Stage 4 Mathematics student work sample – Grade B

Tunnel Patterns

These ‘tunnels’ have been constructed using centicubes. The diagrams represent the construction of 1 tunnel and 2 tunnels.

1. Using centicubes, construct the structure for 3 tunnels. Draw the diagram representing the construction of 3 tunnels.

2. Complete the table:

<table>
<thead>
<tr>
<th>Number of tunnels (T)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of centicubes (C)</td>
<td>5</td>
<td>8</td>
<td>11</td>
<td>14</td>
<td>17</td>
</tr>
</tbody>
</table>

3. How many centicubes are required to construct 20 tunnels? Write the rule used for this calculation, using words or algebraic symbols. Explain how you obtained this rule.

62 centicubes

Add 3 for each tunnel after 1 x

\[ T = 3n + 2 \]

It works on the table above

Grade Commentary

Cameron demonstrates understanding of geometric patterns. A rule that uses the given pronumerals appropriately and a clearer explanation of its formulation would enhance the response.

Cameron’s response demonstrates characteristics of work typically produced by a student performing at a grade B standard.