

Today we will use the program Geometer’s Sketchpad to investigate the ideas of area and perimeter. We will just be scratching the surface of what Geometer’s Sketchpad can do, but this should give you an idea of possible ways to use computers in your classrooms.

To start with, we need to open the program:

Start

All Programs

Standard Software

Design Tools

Geometer’s Sketchpad

Familiarize yourself with the layout of the program. Menus are along the top and tools are on the left.

Use the Graph menu to select the “Show grid” option.

Use the straightedge tool on the left to draw a line segment. Continue this process until you have a quadrilateral. When you have completed this, select the selection arrow tool.

Highlight one side of your quadrilateral by clicking on it. From the Measure menu select “length.”

You should have a box that says “mAB = some number.” In addition, your quadrilateral is now labeled with A and B on two vertices.

Do the same thing for the other sides of the quadrilateral (before selecting the next side you need to click away from the figure and the box so that they are no longer highlighted). When you are done, there should be four labeled vertices and four side lengths. Note that by selecting a point and dragging the mouse, you can change the shape of the quadrilateral.

Now use the selection tool to highlight all four vertices. After you have done this, press Ctrl+P. The quadrilateral will be filled in. Use the appropriate options in the Measure menu to determine the perimeter and area of the quadrilateral.

Move the points and the sides of your quadrilateral by clicking and dragging with the mouse. Notice that the area and perimeter change. Are there ways to move a point or side so that the perimeter does not change? Are there ways to move a point or line so that the area does not change?

Experiment, compare with your neighbors, and try to answer the following questions:

Can quadrilaterals with different perimeters contain the same area?

Can quadrilaterals with different areas have the same perimeter?

What quadrilateral with a perimeter of 30 cm contains the largest area?

What is the smallest area you can find of a quadrilateral with a perimeter of 30 cm?

What triangle with a perimeter of 30 cm contains the largest area?

What pentagon with a perimeter of 30 cm contains the largest area?

What shape with a perimeter of 30 cm contains the largest area?