

## Content Research Synthesis Project (CRSP) Elementary Grades Education

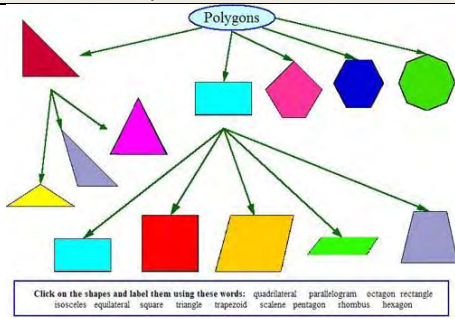
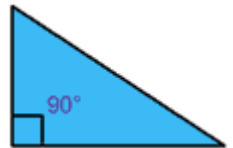
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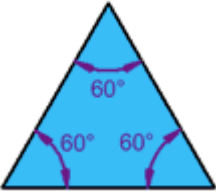
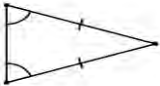
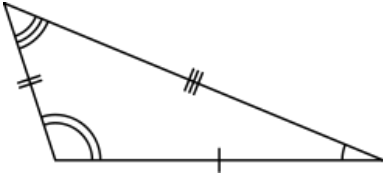
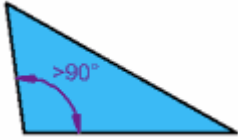
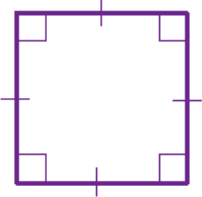
Course: EDEL 419

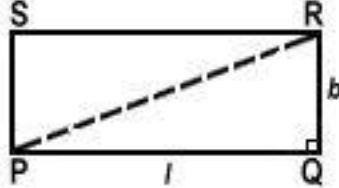
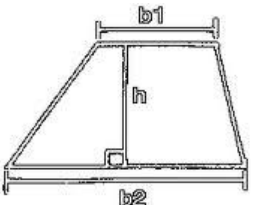
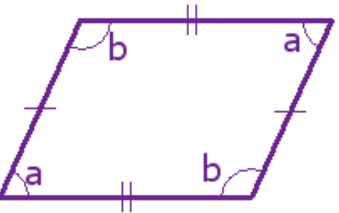
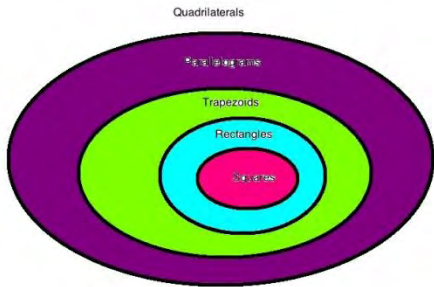
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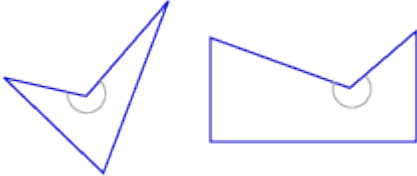

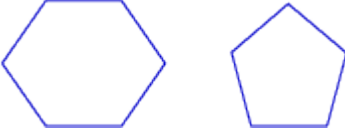

Topic: Geometry/Classification of Polygons

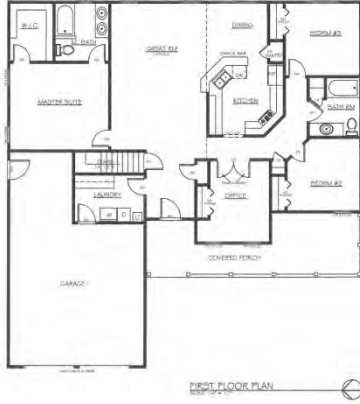

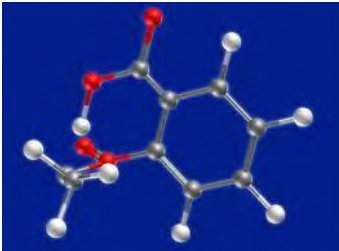
Engage	
What I Think I Know	What I Wonder
<ul style="list-style-type: none"> <li>-I know that there are many different classifications of polygons.</li> <li>-I know that as a student today, I did not remember all of the triangle classifications I learned in elementary school.</li> <li>-Angle measurement, number of sides, and side length are the three identifiers that define a shape.</li> <li>-Polygons are introduced at the very beginning of a child's education and are studied and practiced throughout his or her entire schooling.</li> </ul>	<ul style="list-style-type: none"> <li>-I wonder how I can teach polygons in a way that students can easily remember all of them long term.</li> <li>-I wonder the best way to introduce triangles/polygons, along with their pre-requisites and post-requisites at each skill level.</li> </ul>

