### ACADEMIC COURSE OUTLINE

<table>
<thead>
<tr>
<th>Department</th>
<th>Mathematics</th>
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</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>Geometry ACC</td>
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<tr>
<td>Course Code</td>
<td>2971</td>
</tr>
<tr>
<td>Grade Level</td>
<td>9 – 12</td>
</tr>
<tr>
<td>Short Title</td>
<td>GEO ACC</td>
</tr>
<tr>
<td>Grad Requirement</td>
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<tr>
<td>Subject</td>
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<tr>
<td>Course Length</td>
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<tr>
<td>Credits per Semester</td>
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<tr>
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<tr>
<td>Prerequisites</td>
<td>B or better in Algebra 1</td>
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<tr>
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<td>Articulated with CSULB</td>
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<td>Meets NCAA Requirement</td>
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<td>Teaching Credential(s)</td>
<td>Teachers with any of these credentials are authorized to teach this course:</td>
</tr>
<tr>
<td></td>
<td>• Single Subject Credential in Mathematics (SS)</td>
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<tr>
<td></td>
<td>• Single Subject Credential in Foundational Mathematics (SSFM)</td>
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<tr>
<td></td>
<td>• Multiple Subject Credential or Single Subject Credential in content other than math, with a Single Subject Authorization in Introductory Mathematics (SMA)</td>
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### COURSE OVERVIEW:

The fundamental purpose of the Geometry Accelerated course is to formalize and extend students’ geometric experiences from the middle grades. This course includes standards from the Geometry conceptual category. Some standards are repeated in multiple higher mathematics courses; therefore instructional notes, which appear in brackets, indicate what is appropriate for study in this particular course.

In this Geometry Accelerated course, students explore more complex geometric situations and deepen their explanations of geometric relationships, presenting and hearing formal mathematical arguments. Important differences exist between this course and the historical approach taken in geometry classes. For example, transformations are emphasized in this course.

For the Geometry Accelerated course, instructional time should focus on five critical areas: (1) establish criteria for congruence of triangles based on rigid motions; (2) establish criteria for similarity of triangles based on dilations and proportional reasoning; (3) informally develop explanations of circumference, area, and volume formulas; (4) apply the Pythagorean Theorem to the coordinate plan; and (5) prove basic geometric theorems.

### EXPECTED OUTCOMES

Students are expected to perform at a proficient level on a variety of tasks and assessments addressing the Common Core Standards for Mathematical Practice and the Common Core State Standards addressed in Geometry Accelerated. Levels of proficiency are defined near the end of this course outline under Performance Criteria.

**Common Core State Standards for Mathematical Practice (SMP)**

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.

**Common Core State Standards for Mathematical Content (CCSS-M)**

**Geometry**

<table>
<thead>
<tr>
<th>Congruence</th>
<th>G-CO</th>
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<tr>
<td><strong>Experiment with transformations in the plane.</strong></td>
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<tr>
<td>G-CO.1</td>
<td>Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.</td>
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<tr>
<td>G-CO.2</td>
<td>Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).</td>
</tr>
<tr>
<td>G-CO.3</td>
<td>Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.</td>
</tr>
<tr>
<td>G-CO.4</td>
<td>Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.</td>
</tr>
<tr>
<td>G-CO.5</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Understand congruence in terms of rigid motions.** [Build on rigid motions as a familiar starting point for development of concept of geometric proof.]

| 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 rigid motions to decide if they are congruent. |
| 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. |
| G-CO.8     | Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. |

**Prove geometric theorems.** [Focus on validity of underlying reasoning while using variety of ways of writing proofs.]

| G-CO.9     | Prove theorems about lines and angles. *Theorems include:* vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment’s endpoints. |
| G-CO.10    | Prove theorems about triangles. *Theorems include:* measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point. |
| G-CO.11    | Prove theorems about parallelograms. *Theorems include:* opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. |

**Make geometric constructions.** [Formalize and explain processes.]

| G-CO.12    | Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.* |
| G-CO.13    | Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle. |
Similarity, Right Triangles, and Trigonometry  

