



**Plainfield Public Schools  
Mathematics  
Unit Planning Organizer**

<b>Grade</b>	Grade 7
<b>Unit of Study</b>	<b>Unit 4 Geometry</b>
<b>Pacing</b>	7 instructional weeks

**Standards for Mathematical Practices**

- MP1. Make sense of problems and persevere in solving them.
- MP2. Reason abstractly and quantitatively.
- MP3. Construct viable arguments and critique the reasoning of others.
- MP4. Model with mathematics.
- MP5. Use appropriate tools strategically.
- MP6. Attend to precision.
- MP7. Look for and make use of structure.
- MP8. Look for and express regularity in repeated reasoning.

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Unit Standards

***7.G.2. Draw (with technology, with ruler and protractor, as well as freehand) 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.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.**

**7.RP.3. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.**

**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**

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**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?***

- b. **Solve word problems leading to equations 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.***

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“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
<b>FOCUS STANDARD:</b>		
<b>7.RP.3. Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i></b>		
Use Solve	Proportional Relationships Ratio Percent	2 3

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
<b>FOCUS STANDARD:</b>		
<b>7.EE.B.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>		
Use Construct	Equations Inequalities	2 3

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
<b>FOCUS STANDARD:</b>		
<b>7.EE.B.4. A Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic</b>		

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<p><b>solution, identifying the sequence of the operations used in each approach. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i></b></p>		
Solve	Variable	2
	Equations and inequalities	3

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
<p><b>FOCUS STANDARD:</b></p> <p><b>7.EE. 4b. Solve word problems leading to equations of the form <math>px + q &gt; r</math> or <math>px + q &lt; r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. <i>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.</i></b></p>		
Solve Graph	Equations inequalities	2 2 3

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
<p><b>ADDITIONAL STANDARD:</b></p> <p><b>7.G.2. Draw (with technology, with ruler and protractor, as well as freehand) 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.</b></p>		

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Draw	Geometric figures	2
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<b>“Unwrapped” Skills (students need to be able to do)</b>	<b>“Unwrapped” Concepts (students need to know)</b>	<b>DOK Levels</b>
<b>ADDITIONAL STANDARD:</b>		
<b>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.</b>		
Describe	Two – dimensional figures Three dimensional figures	1

<b>“Unwrapped” Skills (students need to be able to do)</b>	<b>“Unwrapped” Concepts (students need to know)</b>	<b>DOK Levels</b>
<b>ADDITIONAL STANDARD:</b>		
<b>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.</b>		
Know	Circumference	1
Solve	area	2

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“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
<b>ADDITIONAL STANDARD:</b> 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.		
Use Solve	Simple equations	2 2

“Unwrapped” Skills (students need to be able to do)	“Unwrapped” Concepts (students need to know)	DOK Levels
<b>ADDITIONAL STANDARD:</b> 7.G.B.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.		
Solve	Area, Volume, surface area	2

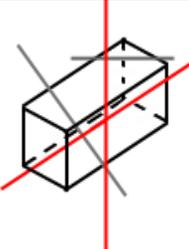
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## II. Mathematical Standards and Practice .... Explanation and Examples

