

## Learning Project 3 Geometry – Area, Perimeter, & Volume

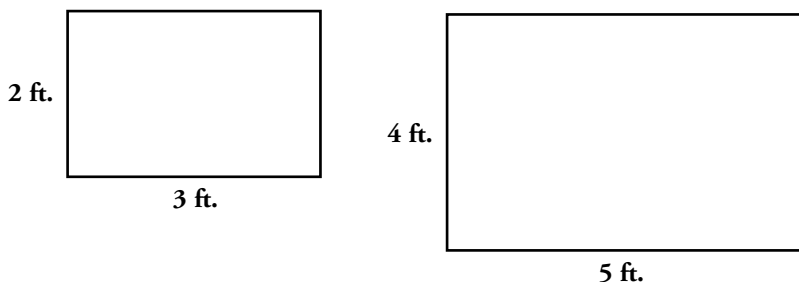
### Inquiry Activity Geometry 8–1: Area vs. Perimeter of Rectangles

*(Note: Italicized portions should be directed to students.)*

#### 1. Identifying the Problem (Item #25 variation, PA) Calculator not allowed

*Read the question carefully, as you would if taking the actual test.*

Lisa, a gardener, has two plots of ground to use for growing plants. She has two questions: How much edging will it take to go around the outside edges of both of these rectangular flowerbeds?



- 1) 26 ft
- 2) 26 ft<sup>2</sup>
- 3) 28 ft
- 4) 28 ft<sup>2</sup>
- 5) 52 ft<sup>2</sup>

**Calculator  
NOT Allowed**



*Here are some problem clarification questions you may want to consider when reading test questions.*

*What words and/or symbols might be important to understand to answer this problem and what are they telling you?*

It is possible that learners would pick edging, rectangular, among others

*What words and/or symbols are unfamiliar and what do you think they mean?*

Cannot know what words the learner will choose.

#### 2. Becoming Familiar with the Problem

*Ask yourself questions like these about the problem, taking note of the ones that were especially helpful, so that you can remember to use them when you take the test.*

*Reread the question.*

*In your own words, what are you being asked to find?*

*Do you know of a math term that represents what you are being asked to find?*



### **3. Planning, Assigning and Performing Tasks**

*Try to answer the test question any way you can, even if you have to guess, but try to be aware of the reasoning and operations that you are using. The following can be helpful.*

*Make a sketch of what is to be found in this item.*

*Try using the formulas page.*

*Estimate an answer.*

*Eliminate some of the answer choices and explain why you eliminated them.*

*Choose an answer and be ready to explain how you found your answer.*

### **4. Sharing with Others**

*Telling other people what you know helps you to understand the material better. So take this opportunity not only to share your knowledge, but also to learn it more completely.*

**Small Groups:** *Compare your answer to others in the group and explain how you found it. Draw a sketch of what you have found. If you have trouble agreeing on one answer, be ready to explain the reasons behind your disagreement.*

There are many possibilities for disagreement. Some may want to multiply rather than add the sides. Some may insist that the answer should be in square feet. Everyone in the class can learn from the disagreements, so they should be brought to the whole-class discussion.

*Explain any help you got from the formulas page.*

*Research the meaning of the unfamiliar words and/or symbols from this problem and the math word (if it was discussed in the group) that can be used to explain what the question is asking you to find.*

**Whole class:** *Report your group's answer (or your disagreement over the answer) to this question, along with a sketch of what you have found, an explanation of how the formulas page can help, and the words and/or symbols and their definitions that were discussed in your group.*

*Take notes on any different ways that others used to find the answer.*

### **5. Reflecting, Extending and Evaluating**

Make sure that everyone knows that they found the distance around the rectangles. The units used are units of length (one-dimensional) rather than the square units that they found in an earlier version of this problem. They should see that they could find the distance around the rectangles by merely adding the sides, without any reference to a formula. Finally, the formula should be discussed.

Errors caused by confusion between area and perimeter are common on tests. We hope that we can reduce these by explicitly examining the difference between them in their physical attributes, the type of units used by each and the applications of each. Display three measuring units during this discussion: a piece of string that is 1 foot long, a 1 square foot piece of newsprint (a small piece that is 1 square inch would also be helpful), and a cubic inch. (Any size cube will do, if you cannot find a cubic inch.)

**Reflect:** *Think about what you learned.* (group activity or instructor led)

*Here are some questions to start you thinking about the experience you just had. Thinking about what you have learned and experienced is part of the learning process. When the focus is only on the answer, you don't get much time to think about what was learned.*

Use a piece of grid paper and draw two rectangles that look like the ones in the problem. One should be 2 units by 3 units, and the other should be 4 units by 5 units.

I prefer using the centimeter square grid paper. Common quarter-inch grids are too small to be effective in this activity.

Start at one corner of a rectangle, go all the way around it, counting the spaces (units) that you pass as you go by. Do the same thing with the other rectangle.

How many units did you pass altogether?

The mathematical word for what you have found is “perimeter”. Some teachers tell their students to notice the “rim” in perimeter. Explain why this could be helpful. Which of the measuring units on display would be used to measure the rim?

Find the formula for the perimeter of a rectangle on the formulas page. Compare what it tells you to do with what you have been doing. What are the similarities and differences between the methods? Which do you prefer and why?

Earlier, in Learning Project #6, you saw these same rectangles and were asked to find their area. Use the grid-paper rectangles again, but now count the number of squares in each rectangle.

It really won't matter whether you do this before or after LP#6, since the concept of area of a rectangle is fairly commonly known.

**Extending:** *Extend what you learned to new situations.*

**In extending, you are being asked to transfer the information presented in the Practice Test question to other information or situations you already know and maybe make new connections to other information.**

As you discussed above, when you find the perimeter of a figure, you are finding the length of something that would go all the way around it. Discuss situations in your lives that would require you to find perimeter.

Be prepared to use the information in this Inquiry Activity to help answer questions in Inquiry Activity 8-2.

**Evaluating:** *Assess what you learned and how you learned it.*

**In this last step, you get a chance to review the content of what you learned and the methods used to learn. There are no right or wrong answers to these questions; it is your chance to look more closely at your learning style and the opportunity to state how you benefited or didn't benefit from the content and/or the methods to help you pass the GED test.**

What progress did you make in achieving your personal math goals by participating in this activity?

Of all the things that you learned in this activity, what do you consider to be the most important for you to remember while taking the test?

Which things do you think will be the most important to you in your life?

Ask for practice exercises, if you think you need them.