



Technology-Connected Lesson Plan

Title:	Exploring Area and Perimeter
Grade Levels:	4th - 6 th
Curriculum Areas:	Math (Measurement/Geometry)
Measurable Objectives:	<ul style="list-style-type: none"> ☞ TLW discover on their own the formula for learning the area and perimeter of polygons. ☞ TLW develop strategies for estimating the perimeters and areas of shapes. ☞ TLW apply and adapt a variety of appropriate strategies to solve problems. ☞ TLW build new mathematical knowledge through problem solving.
LA Content Standards:	<ul style="list-style-type: none"> ☞ M-1-M - applying the concepts of length, area, surface area, volume, capacity, weight, mass, money, time, temperature, and rate to real-world experiences. ☞ M-2-M - demonstrating an intuitive sense of measurement (e.g., estimating and determining reasonableness of measures). ☞ M-3-M - selecting appropriate units and tools for tasks by considering the purpose for the measurement and the precision required for the task (e.g., length of a room in feet rather than inches).
Grade Level Expectations (GLE)	<ul style="list-style-type: none"> ☞ Model, measure, and use the names of all common units in the U.S. and metric systems (M-1-M) ☞ Estimate time, temperature, weight/mass, and length in familiar situations and explain the reasonableness of answers (M-2-M) ☞ Compare the relative sizes of common units for time, temperature, weight, mass, and length in real-life situations (M-2-M) (M-4-M) ☞ Identify appropriate tools and units with which to measure time, mass, weight, temperature, and length (M-3-M)

K12 Educational Technology Standards:	<ul style="list-style-type: none"> ☞ Students use technology tools to enhance learning, increase productivity, and promote creativity. ☞ Students use appropriate technology resources for solving problems and making informed decisions.
Technology Connection:	<ul style="list-style-type: none"> ☞ Perimeter Explorer http://www.shodor.org/interactivate/activities/permarea/index.html ☞ Area Explorer http://www.shodor.org/interactivate/activities/perm/index.html ☞ Area Graph http://nces.ed.gov/nceskids/graphing/area.asp ☞ Perimeter http://www.beaconlc.org/work/lessons/rrussell/adamant/page1.htm ☞ Area and Perimeter (FunBrain) http://www.funbrain.com/cgi-bin/poly.cgi?A1=s&A2=2&A15=1&INSTRUCTS=1 ☞ Finding the Area and Perimeter of Rectangles (Math Playground) http://www.mathplayground.com/geometryMovie.html
Procedures:	<ul style="list-style-type: none"> ☞ First, ask the students if anyone could tell you what perimeter and area means. Discuss the meaning of "perimeter" and "area". Post a poster in the front with the definitions and examples under each definition. ☞ Have two students come to the front of the room; put a scarf on their eyes so they cannot see. Give each student a cardboard square (2"X2") one with pompoms glued around the edge (perimeter) and the other with pompoms glued all over its surface (area). The students feel their square and describe what they feel to the class. ☞ Remove the scarf and point out that we find "perimeter" of a polygon by measuring each of its sides, then adding the measurements up. Together add how many pompoms are on each side. Write the amount for each side on the board and add them up to get the perimeter of the cardboard square. ☞ Next, discuss the cardboard square that was covered with pompoms. Point out that we find "area" of a polygon by measuring the number of unit squares on the surface of the polygon; only in this example the unit squares will be the pompoms covering the cardboard square. Together add all the pompoms up to get the area of the cardboard square. ☞ Read them the "<u>The Greedy Triangle</u>", as you read the book,

review the names of the polygon shapes. Also, discuss how many sides we would have to measure on each polygon to get its **perimeter**. After reading the story, put an overhead transparency (graph paper) up with the polygons already drawn that were discussed in the story. Discuss how many squares made up each polygon to get its **area**. Explain that sometimes a square on the graph paper gets cut in half. Have examples that take two half squares and count it as one square. Write the results on the transparency in square units.

🖨️ Then, discuss how we could find **perimeter** and **area** using different things other than pompoms and graph paper. Each student should be given a ruler with inches on one side and centimeters on the other. They also need a handout of the same transparency used in the previous step with the polygons discussed in the story. Together measure the sides of each polygon using the centimeter side of the ruler to get the **perimeter** of each polygon. Write the results down by each polygon in units. Students should write the formula for finding **perimeter** on their paper. **Perimeter** = Sum of the measure of all its sides.

🖨️ Have the students draw three rectangles on their graph paper. Review the definition of a rectangle. Students should find the **area** of each rectangle by finding the number of squares enclosed in each one and write their responses next to each rectangle. Remind them to write square units after their responses. Then, ask the students to find the length and width of each of their rectangles. The teacher should work at the overhead with the students modeling what to do. Write the results in a T-chart with Length on the left side and Width on the right of the T-chart. Finally, have the students observe the relationships in the information recorded in the T-chart with their responses for the **area** of each rectangle. After students give their observations orally, discuss how the area of a rectangle is equal to the product of its length and width. Students can write the formula for finding area on their paper (**Area** = Length x Width **Area**=L x W).

🖨️ Finally, give the students another graph sheet with rectangles and squares drawn. Allow them to find the **perimeter** and **area** of each polygon using the information covered in the lesson. Remind them to write their responses for **area** in

	<p>square units and use units for perimeter.</p> <p>☞ It would be beneficial to take the students to the computer lab after this lesson is introduced and allow them to work on an online manipulative of finding area and perimeter.</p> <p><u>Perimeter Explorer</u> http://www.shodor.org/interactivate/activities/permarea/index.html</p> <p><u>Area Explorer</u> http://www.shodor.org/interactivate/activities/perm/index.html</p> <p>At these particular sites students are shown shapes on a grid after setting the area or perimeter and asked to calculate perimeter or area of the shapes.</p> <p>☞ Optional, great interactive sites to further enhance the lesson.</p> <p><u>Area Graph</u> http://nces.ed.gov/nceskids/graphing/area.asp</p> <p><u>Perimeter</u> http://www.beaconlc.org/work/lessons/rrussell/adamant/page1.htm</p> <p><u>Area and Perimeter (FunBrain)</u> http://www.funbrain.com/cgi-bin/poly.cgi?A1=s&A2=2&A15=1&INSTRUCTS=1</p> <p><u>Finding the Area and Perimeter of Rectangles (Math Playground)</u> http://www.mathplayground.com/geometryMovie.html</p>
Materials:	<p>☞ 2 cardboard squares</p> <p>☞ Small pompoms</p> <p>☞ Scarf for covering students eyes</p> <p>☞ <u>The Greedy Triangle</u> by Marilyn Burns</p> <p>☞ Graph Paper overhead transparency</p> <p>☞ Handouts – of graph paper used for transparency</p>
Assessment:	<p>☞ Observation and participation</p> <p>☞ Students responses on their graph paper</p>
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