**Understand similarity in terms of similarity transformations.**

**G-SRT.1** Verify experimentally the properties of dilations given by a center and a scale factor:
- a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
- b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

**G-SRT.2** Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.

**G-SRT.3** Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.

**Prove theorems involving similarity.**

**G-SRT.4** Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.*

**G-SRT.5** Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

**Define trigonometric ratios and solve problems involving right triangles.**

**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.

**G-SRT.7** Explain and use the relationship between the sine and cosine of complementary angles.

**G-SRT.8** Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

**G-SRT.8.1** Derive and use the trigonometric ratios for special right triangles (30°, 60°, 90° and 45°, 45°, 90°). CA

**Apply trigonometry to general triangles.**

**G-SRT.9** (+) Derive the formula \( A = \frac{1}{2} ab \sin(C) \) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.

**G-SRT.10** (+) Prove the Laws of Sines and Cosines and use them to solve problems.

**G-SRT.11** (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

**Circles**

**Understand and apply theorems about circles.**

**G-C.1** Prove that all circles are similar.

**G-C.2** Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*

**G-C.3** Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

**G-C.4** (+) Construct a tangent line from a point outside a given circle to the circle.

**Find arc lengths and areas of sectors of circles.** [Radian introduced only as unit of measure]

**G-C.5** Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector. *Convert between degrees and radians.* CA

**Expressing Geometric Properties with Equations**

**Translate between the geometric description and the equation for a conic section.**

**G-GPE.1** Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.

**G-GPE.2** Derive the equation of a parabola given a focus and directrix.
G-GPE.3 (+) Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.

**Use coordinates to prove simple geometric theorems algebraically.** [Include distance formula; relate to Pythagorean Theorem.]

G-GPE.4 Use coordinates to prove simple geometric theorems algebraically. *For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point \((1, \sqrt{3})\) lies on the circle centered at the origin and containing the point \((0, 2)\).

G-GPE.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

G-GPE.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

G-GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula. *

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**Geometric Measurement and Dimension**

**G-GMD**

**Explain volume formulas and use them to solve problems.**

G-GMD.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*

G-GMD.2 (+) Give an informal argument using Cavalieri’s principle for the formulas for the volume of a sphere and other solid figures.

G-GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. *

**Visualize relationships between two-dimensional and three-dimensional objects.**

G-GMD.4 Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

G-GMD.5 **Know that the effect of a scale factor \(k\) greater than zero on length, area, and volume is to multiply each by \(k\), \(k^2\), and \(k^3\), respectively; determine length, area and volume measures using scale factors.** CA

G-GMD.6 Verify experimentally that in a triangle, angles opposite longer sides are larger, sides opposite larger angles are longer, and the sum of any two side lengths is greater than the remaining side length; apply these relationships to solve real-world and mathematical problems. CA

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**Modeling with Geometry**

**G-MG**

**Apply geometric concepts in modeling situations.**

G-MG.1 Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder). *

G-MG.2 Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). *

G-MG.3 Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios). *

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**EXPECTED INTEGRATED OUTCOMES**

(From the California Career Technical Education Model Curriculum Standards, adopted by the California State Board of Education in January, 2013)

Students are also expected to proficiently apply common skills that are relevant across curriculum areas and career pathways.
Standards for Career Ready Practice (CR)

1. Apply appropriate technical skills and academic knowledge.
Career-ready individuals readily access and use the knowledge and skills acquired through experience and education. They make connections between abstract concepts with real-world applications and recognize the value of academic preparation for solving problems, communicating with others, calculating measures, and performing other work-related practices.

2. Communicate clearly, effectively, and with reason.
Career-ready individuals communicate thoughts, ideas, and action plans with clarity, using written, verbal, electronic, and/or visual methods. They are skilled at interacting with others: they are active listeners who speak clearly and with purpose, and they are comfortable with terminology that is common to workplace environments. Career-ready individuals consider the audience for their communication and prepare accordingly to ensure the desired outcome.

