

COURSE DESCRIPTION

Geometry Foundations SH is designed to provide foundational knowledge and intervention for students enrolled in or preparing to enroll in Common Core Geometry. 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 Geometry course. Geometry Foundations SH 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 Geometry course. This course addresses: making geometric constructions; experimenting with transformations in the plane; understanding congruence in terms of rigid motions. Students prove geometric theorems; understand similarity in terms of similarity transformations; prove theorems involving similarity; expressing geometric properties with equations; similarity, right triangles, and trigonometry; geometric measurement and dimension. Students would us know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. They will engage in conditional probability and rules of probability as well as use probability to make decisions.

COURSE SYLLABUS

The standards for this intervention course are taken primarily from the Common Core Grade 7 and Common Core Grade 8 math standards and support the major clusters defined in the LAUSD Curricular Maps for Common Core Geometry. Additionally, an immense element of this intervention course is an emphasis on student engagement with the Standards for Mathematical Practice on a daily basis. The structure of this course is divided into four separate, but coherent, units mirroring the Common Core Geometry course. The aim of this intervention course is to support Common Core Geometry 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 Geometry Foundations SH is to create evidence-based intervention plans that are customized to individual students, and that are also tied to specific Common Core Standards.

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.

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.

Multi-tier Mathematics Interventions

Gersten et. al. (2009) in the Practice Guide "Assisting Students Struggling with Mathematics: Rtl 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). Teachers may consider using some of the strategies in "Improving Mathematical Problem Solving in Grades 4 Through 8" in teaching students problem solving.

Recommendation 1. Prepare problems and use them in whole-class instruction.

Recommendation 2*. Assist students in monitoring and reflecting on the problem-solving process.

Recommendation 3*. Teach students how to use visual representations.

Recommendation 4. Expose students to multiple problem-solving strategies.



Recommendation 5. Help students recognize and articulate mathematical concepts and notation.

^{*}Strong Evidence.

Unit 1 Congruence Through Transformations				
Concepts/Clusters	Standards to Support CC Geometry	Suggested Resources		
Make geometric constructions	7.G.2: 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.	Math Open Reference: Online construction demonstrations. http://mathopenref.com/tocs/constructionstoc.html Engage NY: Congruence, Proof, Constructions. NCTM Illuminations: Maya Constructions. Desmos IXL iReady		
Experiment with transformations in the plane	 8.G.1: Verify experimentally the properties of rotations, reflections, and translations: a) Lines are taken to lines, and line segments to line segments of the same length. b) Angles are taken to angles of the same measure. c) Parallel lines are taken to parallel lines. G-CO.4: Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallellines, and line segments. 	1. MARS Task: Representing and Combining Transformations. 2. Engage NY: The Concept of Congruence. 3. NCTM Illuminations: Cyclic Figures. 4. NCTM Illuminations: Dihedral Figures. 5. Inside Mathematics: "Cut It Out" activity. 6. MARS Task: Aaron's Designs. 7. Newark Public Schools: Similarity and Congruence Module. 4. Desmos 5. IXL 6. iReady		



			UNIFIED
Understand congruence	8.G.2: Understand that a two-dimensional	1.	Illustrative Mathematics: Congruent
in terms of rigid motions	figure is congruent to another if the		Segments.
	second can be obtained from the first by	2.	Illustrative Mathematics: Congruent
	a sequence of rotations, reflections, and		Rectangles.
	translations; given two congruent figures,	3.	Illustrative Mathematics: Congruent Triangles.
	describe a sequence that exhibits the	4.	Desmos
	congruence between them.	5.	IXL
		6.	iReady
	G-CO.5: Given a geometric figure and a		
	rotation, reflection, or translation, draw		
	the transformed figure using, e.g., graph		
	paper, tracing paper, or geometry		
	software. Specify a sequence of		
	transformations that will carry a given		
	figure onto another.		
	G-CO.7: Use the definition of congruence		
	in terms of rigid motions to show that two		
	triangles are congruent if and only if		
	corresponding pairs of sides and		
	corresponding pairs of angles are		
	congruent.		
Prove geometric	8.G.3:	1.	Illustrative Mathematics: Reflecting Reflections.
theorems	Describe the effect of dilations,	2.	Illustrative Mathematics: Triangle Congruence
	translations, rotations, and reflections on		with Coordinates.
	two-dimensional figures using	3.	Desmos
	coordinates.	4.	IXL
		5.	iReady
	G-CO.6: Use geometric descriptions of		-
	rigid motions to transform figures and to		
	predict the effect of a given rigid motion		
	on a given figure; given two figures, use		
	the definition of congruence in terms of		



