Rigorous Curriculum Design
Unit Planning Organizer

Subject:	Math 7			Grade:	7
Unit Number:	3	Unit Name:	**Geometric Shapes**		
Unit Length	Weeks: 4 ± 1 buffer		Mins / Day: 57		
Unit Synopsis	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. In preparation for work on congruence and similarity in grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the 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.				

	Math CCSS
Priority Standards	7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. 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 for Mathematical Practice
SMP	☐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
Supp	**Math CCSS**

7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

7.EE.4a Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

7.EE.4b Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.

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.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.

	Literacy/Science/ History/Other	NG ELD Standards
Interdisciplinary Connections		**ELD.7.I.C.10** - Writing literary and informational texts to present, describe, and explain ideas and information, using appropriate technology **ELD.7.I.C.12** - Selecting and applying varied and precise vocabulary and other language resources to effectively convey ideas **ELD.7.I.B.6** - Reading closely literary and informational texts and viewing multimedia to determine how meaning is conveyed explicitly and implicitly through language **ELD.7.I.B.7** - Evaluating how well writers and speakers use language to support ideas and arguments with details or evidence depending on modality, text type, purpose, audience, topic, and content area

Unwrapped Priority Standards

Standard:	7EE4 **Use** <u>variables to represent quantities in a real-world or mathematical problem, and</u> <mark>construct</mark> <u>simple equations and inequalities</u> <mark>to solve</mark> <u>problems</u> <mark>by reasoning</mark> <u>about the quantities</u>.			
Skills	**Concepts**	**Bloom's**	**DOK**	**Language Demand**
Use	**Variables to represent quantities in a real-world or mathematical problem**	**Bloom's 2**	**DOK 1**	Productive C12 (variables)
construct	**simple equations and inequalities**	**Bloom's 3**	**DOK 3**	Productive C10 (equation or inequality)
to solve	**problems**			Productive C10 (numerical answer)
by reasoning	**about the quantities**			Interpretive B7 (quantities)

Essential Question(s)	Big Idea(s)
What is a variable and how can you use variables in real life?	Equations and inequalities are a good tool to solve for an unknown quality in real life situations.

Standard:	7G5 <mark>Use</mark> <u>facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem</u> <mark>to write and solve</mark> <u>simple equations for an unknown angle in a figure</u>.			
Skills	**Concepts**	**Bloom's**	**DOK**	**Language Demand**
Use	**facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem**	**Bloom's 3**	**DOK 2**	Interpretive B6 (Angle Facts)
to write	**simple equations for an unknown angle in a figure**	**Bloom's 3**	**DOK 2**	Productive C10 (equation, numerical answer)
to solve	**simple equations for an unknown angle in a figure**	**Bloom's 3**	**DOK 1**	

Essential Question(s)	Big Idea(s)
How are angles related? Give examples. (What different relationships do you have? Trying to connect to real world. Building something?)	There are relationships between angles that we can use to solve for an unknown angle.

Standard:	**7G6 <mark>Solve</mark> 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.**

Skills	Concepts	Bloom's	DOK	Language Demand
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.**	**Bloom's 3**	**DOK 2**	Productive C10 (numerical answer)

Essential Question(s)	Big Idea(s)
How do you calculate how much paint needed to paint a room?	The correct formula is needed to solve real world problems

Learning Progressions

Standard:	7 EE 4				
Previous Grade		Current Grade		Next Grade	
Skills	Concepts	Skills	Concepts	Skills	Concepts
6 EE 7 SOLVE	Real world and mathematical problems	**Use**	**Variables to represent quantities in a real-world or mathematical problem**	8 EE 8c Solve	real-world and mathematical problems leading to linear equations in two variables
6 EE 7 BY WRITING	Equations of the form x + p = q and px=q for cases in which p, q, and x are all nonnegative rational numbers.	**construct** **to solve** **by reasoning**	**simple equations and inequalities** **problems** **about the quantities**	8 EE 7 Solve To expand	linear equations with rational number coefficients including equations whose solutions require expanding expressions using the distributive property and collecting like terms

Standard:	7 G 5	
Previous Grade	Current Grade	Next Grade

Skills	Concepts	Skills	Concepts	Skills	Concepts
6 EE 7 Solve	Equations of the form x + p = q and px=q for cases in which p, q, and x are all nonnegative rational numbers.	**Use** **to write** **to solve**	**facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem** **simple equations for an unknown angle in a figure** **simple equations for an unknown angle in a figure**	8 G 5 Use	Informal arguments to establish facts about the angle sum and exterior angle of triangles

Standard:	7 G 6				
Previous Grade		Current Grade		Next Grade	
Skills	Concepts	Skills	Concepts	Skills	Concepts
6 G 1 Find 6 G 2 Find 6 G 4 Find	The area of right triangles, other triangles, special quadrilaterals, and polygons the volume of a right rectangular prism with fractional edge lengths the surface area	**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.**	8 G 9 Know	The formulas for the volumes of cones, cylinders, spheres

Unit Vocabulary Words	
Academic Cross-Curricular Vocabulary (Tier 2)	Content/Domain Specific Vocabulary (Tier 3)
Use Construct Solve Reason Write Apply	Variables Quantities Equations Inequalities Supplementary angles Complementary angles Vertical angles Adjacent angles Area Volume

	Surface Area
	Triangles
	Quadrilaterals
	Cubes
	Right Prisms
	Graph
	Two-dimensional
	Three-dimensional
	Plane section
	Circumference
	Circle

Resources for Vocabulary Development (Strategies, Routines and Activities)