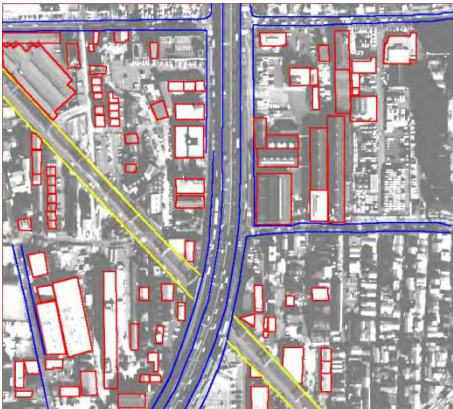
Research: A Thorough Literature Review			
Domains	Claims	Evidence	Examples & Illustrations
Big Idea	<p>Polygons are closed plane figures in which each are bound by at least three sides and have at least three angles. Their identifications vary depending on their properties and can be broadly grouped into three simple categories; triangles, quadrilaterals, and other classifications of other polygons.</p>	<p>Polygon. (2011). <i>Encyclopedia britannica company</i>. Retrieved June 18, 2011, from <a href="http://www.merriam-webster.com/dictionary/polygon">http://www.merriam-webster.com/dictionary/polygon</a></p>	
Key Conceptual Ideas and Related Details	<p><b><u>Classification of Polygons</u></b></p> <p><b><u>Triangles</u></b></p> <p>&gt; <b>Right Triangle</b></p> <p>- a three sided figure with one 90 degree angle.</p>	<p><i>Math is fun; definition of right angled triangle.</i> (2009, March 19). Retrieved from <a href="http://www.mathsisfun.com/definitions/right-angled-triangle.html">http://www.mathsisfun.com/definitions/right-angled-triangle.html</a></p>	