			UNIFIED
	rigid motions to decide if they are congruent.		
	Examples of Essential Questions for the Unit		Standards for Mathematical Practice
2.3.4.5.6.	Why is it important to draw a figure using accurate conditions? How are geometric attributes of a shape affected when movement occurs? What tools can be used to make geometric constructions? What types of transformations can be done in a plane? How can we use rigid motions to understand congruence? Distinguish the difference between transformations that are rigid (preserve distance and angle measure) and those that are not (dilations). How is visualization essential to the study of geometry? How might the concept of rigid motion connect to the concept of congruence?	2. R 3. C 4. M 5. U 6. A 7. L 8. L	Make sense of problems and persevere in olving them. Reason abstractly and quantitatively. Construct viable arguments and critique the easoning of others. Model with mathematics. Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated easoning.
	Performance Objectives for Unit 1 Students will grow in their ability to:	Star	Guiding Questions for Implementing ndards for Mathematical Practices #1 and #2
2.3.4.5.6.7.	Make geometric constructions. Visually represent geometric figures. Understand the characteristics of angles (and sides) that create triangles. Construct triangles from three given side measures to determine when there is a unique triangle, more than one triangle, or no triangle. Experiment with transformations in the plane. Understand that transformations produce images of exactly the same size and shape as the pre-image. Verify that congruence of angles are maintained through rotations, reflections, and translations. Verify that when parallel lines are rotated, reflected or translated (each in the same way), they remain parallel lines.	2. W tc 3. W 4. W 5. S th 6. W 7. W al 8. D m 9. D	How might you describe this problem in your own words? What are some other problems that are similar of this problem? What do you notice about? What information is given in the problem? Share with me the steps you've used up to nis point. What are some other strategies you might try? Which steps in the process are you confident about? Describe what you have already tried. What night you change? Describe the relationship between the two gures.



- 9. Use physical models, transparencies, patty paper, or geometry software to verify the properties of transformations.
- 10. Understand congruence in terms of rigid motions.
- 11. Examine figures to determine congruency by identifying a sequence of rigid transformations that map one figure directly onto the other.
- 12. Apply the concept of congruency to write statements of congruency.
- 13. Prove geometric theorems.
- 14. Understand that dilations are not forms of rigid transformations.
- 15. Understand that dilations either enlarge (if the scale factor is more than 1) or reduce (if the scale factor is less than 1) the size of a figure.

- 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?

or a rigaro:		l .			
Unit 2					
	Similarity, Transformations, and Proofs				
Concepts/Clusters	Standards to Support CC Geometry		Suggested Resources		
Understand similarity in terms of similarity transformations.	7.G.1: 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. 8.G.4: Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	1. 2. 3. 4. 5. 6. 7.	Engage NY: Similarity. NCTM Illuminations: In Your Shadow. NCTM Illuminations: Inversions. MARS Task: Photographs. Desmos IXL iReady		



