







Technology-Connected Lesson Plan

Title:	Powerful Polygons
Grade Levels:	2 nd -4th Grades
Curriculum Areas:	☞ Math
Measurable Objectives:	<ul style="list-style-type: none"> ☞ TLW demonstrate an understanding of the use of the properties and relationships in geometry. ☞ TLW distinguish the difference between a regular and irregular polygon. ☞ TLW use an online manipulative to identify properties of a polygon (geoboard).
LA Content Standards:	<ul style="list-style-type: none"> ☞ G-2-M - identifying, describing, comparing, constructing, and classifying geometric figures and concepts; ☞ G-3-M - making predictions regarding transformations of geometric figures (e.g., make predictions regarding translations, reflections, and rotations of common figures); ☞ G-4-M - constructing two- and three-dimensional models; ☞ G-5-M - making and testing conjectures about geometric shapes and their properties;
Grade Level Expectations (GLE)	<ul style="list-style-type: none"> ☞ Geometry <ul style="list-style-type: none"> → Use mathematical terms to classify and describe the properties of 2-dimensional shapes, including circles, triangles, and polygons (G-2-M) → Identify and use appropriate terminology for transformations (e.g., <i>translation as slide, reflection as flip, and rotation as turn</i>) (G-3-M)
K12 Educational Technology Standards:	<ul style="list-style-type: none"> ☞ Technology Productivity Tools (<i>Resource Access and Utilization Foundation Skill</i>) <ul style="list-style-type: none"> → Students use technology tools to enhance learning, increase productivity, and promote creativity. → Students use productivity tools to work collaboratively in developing technology-rich, authentic, student-centered products.

<p>Technology Connection:</p>	<ul style="list-style-type: none"> ☞ Computer w/TV scan converter access ☞ Overhead ☞ Overhead Geoboard ☞ 2D Shapes at Mathsisfun.com http://www.mathsisfun.com/shape.html ☞ Regular & Irregular Polygons http://www.ul.ie/~cahird/polyhedronmode/regular.htm ☞ Online Geoboard (lab setting) <p>http://standards.nctm.org/document/eexamples/chap4/4.2/part2.htm</p>
<p>Procedures:</p>	<ul style="list-style-type: none"> ☞ Start off the lesson by reviewing what the students know about "Geometry." ☞ Together, scan the room to discover different common shapes (square, circle, triangle, rectangle). ☞ Discuss with the students that a polygon is a many sided shape. To be a regular polygon all the sides and angles must be the same. ☞ Using the TV/scan converter connection, go to http://www.mathsisfun.com/shape.html to display other regular polygons. Some of these may not be familiar to the students. Discuss the properties of each polygons (how many sides, angles, etc) ☞ Give each student a dotted paper. Tell the students they are going to go outside to discover geometry. Give the students about 5-10 minutes to draw geometric shapes they see outside. ☞ After returning to the classroom, make a tally chart showing how many of the regular polygons discussed earlier were found. Discuss which polygons were seen more and which ones were not as visible. ☞ Using the TV/scan converter connection, go to http://www.ul.ie/~cahird/polyhedronmode/regular.htm (this site plays classical music, you might want to turn down the volume during instruction time.) Discuss the difference between what is a regular polygon and irregular polygon. ☞ Give the students another sheet of dotted paper. Have the students title this page as, "Regular Polygons." Then have them draw each regular polygon discussed from the site. This is such a great site because you can click on each regular polygon to learn more about its properties. Have the students write the number next to each polygon enforcing how many sides it is

	<p>made of.</p> <ul style="list-style-type: none"> 🖥️ Give the students another sheet of dotted paper following the same steps as above. Write "Irregular Polygons" as the title. Click on the link at the top that says Irregular Polygons. 🖥️ Discuss and compare the difference between regular and irregular polygons. 🖥️ Have the students refer back to the first dotted paper that they used outside. Tell them to select only one of their shapes. Have all the students that selected a regular polygon to stand up. Have them name the polygon and how many sides it has. Try to get the students to recall where the polygon was discovered outside. Next, have students with irregular polygons stand up and explain why their shape is irregular. 🖥️ Introduce the students to the online geoboard and how it works using the presentation setup (TV/scan converter). http://standards.nctm.org/document/eexamples/chap4/4.2/part2.htm 🖥️ This part of the lesson works better in a lab setting. Make sure the students bring their polygon dotted papers used earlier with them to the lab. Allow them about 5 minutes to explore the online geoboard. 🖥️ Tell the students you are going to give them clues about the properties of different regular polygons for them to construct using their online geoboards. Make sure that you cover the following polygons; triangle, square, rectangle, pentagon, hexagon, heptagon, octagon, nonagon, and decagon. 🖥️ If time, allow the student to construct some irregular polygons and discuss what makes them irregular. <p>EXTENDING THE LESSON (optional)</p> <p><i>This is the perfect time to introduce and discuss parallel and perpendicular lines.</i></p> <ul style="list-style-type: none"> 🖥️ Discuss the difference between the two by drawing examples using the board or overhead projector. Draw some shapes showing how some are made with parallel lines and/or perpendicular lines. 🖥️ Have the students make polygons on their geoboards, but this time use the terms parallel and perpendicular lines in your clues.
<p>Materials:</p>	<ul style="list-style-type: none"> 🖥️ Pencils 🖥️ Dotted paper (enough for each student to have three sheets) 🖥️ Use regular geoboards if a computer lab setting is not available

Assessment:	<ul style="list-style-type: none"> Collect dotted paper showing students' drawings of regular and irregular polygons. Observation-Teacher monitors students' work and use on the computer. Take anecdotal records while the students are working.
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