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

COURSE DESCRIPTION

Common Core Math 7 Tutorial Lab is designed to provide foundational knowledge and intervention for students enrolled in or preparing to enroll in *Common Core Math 7*. This course serves not only as intervention, but also as support for students experiencing difficulty in mastering the core standards and academic language constraints of the *Common Core Math 7* course. *Common Core Math 7 Tutorial Lab* is an elective mathematics course provided to students as a supplemental course to enhance the student's knowledge of prerequisite skills and academic language that is required in order to successfully access the standards-based *Common Core Math 7* course.

COURSE SYLLABUS

The structure of this course is divided into four separate, but coherent, units mirroring the *Common Core Math 7* course. Additionally, **an immense element of this intervention course is an emphasis on student engagement with the Standards for Mathematical Practice on a daily basis.** Students enrolled in this intervention course **need to be assessed** on an ongoing basis to determine their needs for support and intervention. Teachers are encouraged to adapt their instruction through ongoing formative assessments to provide genuine, differentiated instruction. The outcome of the initial and ongoing assessments are to analyze and identify key skills and concepts required for students to access the Common Core State Standards, compare those requirements to the student's existing skill set, and analyze any potential student deficits.

The goal of this intervention course is to support *Common Core Math 7* and to provide explicit, systematic, and 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 match students to an appropriate academic intervention plan. An expectation from the *Common Core Math 7 Tutorial Lab* is to create evidence-based intervention plans that are customized to individual students, and that are also 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 are well prepared to adapt instruction to meet the needs of diverse learners in their classrooms.

RATIONALE FOR SELECTED STANDARDS TO SUPPORT CC MATH 7

In analyzing the 7th Grade Common Core State Standards listed in the LAUSD Curriculum Maps, the standards that were selected for this course are based on prerequisite standards needed to successfully master the Common Core State Standards for 7th Grade mathematics. The objective is to support students transitioning from the 1997 California Content Standards to the Common Core State Standards and to help ensure success in CC Math 7.

Standards that have been added to the 7th grade with this transition to Common Core includes: constant of proportionality, factoring to create equivalent expressions, triangle side lengths, area and circumference of circles, complementary, supplementary, and vertical angles, surface area and volume of pyramids, and probability.

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.

Unit 1 **Understanding and Applying Proportional Relationships**		
Concepts/Clusters	**Prerequisite Standards to Support CC Math 7**	**Suggested Resources**
Analyze proportional relationships and use them to solve real-world and mathematical problems.	**6.RP.1:** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."* **6.RP.2:** Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."* **6.RP.3:** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the	1. ***Inside Mathematics:*** Truffles http://www.insidemathematics.org/assets/common-core-math-tasks/truffles.pdf 2. ***Illustrative Math:*** Games at Recess https://www.illustrativemathematics.org/illustrations/76 3. ***Illustrative Mathematics:*** Friends Meeting on Bicycles https://www.illustrativemathematics.org/illustrations/137 4. ***Mathematics Assessment Project:*** Sharing Costs: Riding to School http://map.mathshell.org/materials/lessons.php?taskid=489&subpage=problem) 5. ***Dan Meyer:*** Leaky Faucet http://threeacts.mrmeyer.com/leakyfaucet/ 6. ***Dan Meyer:*** Nana's Chocolate Milk http://threeacts.mrmeyer.com/nana/ 7. ***Dan Meyer:*** Coke vs Sprite http://mrmeyer.com/threeacts/cokevsprite/ 8. ***Dan Meyer:*** Shower vs Bath http://mrmeyer.com/threeacts/showervbath/

Concepts/Clusters	Prerequisite Standards to Support CC Math 7	Suggested Resources
	tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?* c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	9. ***Dan Meyer:*** Sugar Packets http://threeacts.mrmeyer.com/sugarpackets/ 10. ***Dan Meyer:*** Super Bear http://mrmeyer.com/threeacts/superbear/ 11. ***Dan Meyer:*** What light looks like http://mrmeyer.com/threeacts/speedoflight/ 12. ***Dan Meyer:*** Print Job http://mrmeyer.com/threeacts/printjob/ 13. ***Dan Meyer*:** Incredible Shrinking dollar http://mrmeyer.com/threeacts/shrinkingdollar/
Examples of Essential Questions for Unit 1		**Standards for Mathematical Practice**
1. Why might we use ratios to describe relationships between two quantities? 2. How might a ratio be different than a fraction? 3. Why is rate different from ratio? 4. What strategies might you apply to solve real-world problems involving ratios? 5. Why do we use unit rates? 6. Why is a unit rate important to solving problems? 7. Why are proportional relationships important in mathematics? 8. In what ways might we represent proportional relationships? 9. Why might using a graph to represent proportional relationships		1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.