	UNIFIED	
8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so	 MARS Task: Finding Shortest Routes: The Schoolyard Problem. MARS Task: Identifying Similar Triangles. Illustrative Mathematics: Are They Similar? NCTM Illuminations: Angle Sums. Desmos IXL iReady 	
	Otan danda fan Mathana-til Diti	
and similarity alike? How are they utes are considered when comparing two utes are considered when examining ngles? ons help us understand similarity? I be used to prove two figures similar? hip between transformations that produce I transformations that produce similar	 Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics. Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning. 	
nance Objectives for Unit 2 s will grow in their ability to:	Guiding Questions for Implementing Standards for Mathematical Practices #3 and #	#4
in terms of similarity transformations. es using a sequence of transformations neasures and have proportional sides. ar figures are produced from dilations. similarity to write similarity statements. ures on grid paper.	 What mathematical evidence supports you thinking? What made you choose that strategy? How can you be sure that? How could you prove that? Will your approach still work if? 	r
	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so. Lestions for the Unit and similarity alike? How are they utes are considered when comparing two utes are considered when examining ngles? ons help us understand similarity? I be used to prove two figures similar? In be tween transformations that produce it transformations that produce similar. I ance Objectives for Unit 2 Simil grow in their ability to: In terms of similarity transformations. Les using a sequence of transformations heasures and have proportional sides. Les in tigures are produced from dilations. Les in tigures are produced from dilations. Les initiarity to write similarity statements.	B.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so. uestions for the Unit and similarity alike? How are they utes are considered when comparing two uses are considered when examining ngles? In the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so. Uestions for the Unit and similarity alike? How are they utes are considered when comparing two utes are considered when examining ngles? In the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so. Uestions for the Unit and similarity? It be used to prove two figures similar? hip between transformations that produce at transformations that produce at transformations that produce at transformations that produce as will grow in their ability to: In terms of similarity transformations easusing a sequence of transformations heasures and have proportional sides. Finding Schooling impacts: In MARS Task: Indentifying Similar Triangles. MCTM Illuminations: Angle Sums. Standards for Mathematical Practice Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Sues appropriate tools strategically. Attend to precision. Look for and make use of structure. Building Questions for Implementing Standards for Mathematical Practices #3 and in the produce of transformations in terms of similarity to write similarity statements.



7. How did you decide on that strategy? 6. Understand that proportionality is a numerical relationship that 8. How did you test whether or not your forms a straight line on the coordinate graph. 7. Prove theorems involving similarity. approach is correct? 8. Identify angles created when parallel lines are cut by a 9. How did you decide what the problem was asking you to find? transversal. 10. Did you initially try a method that did not 9. Justify that the sum of interior angles add up to 180o. 10. Justify that the exterior angle of a triangle is equal to the sum of work? What hunches might you have for why the two remote interior angles 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.)? Unit 3 **Expressing Geometric Properties with Equations** Standards to Support CC Geometry Concepts/Clusters Suggested Resources **Expressing Geometric** 8.EE.5: MARS Tasks: Properties with Graph proportional relationships, 1. Modeling Car Skid Marks. **Equations** interpreting the unit rate as the slope of 2. A Measure of Slope. 3. Real-Life Equations. the graph. Compare two different proportional relationships represented in 4. Interpreting Distance-Time Graphs. different ways. For example, compare a 5. Finding Shortest Routes: The Schoolvard distance-time graph to a distance-time Problem.



		ONIFIED
	equation to determine which of the two moving objects has greater speed. 8.EE.6: Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equations $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .	NCTM Illuminations: Fictional Stairs. NCTM: As the Crow Flies.
Examples of Essential O	uestions for the Unit 3	Standards for Mathematical Practice
 Examples of Essential Questions for the Unit 3 Why are there multiple strategies for solving a linear equations? What are some reasons to find the solution of a linear equation? What strategies use coordinates to prove geometric theorems algebraically? How might coordinate geometry be used to prove theorems algebraically? 		 Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics. Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
	nance Objectives for Unit 3	Guiding Questions for Implementing
Students will grow in their ability to:		Standards for Mathematical Practices #5 and #6
of the graph. 3. Graph proportional red 4. Sketch and interpret of 5. Determine unknown a	of proportional relationships as the slope elationships.	 What mathematical tools could we use to visualize and represent the situation? What information have we been given? What do you know that is not stated explicitly in the problem? What approach are you considering trying first?



