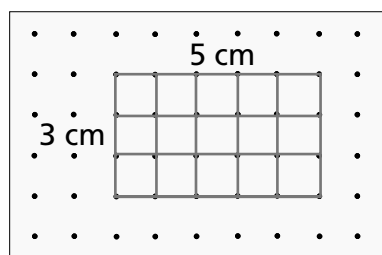


Teaching Unit D (Continued)

Math Background

Area and Perimeter In the previous units, students found the perimeter of rectangles by measuring and adding lengths of sides, and the area of rectangles by counting squares. They also used area models for multiplication. In the first lesson of Unit D, students find the perimeter and area of figures drawn on centimeter dot arrays. Most students will find these measures by counting individual unit segments or unit squares.

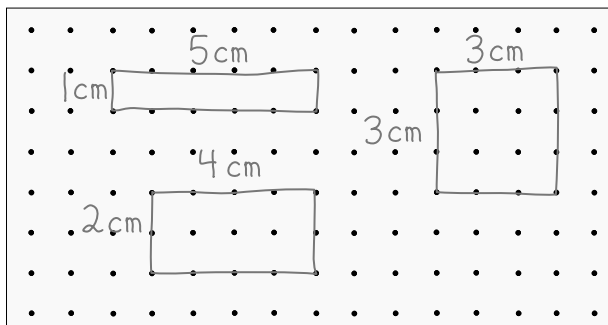


$$\text{Perimeter} = 5 + 5 + 3 + 3 = 16 \quad 16 \text{ cm}$$

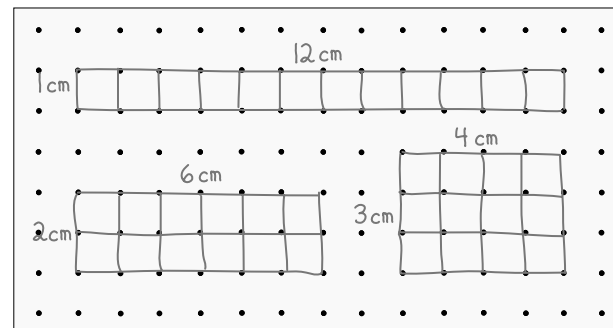
$$\text{Area} = 3 \times 5 = 15 \quad 15 \text{ sq cm}$$

Real-World Problems with Area and Perimeter In this unit, students consider some real-life problems and determine whether the solution requires them to find perimeter or area.

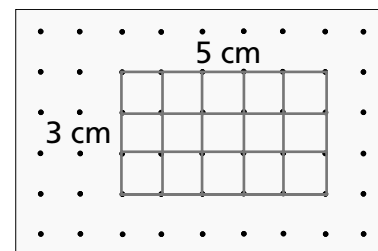
Relating Perimeter and Area In this unit's activities, students draw on a dot array all the possible rectangles with a given perimeter and then find the area of the rectangles. They observe that rectangles with the same perimeter can have different areas, and they discuss how the shape of a rectangle is related to its area. Specifically, for a given perimeter, the longest, skinniest rectangle has the least area and the most "square-like" rectangle has the greatest area.



Students are also required to draw all the possible rectangles with a given area and find the perimeters. They observe that rectangles with the same area can have different perimeters and they discuss how the shape of the rectangle is related to the perimeter. Specifically, for a given area, the longest, skinniest rectangle has the greatest perimeter and the most "square-like" rectangle has the least perimeter.



Algebraic Formulas As students progress through this unit, most of them will develop shortcuts that allow them to find the perimeter and area of rectangles without counting unit segments or unit squares. In the last lesson, students generalize these shortcuts as rules, first in words and then with algebraic symbols. Then they have opportunities to use these rules, or formulas, to find perimeter and area of rectangles.



$$\text{Perimeter} = (2 \times 5) + (2 \times 3) = 10 + 6 = 16 = 16 \text{ cm}$$

$$\text{Area} = 5 \times 3 = 15 = 15 \text{ sq cm}$$