities to apply each concept. Below are the recommendations (Recommendations 3 and 4 received strong evidence rating).

**Recommendation 1.** Screen all students to identify those at risk for potential mathematics difficulties and provide interventions to students identified as at risk. *It is suggested that you use any of the following instruments to screen students: MDTP, Scholastic Math Inventory, Easy CMB, etc.*

**Recommendation 2.** Instructional materials for students receiving interventions should focus intensely on in-depth treatment of whole numbers in kindergarten through grade 5 and on rational numbers in grades 4 through 8. These materials should be selected by committee.

**Recommendation 3.** Instruction during the intervention should be explicit and systematic. This includes providing models of proficient problem solving, verbalization of thought processes, guided practice, corrective feedback, and frequent cumulative review.

**Recommendation 4.** Interventions should include instruction on solving word problems that is based on common underlying structures. *Teachers may consider using some of the strategies in "[Improving Mathematical Problem Solving in Grades 4 Through 8](#)" in teaching students problem solving.*

**Recommendation 5.** Intervention materials should include opportunities for students to work with visual representations of mathematical ideas and interventionists should be proficient in the use of visual representations of mathematical ideas.

**Recommendation 6.** Interventions at all grade levels should devote about 10 minutes in each session to building fluent retrieval of basic arithmetic facts.

**Recommendation 7.** Monitor the progress of students receiving supplemental instruction and other students who are at risk.

**Los Angeles Unified School District  
Office of Curriculum, Instruction and School Support**

Concepts/Clusters	Standards to Support Math 8	Unit	Resources / Strategies
Understand and apply the Pythagorean Theorem.	<p><b>6.G.3</b> Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.</p> <p>7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</p>	1	<ol style="list-style-type: none"> <li>1. Technology to show visual representations of geometric figures: Geometry sketchpad</li> <li>2. Use visuals to illustrate multiple representations of rate of change</li> <li>3. 7.G.6 Estimations and Approximations: The Money Munchers <a href="http://map.mathshell.org/materials/lessons.php?taskid=220#task220">http://map.mathshell.org/materials/lessons.php?taskid=220#task220</a></li> </ol>
Know that there are numbers that are not rational, and approximate them by rational numbers.	<p><b>7.NS.2d</b> Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</p>	1	<ol style="list-style-type: none"> <li>1. Number line model for operation with integers</li> <li>2. Use of chips model (positive/negative numbers) for creating 0-pairs.</li> <li>3. Use a foldable for integer rules.</li> </ol>
Work with radicals and integer exponents.	<p><b>4.OA.2</b> Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.</p> <p><b>5.NBT.2</b> Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain</p>	1	<ol style="list-style-type: none"> <li>1. Teachers are strongly encouraged to use algebra tiles or “Hands On Equations”© as students are developing a connection from concrete mathematical representations to abstract notions of variables.</li> <li>2. Spreadsheets are a powerful tool to help students understand the concept of variable because you can use formulas that are dependent on the values in a cell and then change the value in the cell. It is very easy for students to see how changing the value of the variable affects the value of the cell with the formula.</li> <li>3. 6. EE Distance to School:</li> </ol>

**Los Angeles Unified School District  
Office of Curriculum, Instruction and School Support**

Concepts/Clusters	Standards to Support Math 8	Unit	Resources / Strategies
	<p>patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.</p> <p><b>6.EE.1</b> Write and evaluate numerical expressions involving whole-number exponents.</p> <p><b>6.EE.5</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>7.EE.3</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. <i>For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the</i></p>		<p><a href="http://www.illustrativemathematics.org/illustrations/540">http://www.illustrativemathematics.org/illustrations/540</a></p> <p>4. 6.EE Rectangle Perimeter 1: <a href="http://www.illustrativemathematics.org/illustrations/421">http://www.illustrativemathematics.org/illustrations/421</a></p> <p>5. 6.EE Equivalent Expressions: <a href="http://www.illustrativemathematics.org/illustrations/542">http://www.illustrativemathematics.org/illustrations/542</a></p> <p>6. 6.EE Rectangle Perimeter 2: <a href="http://www.illustrativemathematics.org/illustrations/461">http://www.illustrativemathematics.org/illustrations/461</a></p> <p>7. 6.EE Log Ride: <a href="http://www.illustrativemathematics.org/illustrations/673">http://www.illustrativemathematics.org/illustrations/673</a></p> <p>8. 6.EE Morning Walk: <a href="http://www.illustrativemathematics.org/illustrations/1107">http://www.illustrativemathematics.org/illustrations/1107</a></p> <p>9. 6.EE Fishing Adventures 1: <a href="http://www.illustrativemathematics.org/illustrations/642">http://www.illustrativemathematics.org/illustrations/642</a></p> <p>10. Number line model for operation with integers</p> <p>11. Use of chips model (positive/negative numbers) for creating 0-pairs.</p> <p>12. Use a foldable for integer rules.</p> <p>13. 7.NS.3 Comparing Freezing Points <a href="http://www.illustrativemathematics.org/illustrations/314">http://www.illustrativemathematics.org/illustrations/314</a></p> <p>14. 7.NS.3 Operations on the number line <a href="http://www.illustrativemathematics.org/illustrations/46">http://www.illustrativemathematics.org/illustrations/46</a></p>

