LessonTitle: A Fence For Fido (area and perimeter) **Pre 8.2**

Utah State Core Standard and Indicators Pre-algebra Standard 4.2, 5.1 Process Standards 1-5

Summary

In this lesson, students problem solve using area and perimeter. They work on the concept of creating a pen for Fido.

Enduring Understanding	Essential Questions
Solving problems enables us to develop our understanding and practical application of area and perimeter concepts.	
Skill Focus	**Vocabulary Focus**
• Maximum area of rectangles •	

Assessment: This could be used as an assessment

Materials:

Launch

Students can explore the constant perimeter concept using yarn shapes. Students make 50 centimeter loops of yarn. They create and trace 4 different shapes using the yarn loops. They predict how may color tiles it will take to cover the shape areas. Then they cover the areas with tiles. Why do the shapes have so many different areas?

Explore

- Why do some rectangles give more area than others when the perimeters are the same? What kind of a rectangle yields the most area for the amount of perimeter?
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Summarize

Apply

Directions:

Follow the directions on the activity sheets for the following activities***. Have student groups demonstrate their ways of thinking and solving.***

Pre 8.2 A Fence for Fido

Suppose you are trying to make a pen for your dog Fido. The store sells sections of fencing material that are one yard long. The fencing costs $30 a yard and you have only $360. You want to find the biggest rectangular area possible for your pet.

1) What are the possibilities for the length and width of your pen?

Draw the possible rectangles on a sheet of graph paper. Record the measurements below.

Length									
Width									
Area									
Perimeter									

2) Which combination would give you the biggest area?_____

What are your ideas about why this shape would give the dog more area to play in?

3) Suppose you earned $120 to buy more fencing. Now what dimensions will give Fido the most area to play in? Make your prediction._____

Length									
Width									
Area									
Perimeter									

4) Which combination would give you the biggest area?_____

What are your ideas about why this shape would give the dog more area to play in?

5) Use the graphing calculator to discover a pattern using a perimeter of 20 yards.

- Create 4 lists in the calculator, length (L_1), width (L_2), area (L_3), perimeter (L_4).
- Enter in the possible lengths and widths.
- Fix a formula for the perimeter by entering the following. "_____." Enter.
- Fix a formula for the area by entering the following. "_____." Enter

Using the lists, what is the maximum area of Fido's pen? _____
What are the dimensions?_____

6) Now lets use graphs to tell the story.

Create a scatter plot which…

- Compares length with perimeter. Trace the graph. Draw the shape of the graph below. Label the axes.
- Compares length with area. Trace the graph below. Draw below. Label the axes.

Explain the graph relating length with perimeter.

Explain the graph relating length with area.

7) What are your conclusions about the rectangle which gives the most area?

8) After all this work, you realize that you could use the side of the house for one of the sides of the pen. What would you do now with your original $360 worth. Draw below.

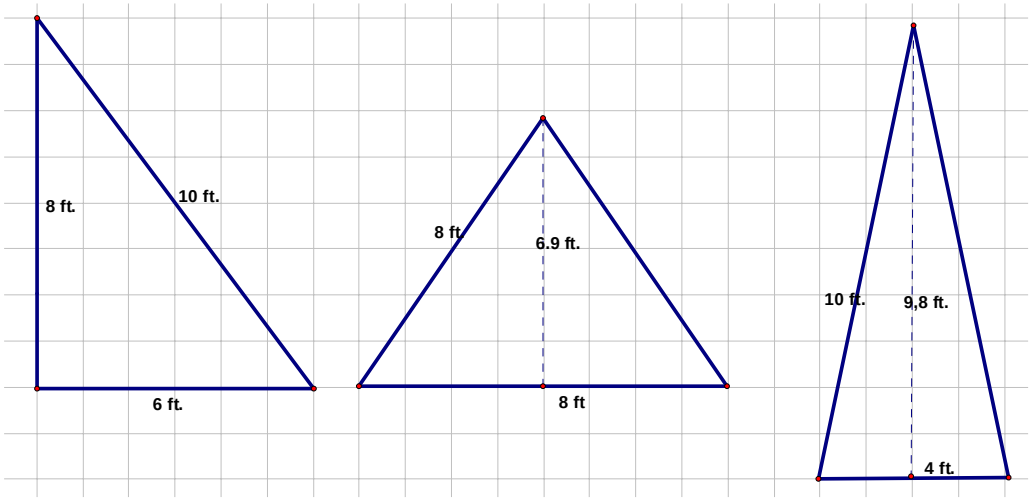
9) If the fencing could bend,

- predict whether or not you could get more area if you made a circle with your original $360 worth of fence. Explain your prediction.

- Prove or disprove your prediction. Show all work below. Use

10) Based on what you learned in A Fence for Fido, predict which triangle will have the greatest area._____

- Find the perimeter and area of each triangle. (Round to the nearest tenth.)



P = _____ P = _____ P = _____

A = _____ A = _____ A = _____

- Was your prediction correct? Why or why not?