SPATIAL SENSE AND GEOMETRY
Apply Principles of Congruence, Similarity, and Transformations

Note To the Teacher: The goal of **You Be the Teacher** is to encourage each student to think independently. There are many possible ways to find and express the solutions. Discuss possible approaches to solve the problems, then ask students to score the responses according to the directions in the student book. In the teacher's edition you will find an analysis and score of each of the responses written by experienced teachers such as yourself.

Possible Solution:

This problem assesses the student's understanding of area, perimeter, congruency in pattern, and pattern recognition.

It would take 22 toothpicks to make Figure 10. There are two rows of toothpicks: one on the top and one on the bottom of the rectangle. The number of toothpicks in each row is the same number as the number of the figure. There are also two vertical toothpicks on the ends, so 2 x 10 + 2 = 22.

2*N* + 2 describes the number of toothpicks for the *Nth* figure. Each figure always has two rows of toothpicks; each row has the same number of toothpicks as the number of the figure, *N*. Two vertical toothpicks form the ends of each rectangle.

The area of Figure 5 is 5 square units. The area of the first figure is 1 square unit; therefore, the number of squares in each of the subsequent figures is the same as the number of the figure, *N*. Simply multiply *N* by 1 square unit to find the area. So the answer for Figure 5 is 5 square units.

The area of the *Nth* rectangle is *N* square units because the number of squares in each rectangle equals the number of the figure. So *N* x 1 = *N*.

Figure 20 would have a perimeter of 42 toothpicks because 2 x 20 + 2 = 42. Its area would not be 22 square units because 20 x 1 = 20, not 22.