<b>Geometry (G)</b>		
<b>Draw, construct, and describe geometrical figures and describe the relationships between them.</b>		
<u>Standards</u>	<u>Mathematical Practices</u>	<u>Explanations and Examples</u>
<p><i>Students are expected to:</i></p> <p><b>7.G.2.</b> Draw (with technology, with ruler and protractor, as well as freehand) 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.</p>	<p><i>7.MP.4. Model with mathematics.</i></p> <p><i>7.MP.5. Use appropriate tools strategically.</i></p> <p><i>7.MP.6. Attend to precision.</i></p> <p><i>7.MP.7. Look for and make use of structure.</i></p> <p><i>7.MP.8. Look for and express regularity in repeated reasoning.</i></p>	<p>Conditions may involve points, line segments, angles, parallelism, congruence, angles, and perpendicularity.</p> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>• Is it possible to draw a triangle with a <math>90^\circ</math> angle and one leg that is 4 inches long and one leg that is 3 inches long? If so, draw one. Is there more than one such triangle?</li> <li>• Draw a triangle with angles that are 60 degrees. Is this a unique triangle? Why or why not?</li> <li>• Draw an isosceles triangle with only one 80 degree angle. Is this the only possibility or can you draw another triangle that will also meet these conditions?</li> </ul>  <ul style="list-style-type: none"> <li>• Can you draw a triangle with sides that are 13 cm, 5 cm and 6cm?</li> <li>• Draw a quadrilateral with one set of parallel sides and no right angles.</li> </ul>
<p>7.G.A.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.</p>	<p><i>7.MP.2. Reason abstractly and quantitatively.</i></p> <p><i>7.MP.4. Model with mathematics.</i></p> <p><i>7.MP.5. Use appropriate tools</i></p>	<p><b>Example:</b></p> <ul style="list-style-type: none"> <li>• Using a clay model of a rectangular prism, describe the shapes that are created when planar cuts are made diagonally, perpendicularly, and parallel to the base.</li> </ul>

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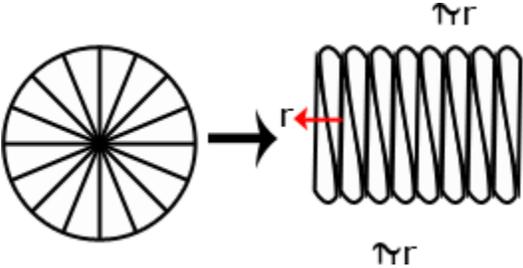
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	<p><i>strategically.</i></p> <p><i>7.MP.7. Look for and make use of structure.</i></p>	
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<b>Geometry (G)</b> <b>Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</b>		
<u>Standards</u> <i>Students are expected to:</i>	<u>Mathematical Practices</u>	<u>Explanations and Examples</u>
<p><b>7.G.B.4.</b> Know the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle.</p>	<p><i>7.MP.1.</i> Make sense of problems and persevere in solving them.</p> <p><i>7.MP.2.</i> Reason abstractly and quantitatively.</p> <p><i>7.MP.3.</i> Construct viable arguments and critique the reasoning of others.</p> <p><i>7.MP.4.</i> Model with mathematics.</p> <p><i>7.MP.5.</i> Use appropriate tools strategically.</p> <p><i>7.MP.6.</i> Attend to precision.</p> <p><i>7.MP.7.</i> Look for and make use</p>	<p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>• The seventh grade class is building a mini golf game for the school carnival. The end of the putting green will be a circle. If the circle is 10 feet in diameter, how many square feet of grass carpet will they need to buy to cover the circle? How might you communicate this information to the salesperson to make sure you receive a piece of carpet that is the correct size?</li> <li>• Students measure the circumference and diameter of several circular objects in the room (clock, trash can, door knob, wheel, etc.). Students organize their information and discover the relationship between circumference and diameter by noticing the pattern in the ratio of the measures. Students write an expression that could be used to find the circumference of a circle with any diameter and check their expression on other circles.</li> <li>• Students will use a circle as a model to make several equal parts as you would in a pie model. The greater number the cuts, the better. The pie pieces are laid out to form a shape similar to a parallelogram. Students will then write an expression for the area of the</li> </ul>