3. Develop an education and career plan aligned with personal goals.
Career-ready individuals take personal ownership of their educational and career goals and manage their individual plan to attain these goals. They recognize the value of each step in the educational and experiential process, and they understand that nearly all career paths require ongoing education and experience to adapt to practices, procedures, and expectations of an ever-changing work environment. They seek counselors, mentors, and other experts to assist in the planning and execution of education and career plans.

4. Apply technology to enhance productivity.
Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring and using new technology. They understand the inherent risks - personal and organizational - of technology applications, and they take actions to prevent or mitigate these risks.

5. Utilize critical thinking to make sense of problems and persevere in solving them.
Career-ready individuals recognize problems in the workplace, understand the nature of the problems, and devise effective plans to solve the problems. They thoughtfully investigate the root cause of a problem prior to introducing solutions. They carefully consider options to solve a problem and, once agreed upon, follow through to ensure the problem is resolved.

6. Practice personal health and understand financial literacy.
Career-ready individuals understand the relationship between personal health and workplace performance. They contribute to their personal well-being through a healthy diet, regular exercise, and mental health activities. Career-ready individuals also understand that financial literacy leads to a secure future that enables career success.

7. Act as a responsible citizen in the workplace and the community.
Career-ready individuals understand the obligations and responsibilities of being a member of a community and demonstrate this understanding every day through their interactions with others. They are aware of the impacts of their decisions on others and the environment around them, and they think about the short-term and long-term consequences of their actions. They are reliable and consistent in going beyond minimum expectations and in participating in activities that serve the greater good.

8. Model integrity, ethical leadership, and effective management.
Career-ready individuals consistently act in ways that align with personal and community-held ideals and principles. They employ ethical behaviors and actions that positively influence others. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the direction and actions of a team or organization, and they recognize the short-term and long-term effects that management's actions and attitudes can have on productivity, morale, and organizational culture.
9. Work productively in teams while integrating cultural and global competence. Career-ready individuals contribute positively to every team, as both team leaders and team members. To avoid barriers to productive and positive interaction, they apply an awareness of cultural differences. They interact effectively and sensitively with all members of the team and find ways to increase the engagement and contribution of other members.

10. Demonstrate creativity and innovation. Career-ready individuals recommend ideas that solve problems in new and different ways and contribute to the improvement of the organization. They consider unconventional ideas and suggestions by others as solutions to issues, tasks, or problems. They discern which ideas and suggestions may have the greatest value. They seek new methods, practices, and ideas from a variety of sources and apply those ideas to their own workplace practices.

11. Employ valid and reliable research strategies. Career-ready individuals employ research practices to plan and carry out investigations, create solutions, and keep abreast of the most current findings related to workplace environments and practices. They use a reliable research process to search for new information and confirm the validity of sources when considering the use and adoption of external information or practices.

12. Understand the environmental, social, and economic impacts of decisions. Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact other people, organizations, the workplace, and the environment. They are aware of and utilize new technologies, understandings, procedures, and materials and adhere to regulations affecting the nature of their work. They are cognizant of impacts on the social condition, environment, workplace, and profitability of the organization.

COURSE CONTENT AND SUGGESTED TIME ALLOTMENT:
Content sequencing, activities, and time allocations are only suggestions and may be adjusted to suit school site curriculum plans, available materials, and student needs.

| Unit 1: Foundations of Geometry: Vocabulary, Reasoning and Tools |
| Duration: 37 days |

**Description:**
Using building blocks from Algebra 1, students will use a variety of tools and techniques to construct, understand, and prove geometric concepts and relationships. Unit 1 will set the foundation for this course in Accelerated Geometry as the students learn to use the vocabulary to communicate precisely and to use the appropriate tools to construct and transform figures effectively. Unit 1, also, includes the beginnings of geometric reasoning. The students will use these new skills to justify key relationships among lines and angles. Finally, the student will investigate the relationship between intersecting lines and their resultant angles. Parallel and/or perpendicular lines will be identified using the coordinate plane. Throughout this course, students will use basic tools, straightedge and compass, to develop their understanding of geometric relationships. Proofs will be a capstone for many of these units. Throughout this course, strict attention is paid to precise use of mathematical language.

