<table>
<thead>
<tr>
<th><strong>7th grade</strong></th>
<th><strong>Task 2</strong></th>
<th><strong>Hexagons</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Task</strong></td>
<td>Find and extend a number pattern in the context of hexagonal designs. Give a rule or formula for determining the perimeter of each growing design.</td>
<td></td>
</tr>
<tr>
<td><strong>Core Idea 2</strong></td>
<td>Understand relations and functions, analyze mathematical situations and use models to solve problems involving quantity and change.</td>
<td><strong>Algebra and Functions</strong></td>
</tr>
<tr>
<td><strong>• Represent, analyze, and generalize a variety of functions including linear relationships</strong></td>
<td></td>
<td><strong>• Express mathematical relationships using expressions and equations</strong></td>
</tr>
<tr>
<td><strong>• Use symbolic algebra to represent situations to solve problems</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Seventh Grade – 2003
Hexagons

This problem gives you the chance to:
• recognize and extend a number pattern in a geometric situation
• find a rule for the pattern

Maria has some hexagonal tiles.
Each side of a tile measures 1 inch.
She arranges the tiles in rows; then she finds the perimeter of each row of tiles.

1 tile
perimeter = 6 in.

2 tiles
perimeter = 10 in.

3 tiles

4 tiles

Maria begins to make a table to show her results.

<table>
<thead>
<tr>
<th>Number of tiles in a row</th>
<th>Perimeter in inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

1. Fill in the empty spaces in Maria’s table of results.
What will be the perimeter of 5 tiles? _________________ inches
2. Find the perimeter of a row of 10 tiles. 
   _______________ inches
   Explain how you figured it out.

3. Write a rule or formula for finding the perimeter of a row of hexagonal tiles when you know the number of tiles in the row.
   Let \( n \) = the number of tiles, and \( p \) = the perimeter.

4. Find the perimeter of a row of 25 hexagonal tiles.
   Show your work.
   _______________ inches

5. The perimeter of a row of hexagonal tiles is 66 inches.
   How many tiles are in the row?
   _______________
## Hexagons

The core elements of performance required by this task are:
* recognize and extend a number pattern in a geometric situation
* find a rule for the pattern

Based on these, credit for specific aspects of performance should be assigned as follows:

<table>
<thead>
<tr>
<th>Points</th>
<th>Section Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 1. Completes the table correctly by writing in the numbers:

<table>
<thead>
<tr>
<th>Number of tiles in a row</th>
<th>Perimeter in inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
</tr>
</tbody>
</table>

Gives correct answer as:
22 inches

### 2. Gives correct answer as:
42 inches

Gives a correct explanation such as:
The perimeter increases by 4 each time:
\[22 + 5 \times 4 = 42\]

### 3. Gives a correct rule such as:
\[p = 4n + 2\]

Accept verbal equivalents.

### 4. Gives correct answer as:
102 inches

Shows correct work such as:
\[p = 4 \times 25 + 2 = \]

### 5. Gives correct answer as:
16

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Seventh Grade – 2003