Concepts/Clusters	Prerequisite Standards to Support CC Math 7	Suggested Resources
be useful? 10. Why is it important to understand computations with ratios, rates, and percent?		

Performance Objectives for Unit 1 *Students will grow in their ability to:*	*Guiding Questions for Implementing Standards for Mathematical Practices #1 and #2
1. Know that ratios are the comparison of two quantities 2. Describe a ratio relationship between two quantities using precise academic language 3. Know that order is important when comparing ratios in ratio notation 4. Write quantities in ratio notation, such as *a* to *b*; a:b; and a/b 5. Identify unit rate 6. Calculate unit rate 7. Analyze and articulate the difference between a ratio and a unit rate 8. Make a table of equivalent ratios with whole numbers 9. Find the missing values in a table of equivalent ratios 10. Solve real world problems using the concept of unit rate 11. Know that a percent is a ratio of a number to 100	1. How might you describe this problem in your own words? 2. What are some other problems that are similar to this problem? 3. What do you notice about …? 4. What information is given in the problem? 5. Share with me the steps you've used up to this point. 6. What are some other strategies you might try? 7. Which steps in the process are you confident about? 8. Describe what you have already tried. What might you change? 9. Describe the relationship between the two figures. 10. How is … related to …? 11. What is the relationship between … and …? 12. What properties might we use to find a solution? 13. How did you come to the decision that you needed to use …? 14. What might the numbers used in the problem represent? 15. What does this (figure, symbol, quantity, etc.) mean to you?

Unit 2
Understanding Operations with Rational Numbers

Concepts/Clusters	Prerequisite Standards to Support CC Math 7	Suggested Resources
Apply and extend previous understandings of operations with fractions to add, subtract, multiply,	**5.NF.4:** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product $(a/b) \times q$ as a parts	1. ***Inside Mathematics:*** Cindy's Cats http://www.insidemathematics.org/assets/common-core-math-tasks/cindy%27s%20cats.pdf 2. ***101 Questions:*** Nana's Lemonade http://www.101qs.com/3043

Concepts/Clusters	Prerequisite Standards to Support CC Math 7	Suggested Resources
and divide rational numbers	of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations *a* × *q* ÷ *b*. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)* b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. **6.NS.1:** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How*	3. ***NCTM Illuminations:*** *A Brownie Bake* http://illuminations.nctm.org/Lesson.aspx?id=814 4. ***Illustrative Mathematics:*** Baking Cookies https://www.illustrativemathematics.org/illustrations/50 5. ***Illustrative Mathematics:*** Video Game Credits https://www.illustrativemathematics.org/illustrations/267 6. ***Illustrative Mathematics:*** Making Hot Cocoa, Variation 1 https://www.illustrativemathematics.org/illustrations/407 7. ***Illustrative Mathematics:*** Jayden's Snacks https://www.illustrativemathematics.org/illustrations/273 8. ***Illustrative Mathematics:*** Movie Tickets https://www.illustrativemathematics.org/illustrations/1299 9. ***Illustrative Mathematics:*** Mile High https://www.illustrativemathematics.org/illustrations/278 10. ***Illustrative Mathematics:*** It's Warmer in Miami https://www.illustrativemathematics.org/illustrations/277 11. ***Illustrative Mathematics:*** Integers on the Number Line https://www.illustrativemathematics.org/illustrations/283 12. ***Mathematics Assessment Project:*** Interpreting Multiplication and Division http://map.mathshell.org/materials/download.php?fileid=1581