**Required Assignment:**
**Checkerboard Borders**
http://blog.mrmeyer.com/2013/makeover-checkerboard-border/
Students work in small groups to generalize a way to calculate the number of colored tiles needed for a checkerboard border surrounding a square of tiles with dimensions s by s by writing an algebraic expression. The teacher then reviews their work, and creates questions for students to consider in order to improve their solutions. In a whole-class discussion, students review the mathematical concepts of the lesson.
Suggested Activities: See the Unit 1 Guide for Geometry ACC.

Materials: *Discovering Geometry* text: Chapters 1, 2 and 3


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Unit 2: Triangle and Polygon Properties

Duration: 34 days

Description:
Building on the algebra, reasoning, and constructions of Unit 1, Unit 2 has the students discover and explore the properties of triangles and polygons. As the students make conjectures and construct interior angles, exterior angles and congruencies of triangles, their new knowledge leads naturally to the study of polygons. As the students progress through their study of polygons, they will see that the properties of a polygon of one category hold for all the subcategories of that polygon. In paragraph, flowchart, and two-column proofs, students compose logical arguments to support their triangle and quadrilateral conjectures.

Required Assignment:
Evaluating Conditions for Congruency
This lesson assesses how well students are able to 1) work with concepts of congruency and similarity, including identifying corresponding sides and corresponding angles within and between triangles, 2) identify and understand the significance of a counter-example, and 3) prove and evaluate proofs in a geometric context. Before the lesson, students complete a task designed to assess their current levels of understanding. The teacher analyzes their responses and writes questions to help them improve their work. The lesson begins with a whole-class discussion about establishing conditions for congruency from triangle properties. Students work alone to decide on the truth of a conjecture about congruency conditions for triangles. Then in pairs they share ideas and produce and justify a joint response. Working in the same pairs, they analyze sample responses produced by other students. In a whole-class discussion, students develop their understanding of proof in this context. In a follow-up lesson students use what they have learned to improve their responses to the initial assessment task before attempting a second, similar task.

Suggested Activities: See the Unit 2 Guide for Geometry ACC.

Materials: *Discovering Geometry* text: Chapters 4, 5, and 13


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Unit 3: Transformations and Tessellations

Duration: 14 days

Description:
Geometric transformations have stepped to the forefront in the Common Core’s determination to make geometry accessible to every student. In this unit, students will employ transformational techniques (reflections, translations and rotations) to manipulate geometric figures while maintaining their size and shape. Similarity will be introduced as a product of dilation where the figure maintains the same shape, but now has a different size. Tessellations will be used to illustrate examples of real-world applications of transformations.
Required Assignment:  
Representing and Combining Transformations  

This lesson assesses how well students are able to recognize and visualize transformations of 2D shapes, translate, reflect and rotate shapes, and combine these transformations. Students work individually on an assessment task, Transforms, that is designed to reveal current levels of understanding and difficulties. The teacher then reviews their work, and creates questions for students to consider in order to improve their solutions. Then they work in small groups on a collaborative task. In a whole-class discussion, students review the mathematical concepts of the lesson. Students return to their original task, and try to improve their own responses.

Suggested Activities:  See the Unit 3 Guide for Geometry ACC.

Materials: Discovering Geometry text: Chapter 7

Standards Addressed: CCSS-M Clusters G-CO.A, G-CO.B

Unit 4: Circles

Duration: 18 days

Description:  
Strategically choosing their geometry tools, the students will continue their study of relationships, this time among angles and line segments in and around circles. Using the central angle, students discover how to calculate the measure of inscribed angles and arc lengths. The properties of angles and line segments build to the topics of circumference, diameter, chords, tangents and arc lengths. Students will prove circle theorems using a variety of formats.