UNIFIED			
 Find the slope of a line. Determine the y-intercept of a line. Derive equations of the form y = mx + b for a line through the origin. Derive equations of the form y = mx + b for a line intercepting the vertical axis at the y-intercept, b. Identify characteristics of similar triangles. 		6. 7. 8. 9. 10.	In this situation, what might be helpful to use (a ruler, graph paper, number line, diagram, patty paper, calculator, manipulative, etc.)? What can using a show us that may not? What might it be helpful to use a? What mathematical terms apply in this situation? How did you know your solution was reasonable? Explain how you might show that your solution satisfies the problem. Is there a more efficient strategy? What symbols or mathematical notations are important in this problem? What domain-specific language can you use to explain? How might you test your solution to see if it
			answers the problem?
	Unit 4		
	Similarity, Right Triangles, Trigonom		
Concepts/Clusters	Standards to Support CC Geometry		iggested Resources
Similarity, Right	8.G.7:		MARS Task: <u>The Pythagorean Theorem</u> .
Triangles and	Apply the Pythagorean Theorem to		NCTM Illuminations: Corner to Corner.
Trigonometry	determine side lengths in right triangle in	9.	Math Is Fun: <u>Supplementary and</u>
	real-world and mathematical problems in		Complementary.
	two and three dimensions.	10	.XP Math: Complementary and Supplementary
			Angle Pairs Practice.
	G-SRT.4: Prove theorems about	11	. Engage NY: Introduction to Irrational Numbers
	triangles. Theorems include: a line		Using Geometry.
	parallel to one side of a triangle divides		. Desmos
	the other two proportionally, and		.IXL
	conversely; the Pythagorean Theorem	14	.iReady
	proved using triangle similarity.		
		<u> </u>	



	G-SRT.8: Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	
	7.G.5: Use facts about supplementary, complementary, vertical and adjacent angles in multi-step problems to write and solve simple equations for an unknown angle in a figure.	
	G-SRT.5: Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	
	G-SRT.6: Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	
Geometric	6.G.4:	MARS Task
Measurement and	Represent three-dimensional figures	1. Optimizing Security Cameras.
Dimension	using nets made up of rectangles and	2. Optimizing: Packing It In.
	triangles and use the nets to find the	3. Using Dimensions: Designing a Sports Bag.
Know the formulas for	surface area of these figures applying	4. The Area of a Circle.
the area and	these techniques in the context of solving	
circumference of a circle	real world mathematical problems.	5. Dan Meyer: <u>The Ticket Roll</u> .
and use them to solve		6. Inside Mathematics: Polly Gone.
problems; give an	8.G.9 : Know the formulas for the volumes of	7. NCTM Illuminations: Popcorn, Anyone?
informal derivation of	cones and cylinder, and spheres and use them to solve real world and mathematical	8. NCTM Illuminations: Popcorn Cylinders
the relationship between	problems.	Anyone? 9. NCTM Illuminations: Cubed Cans.
the circumference and	p. 52.55.	10. Dan Meyer: Popcorn Picker.
area of a circle.		10. Dan Meyer. 1 opcom 1 loke.



	UNIFIED
G-GPE: Use coordinates to compute	11. Engage NY: Module 5, Lesson 9: Examples of
	Functions from Geometry.
distance formula.	
6. SP.5: Understand that the probability of	1. MARS Task: Evaluating Statements about
a chance event is a number between 0	Probability.
and 1 that expresses the likelihood of	2. MARS Task: Probability Games.
the even occurring. Larger numbers	3. AAAS: Marble Mania
	4. NCTM Illuminations: Random Drawing Tool
	5. Engage NY: Statistics and Probability.
•	<u> </u>
•	
•	
ovoni.	
S-CP1: Describe events as subsets of a	
` ` ` ,	
,	4 NOTMILL C. MILLON CO.
·	1. NCTM Illuminations: What Are My Chances?
	2. NCTM ILLUMINATIONS: Sticks and Stones.
	3. INSIDE MATHEMATICS: <u>Fair Games</u> .
• •	4. INSIDE MATHEMATICS: Game Show.
	5. College Preparatory Mathematics: Statistics
	Supplement.
sample space for which the compound	
event occurs.	
b. Represent sample spaces for	
compound events using methods such as	
organized lists, tables and tree diagrams.	
	perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula. 6. SP.5: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the even occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely even, a probability around ½ indicates an even that is neither unlikely nor likely and a probability near 1 indicates a likely event. S-CP.1: Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not"). 7.SP.8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using methods such as