	<p>&gt; <b>Equilateral Triangle</b> - a three sided figure in which all of the angles are 60 degrees and the side and angle measurements are all equal to each other.</p> <p>&gt; <b>Isosceles Triangle</b> - a three sided figure in which two sides are the same and two angles are the same.</p> <p>&gt; <b>Scalene Triangle</b> - a three sided figure in which all three angles and side lengths are different.</p> <p>&gt; <b>Obtuse Triangle</b> - a three sided figure in which there is one obtuse angle (an angle measuring greater than 90 degrees).</p> <p style="text-align: center;"><b><u>Quadrilaterals</u></b></p> <p>Quadrilaterals:</p> <ul style="list-style-type: none"> <li>• Types of Quadrilaterals: <ul style="list-style-type: none"> <li>○ Squares</li> <li>○ Rectangles</li> <li>○ Trapezoids</li> <li>○ Parallelograms</li> </ul> </li> <li>• Rules for Squares: <ul style="list-style-type: none"> <li>○ There are 4 sides</li> <li>○ All the sides are of equal lengths</li> <li>○ Both sets of sides are parallel</li> <li>○ To find the area, you multiply height</li> </ul> </li> </ul>	<p><i>Math open reference; equilateral triangle.</i> (2009, January 01). Retrieved from <a href="http://www.mathopenref.com/equilateral.html">http://www.mathopenref.com/equilateral.html</a></p> <p>Loy, J. (1999). <i>Isosceles triangles</i>. Retrieved from <a href="http://www.jimloy.com/geometry/iso.htm">http://www.jimloy.com/geometry/iso.htm</a></p> <p><i>Scalene triangle.</i> (2011, June 12). Retrieved from <a href="http://www.mathgoodies.com/glossary/term.asp?term=scalene%20triangle">http://www.mathgoodies.com/glossary/term.asp?term=scalene%20triangle</a></p> <p><i>Math warehouse; types of triangles.</i> (2011). Retrieved from <a href="http://www.mathwarehouse.com/geometry/triangles/train-gletypes.php">http://www.mathwarehouse.com/geometry/triangles/train-gletypes.php</a></p> <p>Pierce, Rod. (2011). "Polygons". Math Is Fun. Retrieved 16 June 2011 from <a href="http://www.mathsisfun.com/geometry/polygons.html">http://www.mathsisfun.com/geometry/polygons.html</a></p>	    
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	<p>by length</p> <ul style="list-style-type: none"> <li>Rules for Rectangles <ul style="list-style-type: none"> <li>4 sides</li> <li>There are 2 sets of parallel sides</li> <li>There are 2 sets of sides with equal length, but not all 4 sides have to be the same length</li> <li>To find area, you multiply length by width</li> </ul> </li> <li>Rules for Trapezoids: <ul style="list-style-type: none"> <li>There must be at least one pair of parallel sides</li> <li>To find the area, you must use a formula. That formula is <math>A = \frac{1}{2} \times (b_1 + b_2) \times h</math> where <math>b_1</math> is base one, <math>b_2</math> is base two, and <math>h</math> is height.</li> </ul> </li> <li>Rules for Parallelograms <ul style="list-style-type: none"> <li>There are 2 sets of parallel lines and opposite sides are equal in length. Also, the opposite angles in the figure are the same.</li> </ul> </li> </ul> <p>All squares are rectangles, and all rectangles are trapezoids, and all trapezoids are quadrilaterals.</p>	<p>Anneberg Foundation. (2011). "Hidden Polygons". Retrieved 16 Jun 2011 from <a href="http://www.learner.org/courses/learningmath/">www.learner.org/courses/learningmath/</a></p> <p>Anneberg Foundation. (2011). "Hidden Polygons". Retrieved 16 Jun 2011 from <a href="http://www.learner.org/courses/learningmath/">www.learner.org/courses/learningmath/</a></p> <p>Van de Walle, J. A., Karp, K. S., &amp; Bay-Williams, J. M. (2010). <i>Elementary and middle school mathematics</i>. Boston, MA: Allyn &amp; Bacon.</p> <p>Anneberg Foundation. (2011). "Hidden Polygons". Retrieved 16 June 2011 from <a href="http://www.learner.org/courses/learningmath/">www.learner.org/courses/learningmath/</a></p>	   
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	<p><b><u>Other names and classification of polygons</u></b></p> <p>&gt;polygons</p> <p>&gt;<b>Concave</b></p> <ul style="list-style-type: none"> <li>-these shapes have an angle “caving” inside the shape</li> <li>-if any of the angles is larger than 180 degrees, it is considered to be concave</li> </ul> <p>&gt;<b>Convex</b></p> <ul style="list-style-type: none"> <li>-unlike concave polygons, convex polygons have no angles caving in</li> <li>-Also, their angles are no larger than 180 degrees</li> </ul> <p>&gt;<b>Regular</b></p> <ul style="list-style-type: none"> <li>-regular polygons have the same size in length size and angle size</li> </ul> <p>&gt;<b>Irregular</b></p> <ul style="list-style-type: none"> <li>-to be an irregular polygon the shape does not have the same length in sides and angles.</li> <li>-Rectangles are irregular because their all sides are not the same</li> </ul>	<p>Pierce, Rod. (2011). “Polygons”. Math Is Fun. Retrieved 16 June 2011 from <a href="http://www.mathsisfun.com/geometry/polygons.html">http://www.mathsisfun.com/geometry/polygons.html</a></p> <p>Van de Walle, J. A., Karp, K. S., &amp; Bay-Williams, J. M. (2010). <i>Elementary and middle school mathematics</i>. Boston, MA: Allyn &amp; Bacon.</p> <p>Pierce, Rod. (2011). “Polygons”. Math Is Fun. Retrieved 16 June 2011 from <a href="http://www.Mathsisfun.com/geometry/polygons.html">http://www.Mathsisfun.com/geometry/polygons.html</a></p> <p>Anneberg Foundation. (2011). “Hidden Polygons”. Retrieved 16 Jun 2011 from <a href="http://www.learner.org/courses/learningmath/">www.learner.org/courses/learningmath/</a></p>	   
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<p>Real World Connections</p>	<p>Through understanding polygons and the ability to identify and describe each in real world situations, a student is able to better master and have skills in the following, yet not limited to, fields:</p> <ul style="list-style-type: none"> <li>-Sign identification</li> <li>-Measurement</li> <li>-Construction</li> <li>-Art</li> <li>-Cooking/ Cake Baking</li> <li>-Interior Designers</li> <li>-Architecture</li> <li>- Driving</li> <li>- Fashion Designers</li> <li>-etc.</li> </ul> <p>These are just some of the many ways polygon knowledge is used throughout life on a daily basis.</p>	<p>Weiss, T. (2010). <i>Tool factory curriculum; locating polygons in the environment</i>. Retrieved from <a href="http://www.toolfactory.com/cgi-bin/gencur.py?page=plan&amp;pid=153&amp;subject=5">http://www.toolfactory.com/cgi-bin/gencur.py?page=plan&amp;pid=153&amp;subject=5</a></p>	 
<p>Curricular Connections</p>	<p>Students often study and use their previous knowledge of polygons through all areas of the curriculum in school.</p> <p>-In science, one way students must use their knowledge of polygons is as a guide for measuring the volume of a 3D object or beaker. Also, through studying molecules you have to know the polyhedron shapes they create during bonding in order to correctly identify them.</p>	<p>Mallett, M. (2007). <i>The primary english encyclopedia: the heart of the curriculum</i>. Psychology Press.</p>	