**Los Angeles Unified School District  
Office of Curriculum, Instruction and School Support**

Concepts/Clusters	Standards to Support Math 8	Unit	Resources / Strategies
	<p><i>center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.</i></p> <p><b>7.NS.3</b> Solve real-world and mathematical problems involving the four operations with rational numbers.</p>		
Concepts/Clusters	Standards to Support Math 8	Unit	Resources / Strategies
Understand the connections between proportional relationships, lines and linear equations.	<p><b>7.RP.2</b> Recognize and represent proportional relationships between quantities.</p> <p>a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>c. Represent proportional relationships by equations. For example, if total cost <math>t</math> is proportional to the number <math>n</math> of items purchased at a constant price <math>p</math>, the relationship between the total cost and the number of items can be expressed as <math>t = pn</math>.</p> <p>d. Explain what a point <math>(x, y)</math> on the graph of a proportional relationship means in terms of</p>	2	<ol style="list-style-type: none"> <li>1. Use ratio tables, graphing calculator, connecting graphs, tables and the use of the four fold method</li> <li>2. 7.RP.2 Music Companies, Variations 1 <a href="http://illustrativemathematics.org/illustrations/95">http://illustrativemathematics.org/illustrations/95</a></li> <li>3. National Library of Virtual Manipulatives <a href="http://nlvm.usu.edu/en/nav/grade_g_3.html">http://nlvm.usu.edu/en/nav/grade_g_3.html</a></li> <li>4. 7.G.1 Floor Plan <a href="http://illustrativemathematics.org/illustrations/107">http://illustrativemathematics.org/illustrations/107</a></li> <li>5. Real-world connections (e.g. Use grocery store ads to find unit rates for various products)</li> <li>6. Structured instructional conversations (Think-Pair-Share)</li> <li>7. Peer Tutoring</li> <li>8. Journal writing prompts (link)</li> <li>9. Use visuals to illustrate multiple representations of rate of</li> </ol>

**Los Angeles Unified School District  
Office of Curriculum, Instruction and School Support**

Concepts/Clusters	Standards to Support Math 8	Unit	Resources / Strategies
	<p>the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.</p> <p><b>7.G.1</b> Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</p>		<p>change</p>
<p>Analyze and solve linear equations and pairs of simultaneous linear equations.</p>	<p><b>6.EE.5</b> Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p><b>7.EE.1</b> Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients</p> <p><b>7.EE.4</b> Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</p> <p>a. Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where p, q, and r are specific rational numbers. Solve equations of these forms fluently.</p>	<p>2</p>	<ol style="list-style-type: none"> <li>1. 6.EE Equivalent Expressions <a href="http://www.illustrativemathematics.org/illustrations/542">http://www.illustrativemathematics.org/illustrations/542</a></li> <li>2. 7.EE.A Equivalent Expressions <a href="http://illustrativemathematics.org/illustrations/543">http://illustrativemathematics.org/illustrations/543</a></li> <li>3. 7.EE.B Guess my Number <a href="http://illustrativemathematics.org/illustrations/712">http://illustrativemathematics.org/illustrations/712</a></li> <li>4. Real world questions (use equations to set up a home budget, e.g. % of take-home pay for rent, utilities, food, savings, etc.)</li> <li>5. Structured instructional conversations (Think-Pair- Share)</li> <li>6. Peer Tutoring</li> <li>7. Journal writing prompts - <a href="http://futureofmath.misterteacher.com/Writing%20Prompts.pdf">http://futureofmath.misterteacher.com/Writing%20Prompts.pdf</a> (link)</li> <li>8. Questioning Strategies - <a href="http://www.utdanacenter.org/mathtoolkit/support/questioning.php">http://www.utdanacenter.org/mathtoolkit/support/questioning.php</a>;</li> </ol>

**Los Angeles Unified School District  
Office of Curriculum, Instruction and School Support**

Concepts/Clusters	Standards to Support Math 8	Unit	Resources / Strategies
	Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?		
Concepts/Clusters	Standards to Support Math 8	Unit	Resources / Strategies
Apply and extend previous understandings of numbers to the system of rational numbers.	<b>7.RP.2</b> Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. <i>For example, if total cost <math>t</math> is proportional to the number <math>n</math> of items purchased at a constant price <math>p</math>, the relationship between the total cost and the number of items can be expressed as <math>t = pn</math>.</i> d. Explain what a point $(x, y)$ on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where $r$ is the unit rate.	3	<ol style="list-style-type: none"> <li>1. Real-world connections (e.g. Use grocery store ads to find unit rates for various products)</li> <li>2. Structured instructional conversations (Think-Pair-Share)</li> <li>3. Peer Tutoring</li> <li>4. Journal writing prompts (link)</li> <li>5. Use visuals to illustrate multiple representations of rate of change</li> <li>6. 7.RP.2 Music Companies, Variations 1 <a href="http://illustrativemathematics.org/illustrations/95">http://illustrativemathematics.org/illustrations/95</a></li> <li>7. <a href="http://www.arcademickillbuilders.com/games/ratio-blaster/ratio-blaster.html">http://www.arcademickillbuilders.com/games/ratio-blaster/ratio-blaster.html</a></li> </ol>
Apply and extend previous understandings of numbers to the system of rational	<b>6.NS.8</b> Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first	3	<ol style="list-style-type: none"> <li>1. Use of number line</li> <li>2. Use of human graph</li> <li>3. Using common denominators to divide fractions</li> </ol>

