Alternative Accelerated CC Math 6/7 – UNIT 3
Geometry

Critical Area: Students in Grade 6 also build on their work with area in elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane. Students continue their work with area from Grade 6, solving problems Involving the area and circumference of a circle and surface area of three-dimensional objects. Students reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with relationships between angles formed by Intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Rational: Students use prior core geometrical knowledge reasoning to further build on and apply geometric and spatial thinking as it applies other mathematical domains and real world problems. By introducing geometry earlier we can use the properties of geometry to create a meaningful link between ratios and proportional relationships, number systems, and expressions and equations. In this course, standard 6.G.1 is a foundation standard that will be used and revisited thought the different grade levels. It is essential that students have a fundamental understanding of composing and decomposing figures and incorporate other domains to solve real world problems. Geometry should be spread out throughout and continually spiraled through all of the units as recommended in those units in order for students to make the connections between real-world applications and the application of the other units as applied through geometry.

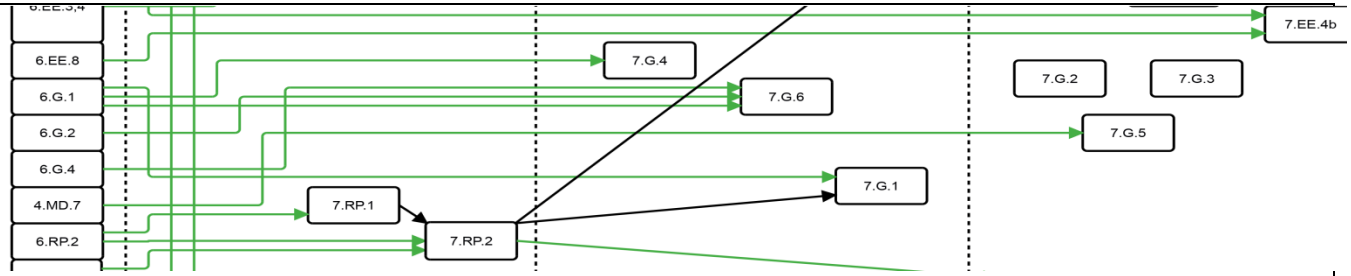
CLUSTERS	PREREQUISITE COMMON CORE STATE STANDARDS
Solve real-world and mathematical problems involving area, surface area, and volume. **Geometry** **Draw, construct, and describe geometrical figures and describe the relationships between them**.	6.G.1. Find the area of right triangles, other triangles, 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. **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. 6.G.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Geometry **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.3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. 6.G.4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. **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. **7.G.3**. Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. **7.G.*3.1 Describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect).*** **7.G.4**. 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. **7.G.5**. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure. **7.G.6**. Solve real-world and mathematical problems involving area, volume and surface area of two- and three dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
STANDARDS	PREREQUISITE COMMON CORE STATE STANDARDS
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. **7.G.1**. Solve problems involving scale	4.MD.3Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor*. 5.NF.4 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

drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	fraction products as rectangular areas. 6.G.1 6.RP.2 6.RP.3 7.RP.1 7.RP.2
6.G.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. 6.G.3. Draw polygons in the coordinate	Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume. 5.MD.5a Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. 5.MD.5B Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems. 5.G.2 Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. 6.NS.8

plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. 6.G.4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	4.MD.3 Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor. 5.NF.4 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.G.1
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. 7.G.3. Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids ***7.G.3.1 Describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect)***	4.G1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. 5.G.3 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

7.G.4. 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. **7.G.5**. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure. 7.G.6. Solve real-world and mathematical problems involving area, volume and surface area of two- and three dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	**6.G.1** **4.MD.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure** **6.G.4** **6.G.2** **6.G.1**
	Learning Progressions
	Geometry **http://commoncoretools.files.wordpress.com/2012/06/ccss_progression_g_k6_2012_06_27.pdf** **CDE** **http://www.cde.ca.gov/be/st/ss/documents/ccssmathstandardaug2013.pdf#search=math%20common%20core%20standards&view=FitH&pagemode=none** **Wire diagram**



ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS	KEY VOCABULARY
Geometry: Learning geometry cannot progress in the same way as learning number, where the size of the numbers is gradually increased and new kinds of numbers are considered later. In learning about shapes, it is important to vary the examples in many ways so that students do not learn limited concepts that they must later unlearn.. In grade 6 students work on problems involving areas and volumes and extend previous work and provide a context for developing and using equations. . Building on the knowledge of volume. Students learn to find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. They develop visualization skills connected to their mathematical concepts as they recognize the existence of, and visualize, components of three-dimensional shapes that are not visible from a given viewpoint. They measure the attributes of these shapes, allowing them to apply area formulas to solve surface area problems. They learn to plan the construction of complex three-dimensional compositions through the creation of	**Geometry:** What is perimeter, area, circumference, and how are they related? How is geometry used in our world? How is space measured?	**Geometry:** Area, square units Surface Area Volume Triangles, Quadrilaterals, Polygons Edge Length, face, vertex, edge, net, prism, surface area volume, cubic units coordinate plane, x-axis, y-axis, quadrants, ordered pair, counterclockwise, origin, x-coordinate, y-coordinate

corresponding two-dimensional nets. Students extend their understanding of properties of two-dimensional shapes to use of coordinate systems.		

RESOURCES	INSTRUCTIONAL STRATEGIES	ASSESSMENT
Teaching and Learning Framework http://illuminations.nctm.org/	• Real world connections • Structured instructional conversations • Use visuals and physical model of shapes • Use of Language frames for classroom communication • Encourage Student to student questioning	SBAC - http://www.smarterbalanced.org/ PARCC - http://parcconline.org/samples/mathematics/grade-6-slider-ruler

LANGUAGE GOALS

Students will recognize and write statistical questions. How old am I?" is not a statistical question, but "How old are the students in my school?"
Students will explain the meaning of statistical distribution.
Students will compare and contrast the differences between measure of center for a numerical data and variation.
Example: Measure of central tendency is_____ and variability describes how_____.
Students will discuss and write how to determine the area of right triangles, other triangles, special quadrilaterals, and polygons.
Example: When I find the area of my rectangular classroom floor, I _____ the length by the _____.
Students will apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths.

PERFORMANCE TASKS
Statistics and Probability: **Inside Mathematics** ***Statistics and Probability (SP)*** **6.SP.1, SP.4, SP.5**- Through the Grapevine: Problem of the Month http://insidemathematics.org/problems-of-the-month/pom-throughthegrapevine.pdf **6.SP.2** - Pick a Pocket: Problem of the Month http://insidemathematics.org/problems-of-the-month/pom-pickapocket.pdf **6.SP.3, SP.5** - Baseball Players: Task http://insidemathematics.org/common-core-math-tasks/6th-grade/6-2003%20Baseball%20Players.pdf
Geometry: **Mathematics Assessment Project** 6.G and MP1,3,4 – Designing Candy Cartons http://map.mathshell.org/materials/lessons.php Fruit Boxes http://map.mathshell.org/materials/download.php?fileid=802 Smoothie Box http://map.mathshell.org/materials/tasks.php?taskid=392#task392 Candy Bars http://map.mathshell.org/materials/tasks.php?taskid=396#task396 Suzi's Company http://map.mathshell.org/materials/tasks.php?taskid=383#task383 Research Development and Accountability 6G – Triangle Try Outs http://www.rda.aps.edu/mathtaskbank/pdfs/tasks/6-8/t68TriTryOut.pdf **Inside Mathematics** **6.G.1** Polly Gone: Problem of the Month http://insidemathematics.org/problems-of-the-month/pom-pollygone.pdf **6.G.2** - Building Blocks: Task http://insidemathematics.org/common-core-math-tasks/6th-grade/6-2007%20Building%20Blocks.pdf

DIFFERENTIATION📖		
FRONT LOADING	ACCELERATION	INTERVENTION
Geometry: • Students should be provided opportunities prior to the lesson to develop apply and extend competencies in shape composition and decomposition, especially with spatial structuring of rectangular arrays. • Apply and understand previous understandings of the coordinate plane to graphs • Apply, understand and extend previous understandings of areas polygons to more complex geometric,	Relate the area of study to other subjects within, between, and across disciplines. Such as in, Geography and Environmental Literacy Students apply knowledge and understanding of data collection to answer questions regarding – the emergence and expansion and decline of civilizations, societies and regions	• Small teacher to student ratio discussion • Emphasize think-pair-share • Build the 2-D AND 3-D geometric figures to give students the opportunity to make connections between the real and the abstract • Make connections to real life • • Use Physical Objects to demonstrate the math. In geometry : Such as cones, squares,

including prisms.	LEARN NC Interdisciplinary Math and Social Studies, Gridding an archaeological dig site http://www.learnnc.org/lp/pages/1005	etc • In probability and statistics: Census data, experimental results

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