Curriculum Development Overview
Unit Planning for 7th Grade Mathematics

Unit Title	3-D Required			**Length of Unit**	5 weeks
Focusing Lens(es)	Relationships Visualization	**Standards and Grade Level Expectations Addressed in this Unit**	MA10-GR.7-S.4-GLE.1 MA10-GR.7-S.4-GLE.2		
Inquiry Questions (Engaging-Debatable):	• Why is pi an important number? (MA10-GR.7-S.4-GLE.2-IQ.8) • How many two-dimensional shapes can you make by slicing a three-dimensional object?				
Unit Strands	Geometry				
Concepts	Circumference, area, circle, diameter, π, ratio, radius, slice, three-dimensional figures, two-dimensional figures, scale factor, magnification, zoom level, scale drawings, characteristics, drawing, tools (rulers, protractors, compasses), complementary, supplementary, adjacent, vertical, angles, indirect measurement, additive property, area, volume, decomposition, composition				

Generalizations **My students will Understand that…**	**Guiding Questions** **Factual**	**Conceptual**
Mathematicians recognize the special relationship between the diameter and circumference of a circle as the ratio called π, and utilize this relationship to calculate the area, circumference, diameter or radius of a circle. (MA10-GR.7-S.4-GLE.2-EO.a, b)	What is the radius? What is the formula for finding the circumference of a circle? What is the formula for finding the area of a circle? What is π?	How are the circumference and diameter of a circle related? How does the derivation of the formula for the area of a circle rely on both the circumference and radius of the circle?
Slicing three-dimensional figures results in two-dimensional figures (MA10-GR.7-S.4-GLE.1-EO.a.iv)	What types of two-dimensional figures can be created when slicing a cone?	How does slicing a 3-D shape parallel to the base differ from slicing the same 3-D shape diagonal to the base?
Mathematicians represent scale factor in terms of magnification or zoom level. (MA10-GR.7-S.4-GLE.1-EO.a.i)	How does scale factor affect length, perimeter, angle measure, area, and volume? (MA10-GR.7-S.4-GLE.1-IQ.3)	Why is the scale factor for side lengths and perimeters different from the one for areas?
Mathematicians draw geometric figure using rulers, protractors, and compasses with precision (MA10-GR.7-S.4-GLE.1-EO.a.ii, a.iii)	How is sketching different from drawing? When drawing triangles, when do provided characteristics lead to no triangle, exactly one or more than one possible triangle? Is there a geometric figure for any given set of attributes? (MA10-GR.7-S.4-GLE.1-IQ.1)	Why are rulers, protractors and compasses necessary when drawing shapes?

Angle relationships such as complementary, supplementary, adjacent and vertical angles provide mathematicians an indirect means to solve for unknown angles in a figure (MA10-GR.7-S.4-GLE.2-EO.c)	What are complementary angles? What are supplementary angles? What are adjacent angles? What are vertical angles? How do line relationships affect angle relationships?	How can you indirectly determine the measurement of an unknown angle formed by two intersecting lines? How can geometric relationships among lines and angles be generalized, described, and quantified? (MA10-GR.7-S.4-GLE.2-IQ.1)
The additive property of area and volume provides a means for deriving equations to find the surface area and volume of two -and three-dimensional objects (MA10-GR.7-S.4-GLE.2-EO.d)	What are examples of familiar shapes that are helpful to recognize within larger objects when trying to find volumes or surface areas? What do surface area and volume tell about an object? (MA10-GR.7-S.4-GLE.2-IQ.6)	Why area and volume both have additive properties of composition and decomposition? How can two shapes have the same volume but different surface areas and vice versa? (MA10-GR.7-S.4-GLE.2-IQ.2, 3)

Key Knowledge and Skills: **My students will…**	*What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.*

- 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. (MA10-GR.7-S.4-GLE.1-EO.a.i)
- Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given condition, with focus on triangles from three measures of angles or sides, noting when the conditions determine a unique triangle, more than one triangle, or no triangle. (MA10-GR.7-S.4-GLE.1-EO.a.ii, a.iii)
- Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. (MA10-GR.7-S.4-GLE.1-EO.a.iv)
- Know the formulas for the area and circumference of a circle and use them to solve problems (MA10-GR.7-S.4-GLE.2-EO.a)
- Give an informal derivation of the relationship between the circumference and area of a circle. (MA10-GR.7-S.4-GLE.2-EO.b)
- 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. (MA10-GR.7-S.4-GLE.2-EO.c)
- 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. (MA10-GR.7-S.4-GLE.2-EO.d)

Critical Language: includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline.
EXAMPLE: A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: *"Mark Twain exposes the hypocrisy of slavery through the use of satire."*

A student in _____ can demonstrate the ability to apply and comprehend critical language through the following statement(s):	*The area of a circle is derived by cutting the circle like a pizza into successively smaller slices and rearranging to form a parallelogram with a base that is half the circumference and a height of the radius.*
Academic Vocabulary:	Solve, draw, freehand, ruler, protractor, triangle, area, circle, angles, polygons cubes, slice, three-dimensional figures, two-dimensional figures, scale factor, magnification, zoom level, scale drawings, characteristics, volume, derive, parallelogram
Technical Vocabulary:	Circumference, diameter, π, ratio, radius, drawing, tools (rulers, protractors, compasses), complementary angles, supplementary angles, adjacent angles, vertical angles, indirect measurement, additive property, decomposition, composition, congruent quadrilateral, right prisms