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	<p>of structure.</p> <p>7.MP.8. Look for and express regularity in repeated reasoning.</p>	<p>parallelogram related to the radius (note: the length of the base of the parallelogram is half the circumference, or <math>\pi r</math>, and the height is <math>r</math>, resulting in an area of <math>\pi r^2</math>. Extension: If students are given the circumference of a circle, could they write a formula to determine the circle's area or, given the area of a circle, could they write the formula for the circumference?</p> 
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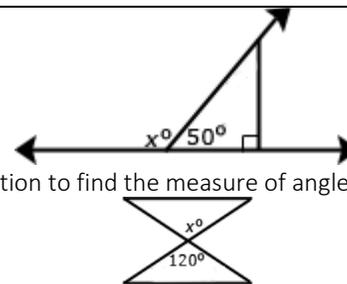
<b>Geometry (G)</b> <b>Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</b>		
<u>Standards</u> <i>Students are expected to:</i>	<u>Mathematical Practices</u>	<u>Explanations and Examples</u>
<p><b>7.G.B.5.</b> Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</p>	<p>7.MP.3. Construct viable arguments and critique the reasoning of others.</p> <p>7.MP.4. Model with mathematics.</p> <p>7.MP.5. Use appropriate tools strategically.</p>	<p>Angle relationships that can be explored include but are not limited to:</p> <ul style="list-style-type: none"> <li>• Same-side (consecutive) interior and same-side (consecutive) exterior angles are supplementary.</li> </ul> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>• Write and solve an equation to find the measure of angle <math>x</math>.</li> </ul>

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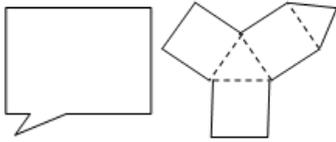
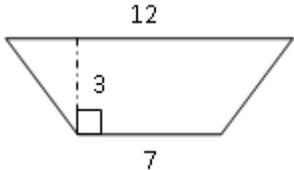
7.MP.6. Attend to precision.  
7.MP.7. Look for and make use of structure.

- Write and solve an equation to find the measure of angle  $x$ .



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<p><b>7.G.B.6.</b> 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.</p>	<p><i>7.MP.1.</i> Make sense of problems and persevere in solving them.</p> <p><i>7.MP.2.</i> Reason abstractly and quantitatively.</p> <p><i>7.MP.3.</i> Construct viable arguments and critique the reasoning of others.</p> <p><i>7.MP.4.</i> Model with mathematics.</p> <p><i>7.MP.5.</i> Use appropriate tools strategically.</p> <p><i>7.MP.6.</i> Attend to precision.</p> <p><i>7.MP.7.</i> Look for and make use of structure.</p> <p><i>7.MP.8.</i> Look for and express regularity in repeated reasoning.</p>	<p>Students understanding of volume can be supported by focusing on the area of base times the height to calculate volume. Students understanding of surface area can be supported by focusing on the sum of the area of the faces. Nets can be used to evaluate surface area calculations.</p> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>Choose one of the figures shown below and write a step by step procedure for determining the area. Find another person that chose the same figure as you did. How are your procedures the same and different? Do they yield the same result?</li> </ul> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> <li>A cereal box is a rectangular prism. What is the volume of the cereal box? What is the surface area of the cereal box? (Hint: Create a net of the cereal box and use the net to calculate the surface area.) Make a poster explaining your work to share with the class.</li> </ul> <p><i>Continued on next page</i></p> <ul style="list-style-type: none"> <li>Find the area of a triangle with a base length of three units and a height of four units.</li> <li>Find the area of the trapezoid shown below using the formulas for rectangles and triangles.</li> </ul> <div style="text-align: center;">  </div>
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<b>Expressions and Equations (EE)</b>		
<b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b>		
<u>Standards</u> <i>Students are expected to:</i>	<u>Mathematical Practices</u>	<u>Explanations and Examples</u>
<p><b>7.EE.B.4.</b> 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.</p> <p>a. Solve word problems leading to equations of the form <math>px+q=r</math> and <math>p(x+q)=r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> 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. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What</i></p>	<p><i>7.MP.1.</i> Make sense of problems and persevere in solving them.</p> <p><i>7.MP.2.</i> Reason abstractly and quantitatively.</p> <p><i>7.MP.3.</i> Construct viable arguments and critique the reasoning of others.</p> <p><i>7.MP.4.</i> Model with mathematics.</p> <p><i>7.MP.5.</i> Use appropriate tools strategically.</p> <p><i>7.MP.6.</i> Attend to precision.</p> <p><i>7.MP.7.</i> Look for and make use of structure.</p> <p><i>7.MP.8.</i> Look for and express regularity in repeated reasoning.</p>	<p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>Amie had \$26 dollars to spend on school supplies. After buying 10 pens, she had \$14.30 left. How much did each pen cost?</li> <li>The sum of three consecutive even numbers is 48. What is the smallest of these numbers?</li> </ul> $\frac{5}{4}n + 5 = 20$ <p>Solve:</p> <ul style="list-style-type: none"> <li>Florencia has at most \$60 to spend on clothes. She wants to buy a pair of jeans for \$22 dollars and spend the rest on t-shirts. Each t-shirt costs \$8. Write an inequality for the number of t-shirts she can purchase.</li> <li>Steven has \$25 dollars. He spent \$10.81, including tax, to buy a new DVD. He needs to set aside \$10.00 to pay for his lunch next week. If peanuts cost \$0.38 per package including tax, what is the maximum number of packages that Steven can buy?</li> </ul> <p>Write an equation or inequality to model the situation. Explain how you determined whether to write an equation or inequality and the properties of the real number system that you used to find a solution.</p>

