

NJDOE MODEL CURRICULUM PROJECT

CONTENT AREA: Math

GRADE: 7

UNIT #: 5

UNIT NAME: Geometry

Anticipated ending: First week in June

STUDENT LEARNING OBJECTIVES		CORRESPONDING CCSS	
1	Use variables to represent quantities in a real-world or mathematical problem; write and fluently solve simple equations and inequalities, interpret the solutions in the context of the problem and graph the solution set on a number line. [Please note this unit addresses standard 7.EE.4 again to assess fluency.]	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. a. 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? 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.
2	Use tools strategically to solve multi-step real-world and mathematical problems involving positive and negative rational numbers in any form (converting between forms as needed) and determine the reasonableness of the answers. [Please note this unit addresses standard 7.EE.3 again to assess fluency.]	7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation

3	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.	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.
		7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation
		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. b. 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? 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.
4	Write and solve simple algebraic equations involving supplementary, complementary, vertical, and adjacent angles for multi-step problems and finding the unknown measure of an angle in a figure.	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.
5	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.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.

6	Describe, using drawings or written descriptions, the 2-dimensional figures that result when 3-dimensional figures (right rectangular prisms and pyramids) are sliced from multiple angles given both concrete models and a written description of the 3-dimensional figure.	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.
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Major Content Supporting Content Additional Content (Identified by PARCC Model Content Frameworks). ***Bold type indicates grade level fluency requirements.*** (Identified by PARCC Model Content Frameworks).

Selected Opportunities for Connection to Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. **Reason abstractly and quantitatively.**
SLO 4 Represent problems involving geometric concepts algebraically.
3. Construct viable arguments and critique the reasoning of others.
4. **Model with mathematics.**
SLO 3 Use geometric models of 3-D objects.
5. **Use appropriate tools strategically.**
SLO 2 Represent problems involving real-world circumstances using the number line.
6. Attend to precision.
7. Look for and make use of structure.
8. **Look for and express regularity in repeated reasoning.**
SLO 5 Apply the correct formula when solving problems .

All of the content presented at this grade level has connections to the standards for mathematical practices.

Bold type identifies possible starting points for connections to the SLOs in this unit.

Greater Brunswick Charter School Curriculum

Grade level: 7		Subject: Math			Unit #: 5		
Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
1	Geometry		To determine geometry learning readiness	<i>How much about geometry do I already know?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath p.532-534
2	Angles	4	To classify angles by position	<i>What do I call angles that are connected somehow?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath 7-1 p.535-542
3	Putting angles together	1, 4	To identify complementary and supplementary angles	<i>If I have one angle and know it is complementary to another, how can I find the measure of the other angle?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath 7-2 p.543-550
4	Making triangles		To determine if three sides make a triangle	<i>What do I need in three line segments to make a triangle?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath p.551-554
5	Triangles		To classify triangles by their angles and side lengths	<i>What do I need to look for to label a triangle a specific type?</i>	<i>Skip the upcoming Inquiry Lab assuming you don't have Geometer's Sketchpad</i>	<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath 7-3 p.555-562
6	Models	1, 2	To use drawing to help solve problems	<i>How can drawings help me see the answer?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath p.567-570
7	Scale	1, 2	To solve real-world problems involving scale	<i>How can I know how far something is from a map on paper?</i>	<i>The use of scales practice is in support of SLOs 1, 2 and 3</i>	<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath p.571-574
8	Scale drawings	1, 2, 3	To interpret and make scale drawings using a scale factor	<i>How can I make small drawings of big areas?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath 7-4 p.575-582

