

Examining Area and Perimeter

Materials: 1” squares, pentominoes, graph paper, pencil

In this activity, we are going to examine the relationship between area and perimeter. Remove a handful of 1” squares from your baggie and all of the shapes from the other baggie.

1. How many 1” squares does it take to make each shape from the other baggie? _____ Therefore, the area of each pentomino is _____.

★ These are called pentominoes because “penta-” is the Greek prefix for “five”. The “-ominoes” suffix comes from the idea that two squares put together edge to edge are commonly called “dominoes”, with the “do” representing “two”.

2. How many different pentominoes do you have? _____

★ If you put five 1” squares together edge to edge, you can make at most twelve different pentominoes. Any other shapes you can make with five 1” squares put together edge to edge will be one of the original twelve shapes either flipped over or rotated.

3. On your graph paper, draw each of the pentominoes to scale where each block on your grid paper represents one 1” square.

4. Each pentomino has a name that corresponds to the letters of the alphabet **F L I P N T U V W X Y Z**. Discover the name of each pentomino by looking at the shape.

5. We discovered that the area of each pentomino is 5 in^2 . Do you think each pentomino also has the same perimeter? _____

6. Refer to the drawings on your graph paper and find the perimeter of each pentomino. List its perimeter below.

| | | | |
|----------|----------|----------|----------|
| F: _____ | P: _____ | U: _____ | X: _____ |
| L: _____ | N: _____ | V: _____ | Y: _____ |
| I: _____ | T: _____ | W: _____ | Z: _____ |

7. So, do all pentominoes have the same perimeter? _____ If not, which ones are different? _____

★ Put your pentominoes aside and put sixteen 1” squares into your workspace.

8. Make every possible rectangle with sixteen 1” squares and list their dimensions below. (Two rectangles having the same dimensions are considered the same rectangle.)

9. Find the perimeter of each rectangle and put it in the chart below.

| Dimensions | Perimeter | Specific Shape |
|------------|-----------|----------------|
| | | |
| | | |
| | | |

Which has the largest perimeter? _____

Which has the smallest perimeter? _____