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<p><i>is its width?</i></p> <p><i>Continued on next page</i></p>		<ul style="list-style-type: none"> <li>• Solve <math>\frac{1}{2}x + 3 &gt; 2</math> and graph your solution on a number line.</li> </ul>
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<b>Expressions and Equations (EE)</b> <b>Solve real-life and mathematical problems using numerical and algebraic expressions and equations. <i>continued</i></b>		
<b><u>Standards</u></b> <i>Students are expected to:</i>	<b><u>Mathematical Practices</u></b>	<b><u>Explanations and Examples</u></b>
<p><b>7.EE.B.4. <i>continued</i></b></p> <p>b. Solve word problems leading to inequalities of the form <math>px+q&gt;r</math> or <math>px+q &lt; r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. <i>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.</i></p>		

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**7.RP.A.3.** Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*

*7.MP.1.* Make sense of problems and persevere in solving them.

*7.MP.2.* Reason abstractly and quantitatively.

*7.MP.3.* Construct viable arguments and critique the reasoning of others.

*7.MP.4.* Model with mathematics.

*7.MP.5.* Use appropriate tools strategically.

*7.MP.6.* Attend to precision.

*7.MP.7.* Look for and make use of structure.

*7.MP.8.* Look for and express regularity in repeated reasoning.

Students should be able to explain or show their work using a representation (numbers, words, pictures, physical objects, or equations) and verify that their answer is reasonable. Models help students to identify the parts of the problem and how the values are related. For percent increase and decrease, students identify the starting value, determine the difference, and compare the difference in the two values to the starting value.

### Examples:

- Gas prices are projected to increase 124% by April 2015. A gallon of gas currently costs \$4.17. What is the projected cost of a gallon of gas for April 2015?

A student might say: "The original cost of a gallon of gas is \$4.17. An increase of 100% means that the cost will double. I will also need to add another 24% to figure out the final projected cost of a gallon of gas. Since 25% of \$4.17 is about \$1.04, the projected cost of a gallon of gas should be around \$9.40."

$$\$4.17 + 4.17 + (0.24 \cdot 4.17) = 2.24 \times 4.17$$

100%	100%	24%
\$4.17	\$4.17	?

- A sweater is marked down 33%. Its original price was \$37.50. What is the price of the sweater before sales tax?

37.50	
33% of 37.50	67% of 37.50

The discount is 33% times 37.50. The sale price of the sweater is the original price minus the discount or 67% of the original price of the sweater, or Sale Price = 0.67 x Original Price.