Grade level: 7			Subject: Math			Unit #: 5	
Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
9	Angles, scale, problem solving	1, 2, 3, 4	To determine mastery of content and skills	<i>How much about angles and scale do I know to know what to do?</i>		<ul style="list-style-type: none"> Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath p.570, 583-584
10	Angles, scale, problem solving	1, 2, 3, 4	Assessment			<ul style="list-style-type: none"> Review Assessment 	
11	3-dimensional figures	6	To draw and interpret views of 3-D figures	<i>How can I envision a set of 2-dimensional figures into a 3-dimensional figure?</i>		<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath 7-5 p.585-592
12	Cross-sections	6	To identify specific 3-dimensional figures	<i>What characteristics help me to label a 3-D figure?</i>		<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath 7-6 p.593-600
13	Classifying figures	1, 2, 3, 4	To determine master of content and skills			<ul style="list-style-type: none"> Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath p.603-606
14	Classifying figures	1, 2, 3, 4	Assessment		<i>Suggest a retest of the entire chapter thus far.</i>	<ul style="list-style-type: none"> Review Assessment 	
15	<ul style="list-style-type: none"> Measuring figures Circumference 	4, 5	<ul style="list-style-type: none"> Determine readiness for calculations involving figures Discover the relation between diameter and circumference 	<i>How much of this have I already done and know?</i>	<i>Do the circumference discovery only if you want to mess with string.</i>	<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath p.608-610, 611-612
16	Circumference	5	To compute the circumference, diameter, or radius of a circle given one of the measures	<i>How can I use algebra to solve circle geometry unknowns?</i>		<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath 8-1 p.613-618
17	Circumference	5	To compute the circumference, diameter, or radius of a circle given one of the measures	<i>How can I use algebra to solve circle geometry unknowns?</i>		<ul style="list-style-type: none"> Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath 8-1 p.619

Grade level: 7

Subject: Math

Unit #: 5

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
18	Area of a circle	3, 5	To discover the formula for the area of a circle	<i>How are the area of a circle, its circumference, and its radius related?</i>		<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath p.621-622
19	Area of a circle	3, 5	<ul style="list-style-type: none"> To calculate the area of a circle To find a missing measure given another 	<i>How can I find the area of a figure when I can't count the unit squares inside of it?</i>		<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath 8-2 p.623-627
20	Area of a circle	3, 5	<ul style="list-style-type: none"> To calculate the area of a circle To find a missing measure given another 	<i>How can I find the area of a figure when I can't count the unit squares inside of it?</i>		<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath 8-2 p.629-630
21	Area of composite figures	3, 5	To calculate the area of figures composed of more than one figure	<i>How can I find the area of the whole by finding the area of the pieces?</i>		<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath 8-3 p.631-635
22	Area of composite figures	3, 5	To calculate the area of figures composed of more than one figure	<i>How can I find the area of the whole by finding the area of the pieces?</i>		<ul style="list-style-type: none"> Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath 8-3 p.637-638
23	Circumference and area of circles and composite figures	3, 5	<ul style="list-style-type: none"> To find all other measures given one measure of a circle To find the area of composite figures 	<i>Do I know enough about these skills to use them when I need to use them?</i>		<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath p.650, #1-5
24	Circumference and area of circles and composite figures	3, 5	Assessment			<ul style="list-style-type: none"> Review Assessment 	

Grade level: 7			Subject: Math		Unit #: 5		
Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
25	Volume of prisms	3	To find the volume of a prism by counting unit cubes and by formula	<i>How can I find the volume of a figure for which I know the base?</i>	<p><i>Keep in mind, volume of any figure is almost always the same basic formula: Area of the base x height. It's only the area of the base formula that changes.</i></p> <p><i>You can start with prisms and do pyramids the second day, but the text doesn't make it easy to parse the assignments.</i></p>	<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath 8-4 p.639-644
26	Volume of prisms	3	To find the volume of a prism by counting unit cubes and by formula	<i>How can I find the volume of a figure for which I know the base?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath 8-4 p.645-646
27	Problem solving with figures	3, 5	To use problem solving strategies to arrive at the answer	<i>How do my normal problem solving strategies also work for geometry problems?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath p.647-649
28	Volume of pyramids	3, 5	<ul style="list-style-type: none"> • To find the volume of rectangular and triangular pyramids using the Area of the base x height rule – along with the 1/3 caveat • To find the height of a pyramid given the volume. 	<i>How is it the volume is always the area of the base x height in some way?</i>	<p><i>If you have the container shapes and some small grain material handy, you can take a day to do the Inquiry Lab on p. 651. Otherwise, pantomime their lab as part of your lesson to show 3 pyramids go into one prism with the same height and base measures.</i></p>	<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath 8-5 p.653-657
29	Volume of pyramids	3, 5	<ul style="list-style-type: none"> • To find the volume of rectangular and triangular pyramids using the Area of the base x height rule – along with the 1/3 caveat • To find the height of a pyramid given the volume. 	<i>How is it the volume is always the area of the base x height in some way?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath 8-5 p.659-660