	<p>-In literature and writing, one way students must use their knowledge of polygons is during proofreading and ability to identify the shapes and symbols used.</p> <p>-In social studies, one way students must use their knowledge of polygons is in cartography.</p> <p>-In math, one of the countless ways students use their knowledge of polygons would be through geometry and measurement of areas for shapes or fractions.</p> <p>Aside from these core subject examples I have, there are many other aspects of the curriculum that knowledge of polyhedrons would be beneficial; including areas in art, physical education, shop class, etc.</p>	<p>North carolina standard course of study. (2011). Retrieved from <a href="http://www.ncpublicschools.org/curriculum/">http://www.ncpublicschools.org/curriculum/</a></p> <p>Martinez, J.G., Martinez, N.C. (2007). <i>Teaching Mathematics in Elementary and Middle School Developing Mathematical Thinking</i>. New Jersey: Pearson Merrill Prentice Hall.</p>	<table><tr><th>SYMBOL</th><th>ERROR MARKED</th><th>EXPLANATION</th></tr><tr><td></td><td>He sat  the chair.</td><td>Quad left (ragged right)</td></tr><tr><td></td><td>He sat in the  chair.</td><td>Quad right (ragged left)</td></tr><tr><td></td><td>He sat in the chair.</td><td>Centered copy</td></tr><tr><td></td><td>He sat in the chair.</td><td>Justified copy</td></tr><tr><td></td><td>He sat in the chair.</td><td>Delete characters or words marked</td></tr><tr><td></td><td>He sat in the chair.</td><td>Insert space</td></tr><tr><td></td><td>He sat in the chair.</td><td>Insert letter</td></tr><tr><td></td><td>He sat in the chair.</td><td>Set lowercase</td></tr><tr><td></td><td>He sat in the chair.</td><td>Reset in italics</td></tr><tr><td></td><td>He sat in the chair.</td><td>Reset in roman</td></tr><tr><td></td><td>He sat in the chair.</td><td>Reset in boldface</td></tr><tr><td></td><td>He sat in the chair.</td><td>Set UPPERCASE</td></tr><tr><td></td><td>He sat in the chair.</td><td>Reset in SMALL CAPITALS</td></tr><tr><td></td><td>He sat in the chair.</td><td>Insert period (or appropriate punctuation)</td></tr><tr><td></td><td>He sat in the chair.</td><td>Transpose characters or words marked</td></tr><tr><td></td><td>He sat in the chair.</td><td>Let stand as is (disregard marked above dots)</td></tr><tr><td></td><td>He sat in the chair.</td><td>Insert hyphen</td></tr><tr><td></td><td>He sat in the chair.</td><td>Move as indicated</td></tr><tr><td></td><td>He sat in the chair.</td><td>Insert comma (or appropriate punctuation)</td></tr><tr><td></td><td>He sat in the chair.</td><td>Insert apostrophe (or appropriate punctuation)</td></tr><tr><td></td><td>He sat in the chair.</td><td>Enclose in quotation marks</td></tr><tr><td></td><td>He sat in the chair.</td><td>Draw together (close space)</td></tr><tr><td></td><td>He sat in the chair.</td><td>Words left out that are to be set from copy</td></tr><tr><td></td><td>He sat in the chair.</td><td>Spell out</td></tr><tr><td></td><td>He sat in the chair.</td><td>Start new paragraph</td></tr><tr><td></td><td>He sat in the chair.</td><td>Run in (should not be new paragraph)</td></tr><tr><td></td><td>He sat in the chair.</td><td>Query to author or editor</td></tr><tr><td></td><td>He sat in the chair.</td><td>Insert em dash</td></tr><tr><td></td><td>He sat in the chair.</td><td>Indent 1 em</td></tr><tr><td></td><td>He sat in the chair.</td><td>Indent 2 ems</td></tr></table> 	SYMBOL	ERROR MARKED	EXPLANATION		He sat  the chair.	Quad left (ragged right)		He sat in the  chair.	Quad right (ragged left)		He sat in the chair.	Centered copy		He sat in the chair.	Justified copy		He sat in the chair.	Delete characters or words marked		He sat in the chair.	Insert space		He sat in the chair.	Insert letter		He sat in the chair.	Set lowercase		He sat in the chair.	Reset in italics		He sat in the chair.	Reset in roman		He sat in the chair.	Reset in boldface		He sat in the chair.	Set UPPERCASE		He sat in the chair.	Reset in SMALL CAPITALS		He sat in the chair.	Insert period (or appropriate punctuation)		He sat in the chair.	Transpose characters or words marked		He sat in the chair.	Let stand as is (disregard marked above dots)		He sat in the chair.	Insert hyphen		He sat in the chair.	Move as indicated		He sat in the chair.	Insert comma (or appropriate punctuation)		He sat in the chair.	Insert apostrophe (or appropriate punctuation)		He sat in the chair.	Enclose in quotation marks		He sat in the chair.	Draw together (close space)		He sat in the chair.	Words left out that are to be set from copy		He sat in the chair.	Spell out		He sat in the chair.	Start new paragraph		He sat in the chair.	Run in (should not be new paragraph)		He sat in the chair.	Query to author or editor		He sat in the chair.	Insert em dash		He sat in the chair.	Indent 1 em		He sat in the chair.	Indent 2 ems
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Wonderings (if applicable)	-By following the NCSCOS it flows in a way that makes sense and gradually introduces more advanced polygons and their specifications.	North carolina standard course of study. (2011). Retrieved from <a href="http://www.ncpublicschools.org/curriculum/">http://www.ncpublicschools.org/curriculum/</a>																																																																																														