			OMIFIED
	For an event described in everyday language (e.g., "rolling double sixes"), identify he outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: if 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood? S-CP.2: Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. S-CP.3: Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of B given A is the same as the probability of B given A is the same as the probability of B.		
Examples of Essential Qu	uestions for the Unit 4	Standards for Mathematical Prac	tice
	n between the distance formula and the	Make sense of problems and	
Pythagorean Theorem	1?	solving them.	•



- 2. What is a strategy to determine with accuracy whether a given triangle is a right triangle?
- 3. What is a strategy to calculate with accuracy the distance between any two points?
- 4. What is the importance of 0 and 1 when examining the probability of an event?
- 5. What efficient strategies can be used to help determine the probability of a chance event?
- 6. What efficient strategies can be used to help determine the likeness of compound events to occur?

- 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:

- 1. Define trigonometric ratios and solve problems involving right triangles.
- 2. Build capacity in knowing common Pythagorean Triples.
- 3. Know that 3-D figures can be represented by nets.
- 4. Apply prior knowledge of finding the area of rectangles and triangles to a net and combining the areas of each shape to represent the surface area of the 3D figure.
- 5. Solve real world problems involving surface area and nets.
- 6. Grasp geometric measurement and dimensions.
- 7. Understand the relationship between radius and diameter.
- 8. Understand that the ratio of circumference to diameter can be expressed as pi.
- 9. Informally derive the relationship between circumference and area of a circle.
- 10. Geometric measurement and dimensions
- 11. Understand that knowing the formula for volume refers to the relationship between the area of the base and the height of the figure.
- 12. Comprehend the relationship between the volume of a cylinder and that of a cone.

Guiding Questions for Implementing Standards for Mathematical Practices #7 and #8

- 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?



- 13. Solve real-world application problems.
- 14. Draw conclusions to determine that a greater likelihood occurs as the number of favorable outcomes approaches the total number of outcomes.
- 15. Know that probability is expressed as a number between 0 and 1.
- 16. Create visual representations of data.
- 17. Develop probability models to find the probability of events.
- 18. Use probability to make decisions.
- 19. Predict frequencies of outcomes.
- 20. Define and describe compound events.
- 21. Identify the outcomes in the sample space for a relevant event
- 22. Choose appropriate methods (such as organized lists, tables and tree diagrams) to represent sample spaces for compound events.
- 23. Compare experimental probability to theoretical probability.

INSTRUCTIONAL STRATEGIES FOR IMPLEMENTING THE STANDARDS FOR MATHEMATICAL PRACTICES

SAMPLE TASKS TO SUPPORT CC GEOMETRY

References

- 1. LAUSD Curriculum Map, http://lausd.or/math
- 2. National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). Common Core State Standards (Mathematics). Washington D.C.: National Governors Association Center for Best Practices, Council of Chief State School Officers.
- 3. McCallum, W., Zimba, J., Daro, P. (2011, December 26 Draft). Progressions for the Common Core State Standards in Mathematics. Cathy Kessel (Ed.). Retrieved from http://ime.math.arizona.edu/progressions/#committee.
- 4. Engage NY. (2012). New York Common Core Mathematics Curriculum. Retrieved from http://www.engageny.org/resource/high-school-algebra-i.



- 5. Mathematics Assessment Resource Service, University of Nottingham. (2007 2012). Mathematics Assessment Project. Retrieved from http://map.mathshell.org/materials/index.php.
- 6. Smarter Balanced Assessment Consortium. (2012). Smarter Balanced Assessments. Retrieved from http://www.smarterbalanced.org/.
- 7. Partnership for Assessment of Readiness for College and Career. (2012). PARCC Assessments. Retrieved from http://www.parcconline.org/parcc-assessment.
- 8. California Department of Education. (2013). Draft Mathematics Framework Chapters. Retrieved from http://www.cde.ca.gov/be/cc/cd/draftmathfwchapters.asp.
- 9. National Council of Teachers of Mathematics (NCTM) Illuminations. (2013). Retrieved from http://illuminations.nctm.org/Weblinks.aspx.
- 10. The University of Arizona. (2011-12). Progressions Documents for the Common Core Math Standards. Retrieved from http://ime.math.arizona.edu/progressions.
- 11. Delaware Department of Education (July, 2013). Common Core Assessment Comparison for