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<p><b>7.RP.A.3.</b> <i>continued</i></p>		<ul style="list-style-type: none"> <li>• A shirt is on sale for 40% off. The sale price is \$12. What was the original price? What was the amount of the discount?</li> </ul> <table border="1" data-bbox="1035 342 1625 459"> <tr> <td data-bbox="1035 342 1293 415">Discount</td> <td data-bbox="1293 342 1625 415">Sale Price - \$12</td> </tr> <tr> <td colspan="2" data-bbox="1035 415 1625 459">Original Price (p)</td> </tr> </table> $0.60p = 12$ <ul style="list-style-type: none"> <li>• At a certain store, 48 television sets were sold in April. The manager at the store wants to encourage the sales team to sell more TVs and is going to give all the sales team members a bonus if the number of TVs sold increases by 30% in May. How many TVs must the sales team sell in May to receive the bonus? Justify your solution.</li> <li>• A salesperson set a goal to earn \$2,000 in May. He receives a base salary of \$500 as well as a 10% commission for all sales. How much merchandise will he have to sell to meet his goal?</li> <li>• After eating at a restaurant, your bill before tax is \$52.60. The sales tax rate is 8%. You decide to leave a 20% tip for the waiter based on the pre-tax amount. How much is the tip you leave for the waiter? How much will the total bill be, including tax and tip? Express your solution as a multiple of the bill. The amount paid = <math>0.20 \times \\$52.50 + 0.08 \times \\$52.50 = 0.28 \times \\$52.50</math>.</li> </ul>	Discount	Sale Price - \$12	Original Price (p)	
Discount	Sale Price - \$12					
Original Price (p)						

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**III. Essential Questions .....Corresponding Big Ideas**

Essential Questions	Corresponding Big Ideas
<p>How do you calculate the surface area and volume of a prism?</p> <p>As the dimension of a prism by a certain scale factor; how do the volume and surface area change?</p> <p>How for you find the volume of any prism?</p> <p>What surface shapes and three dimensional figures can be created by slicing a prism in any direction?</p> <p>How is the circumference of circle used to derive the area of a circle?</p>	<p>Decomposing and rearranging provided a geometric way of both seeing that a measurement formula is the right one and seeing why it is the right one.</p> <p>In addition to decomposing and rearranging, shearing provides another geometric way of both seeing that a measurement formula is the right one and seeing why it is the right one.</p> <p>Geometric images provide the content in relation to which properties can be noticed, definitions can be made, and invariances can be discerned.</p> <p>Symmetry provides a powerful way of working geometrically.</p> <p>Geometric awareness develops through practice in visualizing, diagramming and constructing.</p> <p>Tools provide new sources of imagery as well as specific ways of thinking about geometric objects and processes,</p> <p>Geometric thinking turn tools into objects, and in geometry the process of turning an action undertaken with a tool into am object happens over and over again.</p>

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	<p>Naming is just not about nomenclature: it draws attention to properties and objects of geometric interest, Definition can both generate and reflect structure; definitions are often dependent on a specific classification.</p> <p>Conjectures can emerge out of a problem –posing process that generates claims that need to be justified.</p> <p><i>Source:</i> <i>Lloyd, G., Herbel-Eisenmann, B., &amp; Star, J.R. (2011). Developing essential understanding of Geometry in Grades 6-8. Reston, VA: The National Council of Teachers of Mathematics, Inc</i></p>
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### IV. Student Learning Goals

Student Learning Goals	Concepts/Skills	<u><i>Instructional Clarification as per PARCC Mathematics Test Specification</i></u>	Mathematical Practices
<p>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.B.4</p>	<p><b>Concept(s):</b></p> <ul style="list-style-type: none"> <li>• Circumference</li> </ul> <p><b>Students are able to:</b></p> <ul style="list-style-type: none"> <li>• solve problems by finding the area and circumference of circles.</li> <li>• show that the area of a circle can be derived from the circumference.</li> </ul>	<ul style="list-style-type: none"> <li>• Tasks may or may not have context.</li> <li>• Tasks may require answers to be written in terms of <math>\pi</math></li> <li>• Tasks require students to identify or produce a logical conclusion about the relationship between the circumference and the area of a circle</li> </ul>	<p>MP.1 MP.2 MP.3 MP.4 MP.5 MP.6 MP.7 MP.8</p>
<p>Write and solve <i>simple</i> multi-step algebraic equations involving supplementary, complementary, vertical, and adjacent angles. 7.G.B.5, 7.EE.B.4, 7.EE.B.4a</p>	<p>Concept(s): No new concept(s) introduced</p> <p><b>Students are able to:</b></p> <ul style="list-style-type: none"> <li>• use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations.</li> <li>• solve mathematical problems by writing and solving simple algebraic equations based on the relationships</li> </ul>	<ul style="list-style-type: none"> <li>• Tasks may or may not have context.</li> <li>• Tasks involving writing or solving an equation should not go beyond the equation types described in 7.EE.4a. [<math>px + q = r</math> and <math>p(x + q) = r</math> where <math>p</math>, <math>q</math>, and <math>r</math> are specific rational numbers.]</li> </ul>	<p>MP.3. MP.4 MP.5 MP.6. MP.7</p>