**Los Angeles Unified School District  
Office of Curriculum, Instruction and School Support**

Concepts/Clusters	Standards to Support Math 8	Unit	Resources / Strategies
numbers.	coordinate or the same second coordinate. $+ y^2$ ).		4. Journal / Quick Write Prompts  5. 6.NS Cup of Rice <a href="http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/463/original/illustrative_mathematics_463.pdf?1343856961">http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/463/original/illustrative_mathematics_463.pdf?1343856961</a>  6. 6.NS Dan's Division Strategy <a href="http://www.illustrativemathematics.org/illustration_pdfs/330.pdf">http://www.illustrativemathematics.org/illustration_pdfs/330.pdf</a>  7. 6.NS Interpreting a Division Computation <a href="http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/270/original/illustrative_mathematics_270.pdf?1343856975">http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/270/original/illustrative_mathematics_270.pdf?1343856975</a>
Concepts/Clusters	Standards to Support Math 8	Unit	Resources / Strategies
Understand congruence and similarity using physical models, transparencies, or geometry software.	<p><b>6.G.3</b> Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.</p> <p><b>7.G.2</b> Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</p> <p><b>7.G.5</b> Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve</p>	4	<ol style="list-style-type: none"> <li>1. Technology to show visual representations of geometric figures: Geometry sketchpad</li> <li>2. National Library of Virtual Manipulatives <a href="http://nlvm.usu.edu/en/nav/grade_g_3.html">http://nlvm.usu.edu/en/nav/grade_g_3.html</a></li> <li>3. Journal writing prompts (link)</li> <li>4. Use visuals to illustrate multiple representations of rate of change</li> <li>5. Real-world connections</li> <li>6. Structured instructional conversations (Think-Pair-Share)</li> </ol>

**Los Angeles Unified School District  
Office of Curriculum, Instruction and School Support**

Concepts/Clusters	Standards to Support Math 8	Unit	Resources / Strategies
	simple equations for an unknown angle in a figure		

Mathematical Practices	Implementing Mathematical Practices
<ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason Abstractly and quantitatively</li> <li>3. Construct Viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics</li> <li>5. Use appropriate tools strategically</li> <li>6. Attend to precision</li> <li>7. Look for and make use of structure</li> <li>8. Look for and express regularity.</li> </ol>	<p>As you begin the year, it is advised that you start with MP1 and MP 3 to set up your expectations of your classroom. This will help you and your students become proficient in the use of these practices. All other practices may be evident based on tasks and classroom activities.</p>
Strategies for Implementing Math Practices	Guiding Questions:
<p>This example is an illustration of how mathematical practice standards can be exemplified in instruction.</p> <p><b>Example:</b> Compare the scenarios below to determine which represents a greater speed. Include a description of each scenario that discusses unit rates in your explanation.</p> <p><b>Scenario 2:</b> The equation for the distance <math>y</math> in miles as a function of the time <math>x</math> in hours is: <math>y=55x</math></p>	<p>MP1:</p> <ol style="list-style-type: none"> <li>1. How could you describe what you are trying to find?</li> <li>2. What do you notice about speed?</li> <li>3. What information is given in the problem?</li> <li>4. Describe the relationship between the quantities?</li> <li>5. Describe what you have already tried?</li> </ol> <p>MP3:</p> <ol style="list-style-type: none"> <li>1. What mathematical evidence supports your solution?</li> <li>2. How can you compare which relationship has greater speed?</li> <li>3. How did you test whether your approach worked?</li> <li>4. What is the same and what is different about the scenarios?</li> </ol>

**Los Angeles Unified School District  
Office of Curriculum, Instruction and School Support**

Scenario 1: Travel Time		Think-Ink-Share
<p>The graph shows a linear relationship between time and distance. The y-axis represents distance in miles, and the x-axis represents time in hours. A blue line starts at the origin (0,0) and passes through the points (1, 60) and (4, 240).</p>	<p>Give students a structure for sharing their solutions and providing sentence starters to guide accountable talk.</p> <p>I think the best way to solve this is.....</p> <p>I would not solve it this way because.....</p> <p>I agree/disagree because.....</p> <p>I don't think that will work because.....</p> <p>Let me show you what I am thinking with a .....</p> <p>I try.....I think.....will happen</p> <p>I solve the problem like this because.....</p>	

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**Los Angeles Unified School District  
Office of Curriculum, Instruction and School Support**

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a. Wire Diagram by Jason Zimba

