Comparing Area and Perimeter

Lesson Plan

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Goal: The lesson is designed to help students see connections between area and perimeter and to recognize which shapes maximize enclosed area.

Grade and Course: 8th grade, geometry

KY Standards: MA 08-2.1.1, MA 08-3.1.2

Objectives: 1. Students will know formulas for finding area and perimeter of squares, rectangles, and circles.
2. Students will be able to create figures that have a given perimeter or a given area.
3. Students will know what shapes maximize area for a given perimeter.

Resources/materials needed: worksheet, graph paper, crayons for shading if desired

Description of Plan: In the week leading up to this lesson, we reviewed the formulas for area and perimeter of various polygons, so the students should know those entering this lesson. For this lesson, give each student a few sheets of graph paper. At the beginning of each new section, I would work an example with the students. Then, I let them work together in groups to complete the tables. At the end of each section, we discussed the questions together. They needed the most help on the circle portion, but were then able to see that for a fixed perimeter a circle encloses the most area.

Lesson Source: original

Instructional Mode: Interactive lecture, group activity

Estimated Time: 75 minutes

<u>Comparing Area and Perimeter</u>   Name:_____

On grid paper create as many rectangles as you can having a perimeter 24 units. Record your findings in the chart provided.

Length	Width	Perimeter	Area

If the perimeter is constant which rectangle will produce the largest area?

If the perimeter is constant which rectangle will produce the smallest area?

On grid paper create as many rectangles as you can having an area of 36 units². Record your findings in the chart provided.

Length	Width	Area	Perimeter

If the area is constant which rectangle produces the largest perimeter?

If the area is constant which rectangle produces the smallest perimeter?

Suppose you wanted to help a friend build a rectangular pen for her pot-bellied pig, Elroy. You have 24 yards of fencing in 1-yard sections. Which rectangular shape would be best for Elroy? Explain why this shape is best.

The National Parks Service decided that storm shelters were needed on the trails at Natural Bridge. Storm shelters are required to have 24 square meters of floor space. Suppose that the walls are made of sections that are one meter wide and cost $150 each. Which rectangular shape would be the best to build? Explain why.

Length	Width	Area	Perimeter	Cost

Now suppose we want to look at a circle with a circumference of 24 units. What would the radius of this circle be?

Now use the radius of the circle to find the area of the circle.

How does this compare to the areas of the rectangles we found in the first question?

Next suppose we wanted to make our storm shelter circular. How much would this cost?

What can we conclude about circles when comparing area and perimeter?