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	<p>between and properties of angles (supplementary, complementary, vertical, and adjacent.</p> <ul style="list-style-type: none"> <li>• write an equation of the form <math>px + q = r</math> or <math>p(x + q) = r</math> in order to solve a word problem.</li> <li>• fluently solve equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math></li> </ul>		
<p>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.B.6.</p>	<p><b>Concept(s):</b> No new concept(s) introduced  <b>Students are able to:</b></p> <ul style="list-style-type: none"> <li>• solve real-world and mathematical problems involving area of two dimensional objects composed of triangles, quadrilaterals, and polygons.</li> <li>• solve real-world and mathematical problems involving volume of three dimensional objects composed of cubes and right prisms.</li> <li>• solve real-world and mathematical problems involving surface area of three-dimensional objects composed of cubes and right prisms</li> </ul>	<ul style="list-style-type: none"> <li>• Tasks may or may not have context.</li> </ul>	<p>MP.1  MP.2.  MP.3.  MP.4  MP.5.  MP.6.  MP.7.</p>
<p>Use freehand, mechanical (i.e.</p>	<p><b>Concept(s):</b></p>	<ul style="list-style-type: none"> <li>• Tasks do not have a</li> </ul>	<p>MP.3.</p>

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<p>ruler, protractor) and technological tools to draw geometric shapes with given conditions (e.g. scale factor), focusing on constructing triangles. 7.G.B.2</p>	<ul style="list-style-type: none"> <li>• Conditions for unique triangles, more than one triangle, and no triangle.</li> </ul> <p><b>Students are able to:</b></p> <ul style="list-style-type: none"> <li>• draw geometric shapes with given conditions, including constructing triangles from three measures of angles or sides. recognize conditions determining a unique triangle, more than one triangle, or no triangle</li> </ul>	<p>context.</p> <ul style="list-style-type: none"> <li>• Most of tasks should focus on the drawing component of this evidence statement.</li> </ul>	<p>MP.5 MP.6 MP.7</p>
<p>Describe all of the 2-dimensional figures that result when a 3-dimensional figures are sliced from multiple angles. 7.G.A.3</p>	<p><b>Concept(s):</b></p> <ul style="list-style-type: none"> <li>• Cross-sections of three-dimensional objects</li> </ul> <p><b>Students are able to:</b></p> <ul style="list-style-type: none"> <li>• analyze three dimensional shapes (right rectangular pyramids and prisms) by examining and describing all of the 2-dimensional figures that result from slicing it at various angles.</li> </ul>	<p>Tasks have “thin context” or no context.</p>	<p>MP.5 MP.6 MP.7</p>
<p>Solve multi-step ratio and percent problems using proportional relationships (<i>simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and</i></p>	<p><b>Concept(s):</b></p> <ul style="list-style-type: none"> <li>• Recognize percent as a ratio indicating the quantity <i>per one hundred</i>.</li> </ul> <p><b>Students are able to:</b></p> <ul style="list-style-type: none"> <li>• use proportions to solve multistep percent problems</li> </ul>	<ul style="list-style-type: none"> <li>• Solve multi-step contextual problems with degree of difficulty appropriate to grade 7, requiring application of knowledge and skills articulated in 6.RP.A, 6.EE.C, 6.G.</li> </ul>	<p>MP.1 MP.2 MP.4. MP.5 MP.6 MP.7.</p>

