

# TAKE IT TO THE MAT

A NEWSLETTER ADDRESSING THE FINER POINTS OF MATHEMATICS INSTRUCTION



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Last month, we looked at the roots of the terms **perimeter** and **circumference**. Literally, the two words mean to “measure around” or “carry around.” In this issue of *Take It to the MAT*, we’ll highlight area.

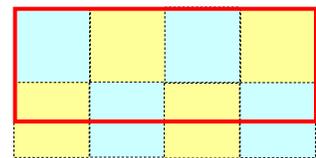
**Area** comes from the Latin *area* or “open space.” If we’re looking for other words that connect to area, we’re hard pressed to find any. The word **are**, an area of 100 square meters—not a form of “be”—is derived from *area*. There’s not much else beyond that, unlike our discussions of words like perimeter, polygon, and quadrilateral in previous issues. So, let’s just deal with “open space.” Think of open spaces, like playgrounds, meadows, or parks. We’re really talking about a two-dimensional measurement—the measure of a *plane* or planar region.

Recall that perimeter is a linear measure—a distance, one-dimensional; it uses linear units. We measure in feet, meters, miles, etc. Area is two-dimensional and requires a two-dimensional unit. The convention is to use a square—square feet, square meters, square miles. In other words, perimeter is the number of linear units we need to go around a figure, area is the number of square units needed to “cover” the region.

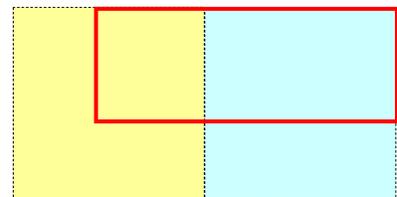
What is the area of the rectangle at right—how many squares are required to cover the figure? That depends on the square unit we are using. Will we use a square inch or a square centimeter? It’s a similar question as to what its perimeter is. Will we measure the distance around it in inches or centimeters? Once we decide on the unit, it should be fairly easy to determine. Let’s use square centimeters.



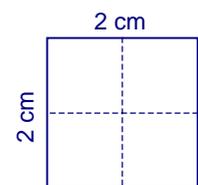
**1 sq. cm**  
A square centimeter is this size: So, how many cover the rectangle? Looks like 4 full squares and 4 half-squares or 6 square centimeters.



**1 sq. inch**  
What if we wanted square inches? That’s a little tougher, but we can *estimate* it using some fraction sense. It looks like a little over half of the right square (blue) covers the rectangle and a little over one-fourth of the left square (yellow) covers it. So the area is more than three-fourths square inch, but not quite one.



One more thing about our use of language in finding area. What is the area of a 2-cm square? Answer: 4 square cm. When we speak of a 2-cm square, we are looking at a square with sides of length 2 cm (shown at right), *not* a square with an area of 2 square cm.



Just wondering: what would be the dimensions of a square with an area of 2 square cm?