Name: Key

Expression vs. Equation Models

Toothpick Triangles

Variable expressions can be used to represent patterns and help solve problems. Consider the problem of creating triangles out of toothpicks shown below.

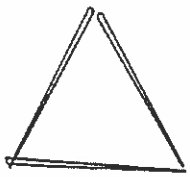


Figure 1

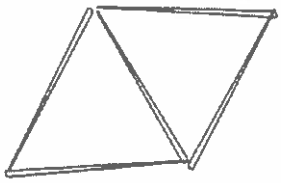


Figure 2

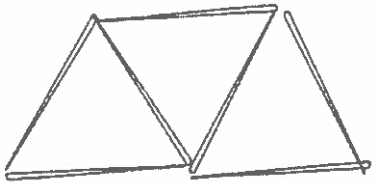
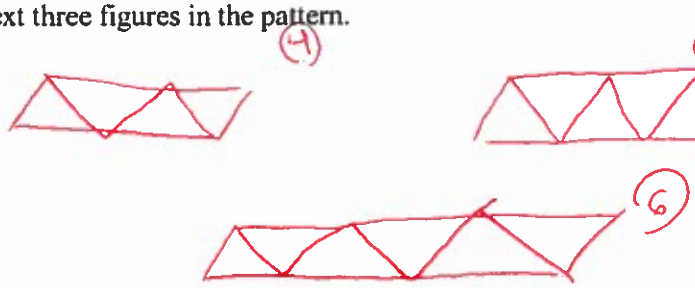


Figure 3

1. How many toothpicks does it take to create each figure? 3, 5, 7

2. How many toothpicks does it take to make up the perimeter of each image? 3, 4, 5

3. Sketch the next three figures in the pattern.



4. Continue the pattern to complete the table.

Image Number	1	2	3	4	5	6	7	8	9	10
Number of toothpicks	3	5	7	9	11	13	15	17	19	21
Number of toothpicks in Perimeter	3	4	5	6	7	8	9	10	11	12

5. Let the variable n represent the figure number. Write an expression that can be used to find the number of toothpicks needed to create figure n.

$2n+1$

6. Let the variable n represent the figure number. Write an expression that can be used to find the number of toothpicks in the perimeter of figure n.

$n+2$

7. GEOMETRY The surface area of the side of a right cylinder can be found by multiplying twice the number π by the radius times the height. If a circular cylinder has radius r and height h, write an expression that represents the surface area of its side.

$2\pi rh$