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<p><i>decrease, percent error</i>). 7.RP.A.3</p>	<p>including simple interest, tax, markups, discounts, gratuities, commissions, fees, percent increase, percent decrease, percent error.</p> <ul style="list-style-type: none"><li>• use proportions to solve multistep ratio problems.</li></ul>		
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### IV. Unit Vocabulary

Unit Vocabulary	
Cone	Line segment
Cylinder	Perpendicular line
Rectangular Prism	Parallel line
Right Prism	Right angle
Prism	Vertical Angle
Pyramid	Adjacent angle
Sphere	Supplementary angles
Triangular	Complementary angles
Circumference	Exterior angles
Diameter	Interiors angles
Radius	Polygons
Volume	Regular polygon
Area	Irregular polygon
Surface area	
Net	

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**V. Differentiation/ Modifications Teaching Strategies**

Research Based Effective Teaching Strategies	Modifications (How do I differentiate instruction?)	Special Education	Strategies for English Language Learners
<p>Task /Activities that solidifies mathematical concepts Use questioning techniques to facilitate learning</p> <p>Reinforcing Effort, Providing Recognition</p> <p>Practice, reinforce and connect to other ideas within mathematics</p> <p>Promotes linguistic and nonlinguistic representations</p> <p>Cooperative Learning Setting Objectives, Providing Feedback</p> <p>Varied opportunities for students to communicate mathematically</p> <p>Use technological and /or physical tools</p>	<p><b>Modifications</b> Before or after school tutorial program Leveled rubrics Increased intervention Small groups Change in pace Calculators Extended time Alternative assessments Tiered activities/products Color coded notes Use of movements Use any form of technology</p> <p><b>Extension</b></p> <p><u><i>See Connected Math Program Classroom Differentiating for Gifted Students</i></u></p> <p>Research how hat sizes were determined! Or, check out the web site of a company that makes and sells hats, and you might</p>	<p>Change in pace</p> <p>Calculators</p> <p>Alternative assessments</p> <p>Accommodations as per IEP</p> <p>Modifications as per IEP Use graphic organizer to clarify mathematical functions for students with processing and organizing difficulties’.</p> <p>Constant review of math concepts to strengthen understanding of prior concepts for difficulties recalling facts.</p> <p>Use self-regulations strategies for student to monitor and assess their thinking and performance for difficulty attending to task</p> <p>Cooperative learning (small</p>	<p><u><i>Whiteboards</i></u> <u><i>Small Group / Triads</i></u> <u><i>Word Walls</i></u> <u><i>Partially Completed Solution</i></u> <u><i>Gestures</i></u> <u><i>Native Language Supports</i></u> <u><i>Pictures / Photos</i></u> <u><i>Partner Work</i></u> <u><i>Work Banks</i></u> <u><i>Teacher Modeling</i></u> <u><i>Math Journals</i></u></p> <p><u><i>See Connected Math Program Classroom Differentiating for English Language Learners</i></u></p>