Word Wall
Flash Cards
Graphic Organizer
      Examples & Non-examples
      Sentence Frames
      The Frayer Model
      Word Pyramid
      Concept Map
Targeted Vocabulary Partner Activity

21st Century Skills	
☐Creativity and Innovation	☐Initiative and Self-Direction
☐Critical Thinking and Problem Solving	☐Social and Cross-Cultural Skills
☐Teamwork and Collaboration	☐Productivity and Accountability
☐Flexibility and Adaptability	☐Leadership and Responsibility
☐Globally and Financially Literate	☐Curiosity and imagination
☐Effective Oral and Written Communication	☐Accessing and Analyzing Information

Connections between 21st Century Skills, CCCSS, and Unit Overview:

Costa & Kallick, 2008

Unit Assessments	
Pre-Assessment	Post-Assessment
Go to http://www.alvordschools.org/Page/2698 for the EADMS ID numbers	Go to http://www.alvordschools.org/Page/2698 for the EADMS ID numbers
Scoring Guides and Answer Keys	
Go to http://www.alvordschools.org/Page/2698 for the EADMS ID numbers	Go to http://www.alvordschools.org/Page/2698 for the EADMS ID numbers
Assessment Differentiation	

Students with Disabilities	***Accommodations*** Reference IEP to ensure appropriate testing environment Allow students to use notes ***Modifications*** Refer to each students' individual IEPs	English Language Learners	Emerging Allow students to use notes
			Expanding Use sentence frame for constructed response items.

Engaging Scenario Overview (Situation, challenge, role, audience, product or performance)	
Description:	Suggested Length of Time Days: Mins/Day:
Engaging Learning Experiences Synopsis of Authentic Performance Tasks	

Authentic Performance Tasks	Description	Suggested Length of Time
Task 1:		Days: Mins/Day:
Task 2:		Days: Mins/Day:
Task 3:		Days: Mins/Day:

Task 4:		Days:
		Mins/Day:

Authentic Performance Task 1

Name:		Suggested Length	Days: Mins/Day:

Standards Addressed	Priority Standards
	CCCSS Math
	Standards for Mathematical Practice
	☐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
	Supporting Standards
	CCCSS Math

	Literacy/Science/ History/Other	NG ELD Standards	
Interdisciplinary Connections			

		Bloom's	DOK
Teaching and Learning Progression			
		Scoring Rubric	

Instructional Strategies			
All Students	SWD	ELs	Enrichment
Graphic organizer Use of calculators	*Accommodations* Refer to each students' individual IEPs *Modifications* Refer to each students' individual IEPs	Emerging Clarification of directions by aide or peer in primary language	
		Expanding Clarification of directions by teacher in English	
		Bridging Clarification of directions by student to the teacher	

Authentic Performance Task 2

Name:		Suggested Length	Days: Mins/Day:
Standards Addressed	Priority Standards		
	CCCSS Math		

Standards for Mathematical Practice

☐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

Supporting Standards

CCCSS Math

Interdisciplinary Connections	Literacy/Science/ History/Other

NG ELD Standards

	Bloom's	DOK
Teaching and Learning Progression		

Scoring Rubric

Instructional Strategies			
All Students	SWD	ELs	Enrichment
Graphic organizer Use of calculators	*Accommodations* Refer to each students' individual IEPs *Modifications* Refer to each students' individual IEPs	Emerging Clarification of directions by aide or peer in primary language	
		Expanding Clarification of directions by teacher in English	
		Bridging Clarification of directions by student to the teacher	

Authentic Performance Task 3

Name:		Suggested Length	Days: Mins/Day:
Standards Addressed	Priority Standards		
	CCCSS Math		
	Standards for Mathematical Practice		

	☐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

Supporting Standards
CCCSS Math

	Literacy/Science/ History/Other	NG ELD Standards
Interdisciplinary Connections		

		Bloom's	DOK
Teaching and Learning Progression			
		Scoring Rubric	

Instructional Strategies			
All Students	SWD	ELs	Enrichment
Graphic organizer Use of calculators	***Accommodations*** Refer to each students' individual IEPs	Emerging Clarification of directions by aide or peer in primary language	

		Expanding Clarification of directions by teacher in English	
Modifications Refer to each students' individual IEPs		Bridging Clarification of directions by student to the teacher	

Authentic Performance Task 4

Name:		Suggested Length	Days: Mins/Day:
Standards Addressed	Priority Standards		
	CCCSS Math		
	Standards for Mathematical Practice		
	☐ 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		
	Supporting Standards		
	CCCSS Math		

	Literacy/Science/ History/Other	NG ELD Standards
Interdisciplinary Connections		

Teaching and Learning Progression		Bloom's	DOK
		Scoring Rubric	

Instructional Strategies			
All Students	SWD	ELs	Enrichment
Graphic organizer Use of calculators	***Accommodations*** Refer to each students' individual IEPs ***Modifications*** Refer to each students' individual IEPs	Emerging Clarification of directions by aide or peer in primary language	
		Expanding Clarification of directions by teacher in English	
		Bridging Clarification of directions by student to the teacher	

Engaging Scenario

Detailed Description (situation, challenge, role, audience, product or performance)			
Instructional Strategies			
All Students	SWD	ELs	Enrichment
Graphic organizer Use of calculators	*Accommodations* Refer to each students' individual IEPs *Modifications* Refer to each students' individual IEPs	Emerging Clarification of directions by aide or peer in primary language	
		Expanding Clarification of directions by teacher in English	
		Bridging Clarification of directions by student to the teacher	

Feedback to Curriculum Team

Reflect on the teaching and learning process within this unit of study. What were some successes and challenges that might be helpful when refining this unit of study?	
Successes	Challenges
Student Perspective	
Teacher Perspective	