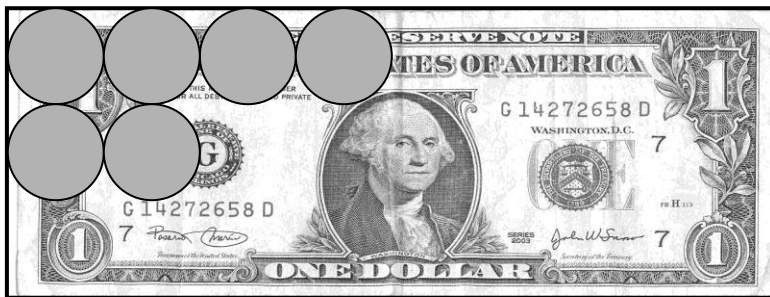# Nicole's Dollar

Read all parts of the open-response question before you begin. Write your answers to the open-response question on the answer page. For each open-response question, use the grid provided to create any required charts or graphs. If a question does not require a chart or graph, write your written response over the grid lines.

Nicole is using chips to measure the area and perimeter of a dollar bill.

a) How many whole chips will fit on the dollar bill? Explain your reasoning.

b) If the diameter of each chip is 2 cm, what is the perimeter of the dollar bill? Explain your reasoning.

c) If the diameter of each chip is 2 cm, what is the approximate area of the dollar bill? Explain your reasoning.

BE SURE TO LABEL YOUR RESPONSES (a), (b), and (c).

Nicole's Dollar

Rubric Scoring Guide
a) 1 point: Correctly identifying the number of chips that will fit on the dollar bill
   1 point: Accurate and thorough explanation; appropriate math vocabulary as needed
      OR ½ point: Limited explanation or vocabulary

b) 1 point: Correctly identifying the perimeter of the bill
   1 point: Accurate and thorough explanation; appropriate math vocabulary as needed
      OR ½ point: Limited explanation or vocabulary

c) 1 point: Correctly identifying the approximate area of the bill
   1 point: Accurate and thorough explanation; appropriate math vocabulary as needed
      OR ½ point: Limited explanation or vocabulary

* A score of 4 may not be earned unless correct units are used.

You earned:	Your score is:
6 points	4
4.5-5.5 points	3
3.0-4.0 points	2
0.5-2.5 points	1
0 points	1 -- your answers demonstrates minimal understanding **OR** 0 -- your answer is irrelevant

Grade Level: 3rd (Perimeter) and 6th (area)
KY.3, MD.8
KY.6.G.1

Students will find perimeter of regular and irregular polygons in metric and U.S. customary units

Students will find area of plane figures composed of triangles, squares and rectangles by subdividing and measuring; use square units appropriately

       Students will determine:
- Measures of rectangles and figures that can be divided into rectangular shapes, including lengths to the nearest eighth of an inch or nearest centimeter; and
- The area and perimeter of triangles and quadrilaterals (rectangles, squares). (Using the Pythagorean Theorem will not be required as a strategy.)

DOK: 2

Nicole's Dollar

Nicole's Dollar

A)   **24 chips will fit on the dollar bill.**

There are two chips placed on the side of the bill. These appear to cover 2/3 of the side, therefore, 1 more chip would fully cover the side. 2+1=3   Therefore, the side of the bill is 3 chips wide.
There are four chips placed across the top length of the dollar bill. These four chips cover ½ of the length. 4 x 2 =8   Therefore, the bill is 8 chips long. 3 chips wide x 8 chips long = 24 chips. (Students might also draw a picture to demonstrate the 24 chips covering the bill.)

B) Since the diameter of each chip is 2 cm, we multiply the number of chips by 2 to find the length and wide in cm.

Length=8 chips=16cm
Width=3 chips=6 cm

2(length) + 2(width)=Perimeter OR   Length + length + width + width =Perimeter

   2(16) + 2(6) =Perimeter
     32 + 12= Perimeter
         44 = Perimeter

The perimeter of the dollar bill is 44cm.

C)   Since the diameter of each chip is 2 cm, we multiply the number of chips by 2 to find the length and wide in cm.

Length=8 chips=16cm
Width=3 chips=6 cm

Length x Width = Area
16 x 6 = 96 square cm

The approximate area of the dollar bill is 96 square cm.

Author: Paula Cissell; Veda Wylie adapted from "Scoring High on the Terra Nova" multiple choice item

Nicole's Dollar