Reflections	
How My Thinking Changed	How This Will Inform My Teaching
<p>I feel as though this project was a great assignment for me and one that has really helped me realize that I have not retained as much information from elementary school as I thought I had. As I began going over shapes I realized that I couldn't remember all of the names of the triangles, let alone each of their unique properties. However, I feel as though with other shapes and classifications of all shapes (convex, concave, trapezoid, etc.) I remembered much of. I feel I forget so much about triangles and remember so much of the other information because I don't use the names of all six of the triangles on a day to day basis, while on the other hand it's more common that I just say the other shapes in general. One of the aspects of this assignment that I found difficulty in answering was trying to relate polygons to real life situations. At first thought one would think it would be simple to name of instances in life where you use shapes; however, I found it much more difficult to get over the thought of using polygons to identify signs and symbols and stimulate your brain to think toward other life applications.</p>	<p>Because I have realized this about by personal long term learning and memory, I now know that I need to use the different names of the triangles on a day to day basis in the classroom; rather than just practicing them in one lesson and neglecting their specifications and proper names in other areas of study. By focusing this energy on all of the triangles specifically and all year long, my students will have a deeper understanding of each and overall an easier time remembering their details. With this, I also want to make sure that I provide and help my students discover ways in which they can use polygons in their own life or find them in situations. I truly feel that students are most motivated to learn when they find a purpose in their teachings and are able to connect to what the teacher is talking about. Therefore, I will practice activities in class in which I will relate all of my subjects, not just polygons, to other areas of life. I feel as though this project helped me realize these details about myself and my future in teaching, as well as was able to refresh my memory of polygons and their properties.</p>