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Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
30	Nets of 3-dimensional figures	3	<ul style="list-style-type: none"> To make a net from a prism To make a prism from its net. 	<i>How does a net help me see the measures of a 3-dimensional figure?</i>	<i>You need to plow through nets and have them come to an understanding of them. Standardized test makers love to throw nets at test takers. It's also helpful for surface area.</i>	<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath p.661-664
31	Surface area of rectangular and triangular prisms	3	To find the surface area of various prisms.	<i>How can a net help me see the areas I need to include?</i>	<i>Again, you can do rectangular on the first day and triangular on the second day, but the text has the practice intermingled.</i>	<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath 8-6 p.665-669
32	Surface area of rectangular and triangular prisms	3	To find the surface area of various prisms.	<i>How can a net help me see the areas I need to include?</i>		<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath 8-6 p.671-672
33	Surface area vis. volume	3	To determine that surface area and volume do not always have a positive correlation in figures.	<i>How do companies decide how to package a specific volume of a product using the least amount of material?</i>	<i>The question to the left is probably worth a conversation and having the students try a couple alternatives. Questions: why are almost all soup cans the same shape? Why are almost all cereal boxes the exact same shape?</i>	<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath p.673-676
34	Surface area of pyramids	3	To find the surface area of rectangular and triangular pyramids	<i>How is this just like finding the surface area of prisms?</i>	<i>Keep them to the same process – using a net to see all the sides. It's only the shape of the sides and the corresponding area formula that is different.</i>	<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath 8-7 p.677-682
35	Surface area of pyramids	3	To find the surface area of rectangular and triangular pyramids	<i>How is this just like finding the surface area of prisms?</i>		<i>Again, you can go square on Day 1 and triangular on Day 2, if you like.</i>	<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready
36	Volume and surface area of composite figures	3	To find the surface area and volume of each portion of a composite figure and add them together	<i>How is this more of the same now with two figures?</i>	<i>It's more of the same with two figures now.</i>	<ul style="list-style-type: none"> Lesson/Guided Practice Independent Practice Intervention/Enrichment i-Ready 	GlencoeMath p.685-688

Grade level: 7		Subject: Math			Unit #: 5				
Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources		
					Whole Group	Small Group / Stations			
37	Volume and surface area of composite figures	3	To find the surface area and volume of each portion of a composite figure and add them together	<i>How is this more of the same now with two figures?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath 8-8 p.689-694		
38	Volume and surface area of composite figures	3	To find the surface area and volume of each portion of a composite figure and add them together	<i>How is this more of the same now with two figures?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath 8-8 p.695-696		
39	Volume and surface area of figures	3	To determine mastery of skills and content	<i>Do I know enough to attack a problem by myself so I know what to do when?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • i-Ready 	GlencoeMath p.699-702		
40	Volume and surface area of figures	3	Assessment			<ul style="list-style-type: none"> • Review • Assessment 			
<u>Word Wall Candidates</u>									
Acute angle		Obtuse angle		Adjacent angles		Complementary angles		Supplementary angles	
Vertical angles		Right angle		Acute triangle		Equilateral triangle		Isosceles triangle	
Obtuse triangle		Right triangle		Straight angle		Scalene triangle		Base	
Diagonal		Edge		Face		Plane		Segment	
Vertex		Cone		Cylinder		Polyhedron		Prism	
Pyramid		Congruent		Coplanar		Scale		Scale Drawing	
Scale factor		Scale model		Skew line					

Grade level: 7

Subject: Math

Unit #: 5

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	

Authentic Application

Your goal: To find the composite figure that uses the least material while holding a specified volume of a product.

Your role: Member of a team.

Your audience: The members of the class.

The situation: Your team must select two figures to combine into a composite figure.
 Select one of the following volumes for your composite figure to hold: 10 in³, 20 in³, 25 in³, or 30 in³
 Find or calculate the figure that will hold the amount of material (volume) you've chosen your figure to hold while using the least amount of material (surface area) to make the composite figure.
 Construct the composite figure from construction paper. Use a different color for each part of your composite figure.

Your Product: Proof that the dimensions of your figure require the least amount of material for the volume it will hold.
 The neatly completed construction of your composite figure.

Success Criteria: Scoring rubric:

	4 points	3 points	2 points	1 point
Calculation	The composite figure uses the least required material	The composite figure uses the least required material but it doesn't fit together well	The composite figure doesn't use the least required material.	The composite figure doesn't use the least required material and It doesn't fit together well
Construction	The construction is done very neatly and the colors are well selected.	< ----->		The construction is done very poorly and it is monochrome.