Required Assignment:  
Calculating Arcs and Areas of Sectors of Circles  

This lesson unit is intended to help you assess how well students are able to solve problems involving area and arc length of a sector of a circle using radians. It assumes familiarity with radians and should not be treated as an introduction to the topic. This lesson is intended to help you identify and assist students who have difficulties in 1) computing perimeters, areas, and arc lengths of sectors using formulas, and 2) finding the relationships between arc lengths, and areas of sectors after scaling. Before the lesson, students work individually on an assessment task that is designed to reveal their current understanding and difficulties. You then review their solutions and create questions for students to consider, in order to improve their work. During the lesson, small groups work on a collaborative task matching cards according to the arc length, area, or perimeter of the sectors. After considering in the same small groups the general results of changing the radius and/or sector angle of a sector, there is a whole-class discussion. In a follow-up lesson, students review their initial solutions and then use what they have learned to either revise the same introductory assessment task or complete a different task.

Suggested Activities:  See the Unit 4 Guide for Geometry ACC.

Materials: Discovering Geometry text: Chapters 6 and 13

Standards Addressed: CCSS-M Clusters G-C.A, G-C.B, G-GMD.A
Unit 5: Area, the Pythagorean Theorem, and Volume

Duration: 32 days

Description:
Deriving new formulas from previously discovered ones, the students will leave Unit 5 with an understanding of area and volume formulas for polygons, circles and their three-dimensional counterparts. Unit 5 seeks to have the students develop and describe a process whereby they are able to solve for areas and volumes. The intention is to have students understand the genesis of the formulas and not have to depend on memorization. Units of measurement are emphasized as a method of checking one’s approach to a solution. Using their study of circles from Unit 3, the students will dissect the Pythagorean Theorem. Through this they will develop the properties of the special right triangles: 45°, 45°, 90° and 30°, 60°, 90°. Algebra skills from previous classes lead students to understand the connection between the distance formula and the Pythagorean Theorem. In all instances, surface area will be generated using the smaller pieces from which a given shape is constructed. The student will, again, derive new understandings from old ones.

Required Assignment:
Calculating Volumes of Compound Objects
This lesson assesses how well students solve problems involving measurement and in particular, identifies and helps students who have difficulty 1) computing measurements using formulas, 2) decomposing compound shapes into simpler ones, and 3) using right triangles and their properties to solve real-world problems. Before the lesson, students attempt the task individually. You then review their work and formulate questions for them to answer, in order to improve their work. At the start of the lesson, students work individually to answer your questions. Next, they work in small groups on the same task, to produce better collective solutions than those they produced individually. Throughout their work they justify and explain their decisions to each other. In the same small groups, students critique some student responses to the Glasses task, provided in the Sample Responses to Discuss. They correct errors in those responses. In a whole-class discussion, students discuss their own solutions and explain how to correct the common misconceptions seen in the Sample Responses to Discuss. Finally, students work on their own again to improve their individual solutions.

Suggested Activities: See the Unit 5 Guide for Geometry ACC.

Materials: Discovering Geometry text: Chapters 8, 9 and 10


Unit 6: Similarity and Trigonometry

Duration: 34 days

Description:
After reviewing proportions, students begin Unit 6 exploring, and ultimately proving, some of the basic properties of similarity, a term they will define precisely for triangles and polygons. After being introduced to dilation, students will discover the linear, area and volume relationships between similar figures. Using triangle similarity, students will expand their knowledge of mathematical definitions to include sine, cosine and tangent. An introduction to the Law of Sines and the Law of Cosines will set the students up for later courses in Algebra 2 and Precalculus. Students will finish Unit 6, and the school year, exploring indirect proof techniques.