Concepts/Clusters	Prerequisite Standards to Support CC Math 7	Suggested Resources
	wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi? **6.NS.3:** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. **6.NS.5:** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. **6.NS.6:** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.	13. ***Mathematics Assessment Project:*** Factors and Multiples http://map.mathshell.org/materials/lessons.php?taskid=578#task578 14. ***Mathematics Assessment Project:*** Using Standard Algorithms http://map.mathshell.org/materials/lessons.php?taskid=587#task587 15. ***Mathematics Assessment Project:*** Fractions, Decimals, and Percents http://map.mathshell.org/materials/lessons.php?taskid=575#task575 16. ***Mathematics Assessment Project:*** A Measure of Slope http://map.mathshell.org/materials/lessons.php?taskid=582#task582

Concepts/Clusters	Prerequisite Standards to Support CC Math 7	Suggested Resources
	b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. **6.NS.7:** Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.* b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3°C > –7°C to express the fact that –3°C is warmer than –7°C.* c. Understand the absolute value of a rational number as its distance from 0	

Concepts/Clusters	Prerequisite Standards to Support CC Math 7	Suggested Resources
	on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.* d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.*	

Examples of Essential Questions for Unit 2	Standards for Mathematical Practice
1. What might be an effective strategy to find the area of a rectangle with fractional side lengths? 2. Why does a positive or negative integer's relationship to zero matter? 3. How are positive and negative numbers used in the real-world? 4. How might finding the GCF create efficiency when solving problems? 5. Why might someone want to use the absolute value of a number in place of the value of a rational number?	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.

Performance Objectives for Unit 2 *Students will grow in their ability to:*	***Guiding Questions for Implementing Standards for Mathematical Practices #3 and #4**
1. Develop a fundamental understanding that the multiplication of a fraction by a whole number could be represented as repeated addition of a unit fraction (e.g., 3 x ½ = ½ + ½ + ½) 2. Multiply fraction by whole numbers 3. Multiply fractions by fractions 4. Interpret the product of a fraction times a fraction as the total	1. What mathematical evidence supports your thinking? 2. What made you choose that strategy? 3. How can you be sure that …? 4. How could you prove that …? 5. Will your approach still work if …? 6. What were you considering when …?

Performance Objectives for Unit 2 *Students will grow in their ability to:*	***Guiding Questions for Implementing** **Standards for Mathematical Practices #3 and #4**
number of parts of the whole 5. Find the area of a rectangle with fractional side lengths using different strategies 6. Represent fraction products as rectangular areas 7. Interpret quotients of fractions 8. Compute quotients of fractions divided by fractions (including mixed numbers) 9. Solve word problems involving division of fractions by fractions 10. Write contextual problems for fraction division problems 11. Fluently use the standard algorithm for adding, subtracting, multiplying, and dividing multi-digit decimals 12. Use estimation strategies to support their understanding of decimal operations. 13. Understand the relationship between a positive and negative integer in relation to zero 14. Describe positive and negative numbers in relation to zero in a real-world context 15. Understand a rational number as a point on the number line 16. Recognize opposite signs of numbers as locations on opposite sides of 0 on the number line 17. Understand signs of numbers in ordered pairs 18. Find and position integers and other rational numbers on a horizontal or vertical number line 19. Understand ordering and absolute value of rational numbers 20. Interpret statements of inequality as statements 21. Write, interpret, and explain statements of order for rational numbers in real-world context 22. Understand the absolute value of a rational number as its distance from 0 on the number line 23. Distinguish comparisons of absolute value from statements about order	7. How did you decide on that strategy? 8. How did you test whether or not your approach is correct? 9. How did you decide what the problem was asking you to find? 10. Did you initially try a method that did not work? What hunches might you have for why it didn't work? 11. What is the same and what is different about …? 12. How might you demonstrate a counterexample? 13. What mathematical model might you construct to represent the problem? 14. What are some ways to represent the quantities? 15. Where do you see one of the quantities in the task in your solution? 16. What are some ways to visually represent …? 17. What might be an expression or equation that matches the … (diagram, figure, table, etc.)? 18. Would it help to create a mathematical model (diagram, graph, table, etc.)?

Performance Objectives for Unit 2 *Students will grow in their ability to:*	***Guiding Questions for Implementing** **Standards for Mathematical Practices #3 and #4**

Unit 3 **Understanding Expressions and Linear Equations**		
Concepts/Clusters	**Standards to Support CC Math 7**	**Suggested Resources**
Use properties of equations to generate equivalent expressions	**6.EE.3:** Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.* **6.EE.4:** Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*	1. (6.EE.3) **Khan Academy:** Equivalent Forms of Expressions 2. (6.EE.3) **NCTM Illuminations:** *Algebra in Balance* *Balancing Shapes* *Calculation Nation* *Everything Balances Out in the End* *Real Estate Tycoon* 3. (6.EE.3) **Online Practice from IXL:** Add and Subtract Integers Multiplication: Properties of multiplication 4. (6.EE.4) **Khan Academy:** Equivalent Forms of Expressions 5. (6.EE.4) **NCTM Illuminations:** *Algebra in Balance* Everything Balances Out in the End Real Estate Tycoon 6. (6.EE.4) **Online Practice from IXL:** Add and Subtract Like Terms

Solve real-life and mathematical problems using numerical and algebraic expressions and equations	**6.EE.6:** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. **6.EE.7:** Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers. **6.EE.8:** Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	7. (6.EE.6) **Khan Academy:** Constructing and Solving Equations in the Real World 8. (6.EE.6) **NCTM Illuminations:** Building Bridges 9. (6.EE.6) **Online Practice from IXL:** Write Variable Expressions Solve Word Problems 10. (6.EE.7) **Khan Academy:** Constructing and Solving Equations in the Real World One-Step Equation Intuition One-Step Equations with Multiplication 11. (6.EE.7) **NCTM Illuminations:** Building Bridges 12. (6.EE.8) **Khan Academy:** Inequalities in One Variable Inequalities on a Number Line 13. (6.EE.8) **Online Practice from IXL:** Inequalities on a Number Line
Examples of Essential Questions for Unit 3		**Standards for Mathematical Practice**

1. Why are equations, graphs, and tables beneficial to representing relationships? 2. What strategies might we use to create two equivalent expressions? 3. Why is equivalency (or equality) important to solving problems? 4. How might we use equations to solve real-world problems? 5. Why might we use algebraic expressions to represent unknowns? 6. How might we represent numerical constraints (inequalities) algebraically? 7. How might an inequality be used to describe a real-life situation? 8. Why does using the distributive property create an equivalent expression? 9. How might we know that two expressions are equivalent? 10. Why is there a distinction between equations and inequalities?	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.
Performance Objectives for Unit 3 *Students will grow in their ability to:*	***Guiding Questions for Implementing Standards for Mathematical Practices #5 and #6**
1. Use the distributive property to generate equivalent expressions 2. Identify when two expressions are equivalent 3. Prove that two equations are equivalent regardless of the number substituted 4. Write expressions to represent various real-world situations 5. Understand that a variable can represent an unknown number 6. Solve and write equations for real-world mathematical problems 7. Write inequalities to represent real-world situations 8. Identify the constraint or condition in a real-world situation in order to set-up an inequality 9. Recognize that inequalities of the form, $x > c$ or $x < c$, have infinitely many solutions. 10. Represent solutions to inequalities of the form, $x > c$ or $x < c$, on number line diagrams	1. What mathematical tools could we use to visualize and represent the situation? 2. What information have we been given? 3. What do you know that is not stated explicitly in the problem? 4. What approach are you considering trying first? 5. In this situation, what might be helpful to use (a ruler, graph paper, number line, diagram, patty paper, calculator, manipulative, etc.)? 6. What can using a … show us that … may not? 7. What might it be helpful to use a …? 8. What mathematical terms apply in this situation? 9. How did you know your solution was reasonable? 10. Explain how you might show that your solution satisfies the problem. 11. Is there a more efficient strategy? 12. What symbols or mathematical notations are important in this problem? 13. What domain-specific language can you use to explain …?

Performance Objectives for Unit 3 *Students will grow in their ability to:*	***Guiding Questions for Implementing** **Standards for Mathematical Practices #5 and #6**
	14. How might you test your solution to see if it answers the problem?

Unit 4 **Understanding Geometry and Statistical Probability**		
Concepts/Clusters	**Standards to Support CC Math 7**	**Suggested Resources**
Draw, construct, and describe geometrical figures and describe the relationships between them Solve real-life and mathematical problems involving angle measure, area, surface area, and volume	**6.G.1:** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	**Math Assessment Project-** Security Camera http://map.mathshell.org/materials/tasks.php?taskid=273&subpage=expert Fruit Boxes http://map.mathshell.org/materials/tasks.php?taskid=275&subpage=expert Dollar Wall http://www.101qs.com/61-dollar-wall **NCTM**-Creating a Fire wise Defensible Space http://illuminations.nctm.org/Lesson.aspx?id=2232 Discovering the Area Formula for Circles http://illuminations.nctm.org/Lesson.aspx?id=1852 Discovering the Area Formula for Triangles http://illuminations.nctm.org/Lesson.aspx?id=1874 Distributing and Factoring Using Area http://illuminations.nctm.org/Lesson.aspx?id=2682 Finding the Area of Parallelograms http://illuminations.nctm.org/Lesson.aspx?id=1882 Finding the Area of Trapezoids http://illuminations.nctm.org/Lesson.aspx?id=1893 IGD: Area of a Parallelogram http://illuminations.nctm.org/Activity.aspx?id=4158 IGD: Area of a Rectangle

Concepts/Clusters	Standards to Support CC Math 7	Suggested Resources
		http://illuminations.nctm.org/Activity.aspx?id=4159 IGD: Area of a Triangle http://illuminations.nctm.org/Activity.aspx?id=4160 Interactive Geometry Dictionary: Areas in Geometry http://illuminations.nctm.org/Activity.aspx?id=4243 IXL Area of Triangle http://www.ixl.com/math/grade-6/area http://ccssmath.org/?page_id=570 Illustrative Math-Finding Areas of Polygons https://www.illustrativemathematics.org/illustrations/647 Base and Height https://www.illustrativemathematics.org/illustrations/656 Same Base and Height, Variation 2 https://www.illustrativemathematics.org/illustrations/510 Banana Bread https://www.illustrativemathematics.org/illustrations/657 Computing Volume Progression 1 https://www.illustrativemathematics.org/illustrations/534 Computing Volume Progression 2 https://www.illustrativemathematics.org/illustrations/535 Computing Volume Progression 3 https://www.illustrativemathematics.org/illustrations/536 Computing Volume Progression 4 https://www.illustrativemathematics.org/illustrations/537 Opus Math-Area of Rectangle, Triangle, Composite http://www.opusmath.com/common-core-standards/6.g.1-find-the-area-of-right-triangles-other-triangles-special-quadrilaterals Yummy Math- Chocolates http://www.yummymath.com/2013/chocolates-2/

Concepts/Clusters	Standards to Support CC Math 7	Suggested Resources
Use random sampling to draw inferences about a population Draw informal comparative inferences about two populations	**6.SP.1:** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.* **6.SP.2:** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	*Identifying Statistical Questions* *https://www.illustrativemathematics.org/illustrations/703* *Recognize Statistical Questions* *http://www.opusmath.com/common-core-standards/6.sp.1-recognize-a-statistical-question-as-one-that-anticipates-variability-in* *Buttons: Statistical Questions* *https://www.illustrativemathematics.org/illustrations/1040* *Recognizing and asking statistical questions* *https://www.youtube.com/watch?v=H10rwoozHTk* Figuring the Odds (Probability Puzzles) - Twenty questions with answers http://www.benbest.com/science/theodds.html **Understanding Probability** - Lesson plan from Discovery Education http://www.discoveryeducation.com/teachers/free-lesson-plans/understanding-probability.cfm

Examples of Essential Questions for Unit 4	Standards for Mathematical Practice
1. How might knowing the area of triangles and rectangles assist in finding the area of other polygons? 2. How is geometry a part of our everyday lives? 3. Why might conceptually understanding the characteristics of two-dimensional and three-dimensional figures be helpful? 4. Why is *organizing* data essential to its' usefulness? 5. Why might graphs be used to represent statistical relationships? 6. What might the benefit be in displaying data in various ways? And, in what ways might we choose to display this data? 7. Why might collected data to answer a statistical question have a distribution (center, spread, and overall shape)?	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.

Performance Objectives for Unit 4 *Students will grow in their ability to:*	*Guiding Questions for Implementing Standards for Mathematical Practices #7 and #8

Performance Objectives for Unit 4 *Students will grow in their ability to:*	***Guiding Questions for Implementing** **Standards for Mathematical Practices #7 and #8**
1. Know the formulas for rectangles and triangles 2. Decompose shapes into rectangles and triangles to determine the area 3. Apply decomposing techniques in the context of solving real-world and mathematical problems 4. Recognize a statistical question as one that anticipates variability in the data related to the question 5. Recognize that data can have variability 6. Understand that a set of data has a distribution 7. Describe a set of data by its center 8. Describe a set of data by its spread and overall shape	1. What observations have you made about …? 2. What do you notice when …? 3. What parts of the problem might you eliminate? 4. How would you know if … makes a pattern? 5. What useful ideas have we learned before that come in handy when solving this problem? 6. How does this relate to …? 7. In what ways might this problem connect to other mathematical concepts? 8. Will the same strategy work in other situations? 9. Is this always true, sometimes true, or never? 10. How would you prove that …? 11. What is happening in this situation? 12. Could we make a mathematical rule for …? 13. What mathematical consistencies do you notice? 14. What predictions or generalizations can this pattern support?

*NOTE: The *Guiding Questions for Implementing Standards for Mathematical Practices* should be used throughout ALL units and are not exclusive to any particular unit.

TOOLS TO ENGAGE KINESTHETIC AND VISUAL LEARNERS

The following are a just a few hands-on (or virtual) manipulatives to engage and support the learning for our kinesthetic and visual learners.

Annenberg Learner: Interactives-Geometry 3D Shapes	Base Ten Materials
NCTM Illuminations: Isometric Drawing Tool	Pattern Blocks
Fraction Circles	Geometric Solids
Algebra Tiles	Fraction Pattern Blocks
Dice	

INSTRUCTIONAL STRATEGIES FOR IMPLEMENTING THE STANDARDS FOR MATHEMATICAL PRACTICES

The following instructional strategies represent just a short list of strategies recommended to ensure student engagement with the Standards for Mathematical Practices, as well as the Common Core College and Career Readiness Anchor Standards for Literacy (Reading, Writing, Speaking, and Listening).

Instructional Strategies	Description
1. Activating Prior Knowledge	*Activating Prior Knowledge* allows students to connect concepts learned previously to content being taught at the time. This strategy ensures coherence throughout the course.
2. Carousel	*Carousel* allows for students to collaborate on a particular problem in groups of 3-4. Students take turns with working on a problem, passing it around, round-robin style as they add to solving the problem, while checking the work of others throughout the process.
3. Corners	The *Corners* strategy works by having students select from four options (which are posted in each of the corners of the room). Once students have chosen their corners, they may be asked to defend their choice and listen to their peers' reasons for choosing a particular option, or corner.
4. Error Analysis	This strategy calls for students to analyze a problem that has been solved incorrectly. They must work with a partner to figure it out, discuss their findings, write the correct solution, and write a few paragraphs on their process and thinking.
5. Exit Tickets	*Exit Tickets* help students synthesize the learning of the day's lesson. These can be simple questions or quick-writes for students to submit at the end of the period.
6. Multiple Representations	This strategy allows students to create multiple representations in the form of pictures, tables, graphs, equations, formulas, and other models to analyze and interpret data and/or other information.
7. Poster Presentations	Students use large flip chart paper (during any stage of instruction) to collaborate, provide visuals, and solve problems. After each group is done creating posters, they may present them to the larger group or conduct a "gallery walk" to see each group's findings.

Instructional Strategies	Description
8. Questioning the Text	This strategy allows students to question the text, the problem or the situation. They can annotate and collaborate to incite discourse in the classroom.
9. Sentence Frames	Sentence Starters give students a structure for sharing their thoughts and ideas and guide accountable talk. Examples for use include: I think the best way to solve this problem is … I would not solve it this way because … I (agree/disagree) because … I don't think that will work because … I tried … I think … will happen. I solved the problem like this because … What if we tried … I have another approach to the problem. What about … I understand what you are saying, but what about … Now I understand … because … I agree with … because … At first, I though … but, now I think … I agree with … because … What I hear you saying is … I don't understand … but, I do understand … Another approach to this problem could be …
10. Think Alouds	In *Think Alouds*, students orally dictate their thought process to show their comprehension of a problem, text or situation. It helps when trying to make sense of problems and considering different access points to solving a problem.
11. Think-Pair-Share	Students engage in *Think-Pair-Share* by initially thinking about a problem or situation independently, then pair up with a classmate to share their thoughts or ideas.
12. Think-Ink-Pair-Share	An alternative to *Think-Pair-Share* is *Think-Ink-Pair-Share* which allows students to think independently, write their thoughts on paper, and then pair up with a partner to share their thoughts.

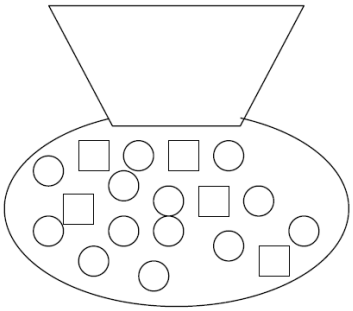
SAMPLE TASKS TO SUPPORT CC MATH 7

The following are a few examples to help support student learning in this course. These examples are not meant to be exhaustive, but are representative of the types of tasks that should be afforded to students enrolled in the course.

Sample Tasks to Support Common Core Math 7 Tutorial Lab

Sample Task #1: *The Candy Jar Task*

The candy jar shown below contains Jolly Ranchers (the rectangles) and Jawbreakers (the circles). Use that information to complete the following questions.



1. What is the ratio of Jolly Ranchers to Jawbreakers in the candy jar?
2. Write as many ratios as you can that are equivalent to the first ratio that you wrote in Question #1.
3. Suppose you had a new candy jar with the same ratio of Jolly Ranchers to Jawbreakers as shown above, but it contained 100 Jolly Ranchers. How many Jawbreakers would you have?
4. Suppose you had a new candy jar with the same ratio of Jolly Ranchers to Jawbreakers as shown above, but it contained 720 candies. How many of each candy would you have?

Source: LAUSD Concept Task

Sample Task #2: *Smallest and Largest*

In this task, make up calculations with answers that are:

1. As ***large*** as possible
2. As ***small*** as possible

For each calculation, choose two different numbers from the list.

$\frac{1}{2}$ 1 2 10 20 50

$\square + \square = \_\_\_\_$

$\square - \square = \_\_\_\_$

$\square \times \square = \_\_\_\_$

$\square \div \square = \_\_\_\_$

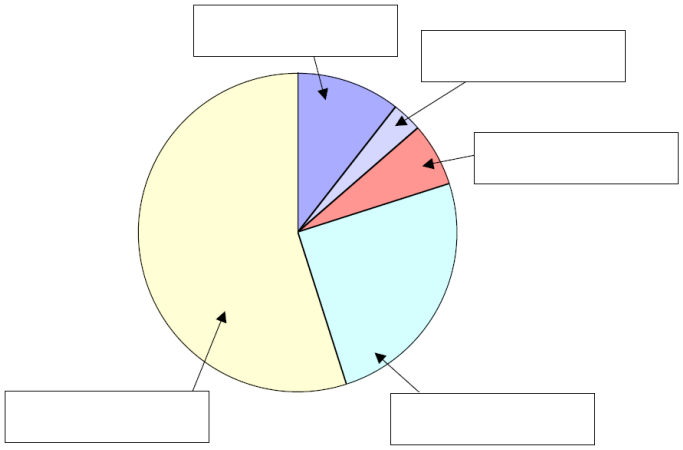
Lastly, ***explain*** how to choose numbers to make the answer to a division problem ***as small as possible***.

Source: MARS Tasks (Grade 6)

Sample Tasks to Support Common Core Math 7 Tutorial Lab

Sample Tasks #3: *Nuts*

This circle graph shows the amounts of five different kinds of nuts grown in the U.S. each year.



Given:
Here are some facts about the nuts grown:

- Most of the nuts are Almonds
- A quarter of the nuts are Walnuts
- The least grown nuts are Macadamias
- There are about twice as many Pistachios as Macadamias grown
- The fifth type of nut is Hazelnut

Questions:

1. Write the correct kind of nut on each label.

2. The total of all nuts grown is 956 thousand tons. What amount of walnuts are grown? Show all calculations.
   _____thousand tons

3. Kealoha says that 80% of all the nuts grown in the U.S. are almonds. Explain why Kealoha is wrong.

Source: MARS Tasks (Grade 6)

Sample Task #4: *Buying Books*

At *Mai Ka'i Bookstore*, Malia bought 3 paperback books for $18.50

1. What would 7 books cost her?
2. How many books might Malia purchase with $55?
3. How many books could she purchase with $175?

Create a table, a graph, an equation, and one paragraph, to justify your solution.

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