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<p><b><u>21st Century Learning Skills :</u></b></p> <p>Teamwork and Collaboration</p> <p>Initiative and Leadership</p> <p>Curiosity and Imagination</p> <p>Innovation and Creativity</p> <p>Critical thinking and Problem Solving</p> <p>Flexibility and Adaptability</p> <p>Effective Oral and Written Communication</p> <p>Accessing and Analyzing Information</p>	<p>find a table like the one below. What is the relationship between men's head measurement (in inches) and American hat sizes? Have students measure the circumference of their head, and divide it by <math>\pi</math> - the result is their hat size</p>	<p>group, teaming, peer assisted tutoring) to foster communication and strengthen confidence.</p> <p>Use technology and/or hands on devices to: clarify abstract concepts and process for:</p> <ol style="list-style-type: none"> <li>1. Difficulty interpreting pictures and diagram.</li> <li>2. difficulties with oral communications</li> <li>3. Difficulty correctly identifying symbols of numeral</li> <li>4. Difficulty maintaining attentions</li> </ol> <p>Simplify and reduces strategies / Goal structure to enhance motivation, foster independence and self-direction for:</p> <ol style="list-style-type: none"> <li>1. Difficulty attending to task</li> <li>2. Difficulty with following a sequence of steps to solution.</li> </ol>	
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		<p>3. Difficulty processing and organizing</p> <p>Scaffolding math idea/concepts guided practice and questioning strategies' to clarify and enhance understanding of math big ideas for :</p> <ol style="list-style-type: none"> <li>1. Difficulty with process and organization</li> <li>2. difficulty with oral and written communication</li> </ol> <p>Models strategies' and think out aloud strategies to specify step by step process for</p> <ol style="list-style-type: none"> <li>1. Difficulties processing and organization</li> <li>2. Difficulty attending to tasks.</li> </ol> <p>Use bold numbers and/or words to draw students' attention to important information.</p> <p><u><i>See Connected Math Program Classroom Differentiating for Special Needs</i></u></p>	
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## VI. Instructional Resources

Instructional Resources and Materials		
Formative Assessment	Print	
Short constructed responses	<b>Connected Math Program Grade 7 Unit: Shrinking and Stretching:</b> Investigation 2-4	
Extended responses	<b>Connected Math Program Grade 7 Unit: Filling and Wrapping;</b> Investigation 3-4	
Checks for Understanding	<b>Connected Math Program Grade 7 Unit: Shape and Designs:</b> Investigation 2-3	
Exit tickets	<i>Scope and Sequence Connected Math Program 3</i>	
Teacher observation	<b>Additional Print and Digital Resources</b>	
Projects	Resources for teachers	Resources for Students
Timed Practice Test – Multiple	<u><i>Annenberg Learning : Insight into Algebra 1</i></u>	<u><i>My Math Universe.com</i></u>
Choice & Open-Ended Questions	<u><i>National Council of Teachers of Mathematics</i></u>	<u><i>Math is Fun website</i></u>
<b>Performance Tasks:</b>	<u><i>Mathematics Assessment Projects</i></u>	<u><i>Khan Academy</i></u>
<i>7.RP.A.3, 7.EE.B.3,4 Gotham City Taxis</i>	<u><i>Achieve the Core</i></u>	<u><i>Figure This.org website</i></u>
<i>7.G.B.6, 7.RP.A.3 Sand under the Swing Set</i>	<u><i>Illustrative Mathematics</i></u>	<u><i>Virtual Nerd website</i></u>
<b>Additional Performance Tasks</b>	<u><i>Mathematics Assessment Projects</i></u>	<u><i>Math Snacks websites</i></u>
<i>7.G.B.4 Wedges of a Circle</i>	<u><i>Get the Math</i></u>	<u><i>Internet 4 Classroom website</i></u>
<i>7.G.B.4 Eight Circles</i>	<u><i>Webmath.com</i></u>	<u><i>A Maths Dictionary for kids</i></u>
<i>7.G.A.2 A task related to 7.G.A.2</i>	<u><i>sosmath.com</i></u>	
<i>7.G.A.3 Cube Ninjas!</i>	<u><i>Mathplanet.com</i></u>	
<i>7.RP, 7.EE, 7.NS Drill Rig</i>	<u><i>Interactive Mathematics.com</i></u>	
<b>Project (optional)</b>	<u><i>Inside Mathematics.org</i></u>	
<i>Problem Based Learning Project :</i>	<u><i>Asia Pacific Economic Cooperation : :Lesson Study Videos</i></u>	
	<u><i>Genderchip.org</i></u>	
	<u><i>Interactive Geometry</i></u>	
	<u><i>Mathematical Association of America</i></u>	

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<u><i>Teach 21 :Classroom Makeover</i></u>	<u><i>learner.org</i></u> <u><i>Connected Math Project ( Michigan State University)</i></u> <u><i>My Pearson Training : Connected Math Program</i></u>	
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