Required Assignment:
Deducing Relationships: Floodlight Shadows
This lesson unit is intended to assess how well students are able to identify and use geometrical knowledge to solve a problem. In particular, it aims to identify and help students who have difficulty in 1) making a mathematical model of a geometrical situation, 2) drawing diagrams to help with solving a problem, 3) identifying similar triangles and using their properties to solve problems, and 4) tracking and reviewing strategic decisions when problem-solving. Before the lesson, students attempt an assessment task individually. The teacher reviews their solutions and formulates questions to help them improve their work. At the start of the lesson, students work individually answering the questions. They then work collaboratively in pairs or threes to produce a joint solution to the same task. They justify and explain their chosen method. Working in the same small groups, they critique examples of other students’ work on the task. In a whole-class discussion, students explain and compare the alternative approaches they have seen and used. In a follow-up lesson, students work individually to reflect on what they have learned.

Suggested Activities: See the Unit 6 Guide for Geometry ACC.

Materials: Discovering Geometry text: Chapters 11 and 12


INSTRUCTIONAL METHOD AND/OR STRATEGIES:
A variety of instructional strategies will be utilized to accommodate all learning styles. See the “Using Formative Assessment to Address the Specific Learning Needs of Low Achieving Students, High Achieving Students, Students with Disabilities and English Language Learners in K-12 MATHEMATICS” document.

COURSE MATERIALS:
Core Text: Discovering Geometry, Serra, Kendall Hunt, © 2013
Supplemental Materials: In addition to the basic text, a variety of instructional tools will be used to meet the needs of all students.

RESOURCES:

Documents
- LBUSD Scope and Sequence............................................................LBUSD Mathematics Webpage
- LBUSD Unit Guides ..................................................................LBUSD Mathematics Webpage
- LBUSD Instructional Tools ......................................................LBUSD Mathematics Curriculum Intranet
- Using Formative Assessment for Differentiation..................LBUSD Math/ELA Curriculum Documents
- Work-Based Learning Continuum ........................................LBUSD Work-Based Learning Webpage
- ELD Standards ........................................................................http://www.cde.ca.gov/sp/el/er/eldstandards.asp

District Offices
- Math Curriculum Office ...............................................................(562) 997-8000, ext. 2962
- Research Office ........................................................................(562) 997-8143

PERFORMANCE CRITERIA:
Defines how good is good enough on which measures to demonstrate achievement of content standards.

Classroom Performance Standards
The objective of instruction is to help all students achieve at or above the Proficient Level and receive a C or better in the course.
<table>
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<th>F</th>
<th>D</th>
<th>C</th>
<th>B</th>
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<tr>
<td>Assessments</td>
<td>0 – 59%</td>
<td>60 – 69%</td>
<td>70 – 79%</td>
<td>80 – 89%</td>
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<td>Classwork</td>
<td>0 – 59%</td>
<td>60 – 69%</td>
<td>70 – 79%</td>
<td>80 – 89%</td>
<td>90 – 100%</td>
</tr>
<tr>
<td>Homework</td>
<td>0 – 59%</td>
<td>60 – 69%</td>
<td>70 – 79%</td>
<td>80 – 89%</td>
<td>90 – 100%</td>
</tr>
</tbody>
</table>

**Standard Grading Scale:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 – 100%</td>
</tr>
<tr>
<td>B</td>
<td>80 – 89%</td>
</tr>
<tr>
<td>C</td>
<td>70 – 79%</td>
</tr>
<tr>
<td>D</td>
<td>60 – 69%</td>
</tr>
<tr>
<td>F</td>
<td>0 – 59%</td>
</tr>
</tbody>
</table>

**Suggested Grade Weighting:**

1. **Assessment** 60 – 80%
   - Graded work assessing a student’s mastery of mathematics such as any of the following:
     - Tests (district exams and classroom tests)
     - Quizzes
     - Project work that assesses a student’s understanding

2. **Classwork/Activities** 10 – 25%
   - Graded work completed in class such as any of the following:
     - In class assignments
     - Project work completed in class
     - Notes
     - Warm-ups
     - Graded participation

3. **Homework** 5 – 15%
   - Graded work completed outside of class such as any of the following:
     - Assignments
     - Project work completed outside of class

Submitted by: Becky Afghani
Submission Date: August 24, 2015
School/Office: Math Curriculum Office

Original Board Approval Date: November 3, 2015
Revised Board Approval Date: