Chapter Task

Expectations

• represent, through investigation with concrete materials, the general term of a linear pattern, using one or more algebraic expressions
• translate statements describing mathematical relationships into algebraic expressions and equations
• evaluate algebraic expressions with up to three terms, by substituting in fractions, decimals and integers for the variables
• make connections between solving equations and determining the term number in a pattern, using the general term

Use this task as a performance assessment, to give you a sense of students’ understanding of patterning and algebra.

Preparation and Planning

<table>
<thead>
<tr>
<th>Pacing</th>
<th>5 min Introducing the Chapter Task</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40 min Using the Chapter Task</td>
</tr>
</tbody>
</table>

Materials

• rulers
• calculators
• paper
• pencils
• erasers
• Optional: linking cubes
• Chapter 4 Task Pages 1 & 2, pp. 54–55

Enabling Activities

• Create pattern rules from models. (See Lesson 4.2)
• Determine the general term of a sequence. (See Lesson 4.3)
• Solve problems by examining a simpler problem. (See Lesson 4.4)
• Relate number sequences to graphs. (See Lesson 4.5)

Nelson Web Site

Visit www.mathK8.nelson.com and follow the links to Nelson Mathematics 8, Chapter 4.

Mathematical Processes

Problem Solving, Connecting

Introducing the Chapter Task

(Whole Class) about 5 min

Together, read all the information on Student Book page 148. Demonstrate to students what a pyramid-type display looks like. Ask them what they must think about before they can determine which option they should use to make their display.

Using the Chapter Task

(Pairs) about 40 min

Students can complete the task in pairs. They can use Chapter 4 Task Pages 1 & 2, pp. 54–55 to record their answers. If any students need extra support, allow them to build models of the pyramids using linking cubes or other blocks. Remind students to use the Task Checklist as a way to help them produce an excellent solution. As students work through the task, observe and/or interview them individually to see how they are interpreting and carrying out the task.
Assessing Students’ Work

Use the Assessment of Learning chart as a guide for assessing students’ work.

### Assessing Students’ Work

**Assess the Assessment of Learning chart as a guide for assessing students’ work.**

**Assessment of Learning—What to Look for in Student Work…**

<table>
<thead>
<tr>
<th>Assessment Strategy: Interview/Observation and Product Marking</th>
<th>Problem Solving/Thinking</th>
<th>Plan: Make a Plan</th>
<th>Do: Carry out the Plan</th>
<th>Application of Learning</th>
<th>Communication Explanation and Justification of Mathematical Concepts, Procedures, and Problem Solving</th>
<th>Organization of Material (written, spoken, or drawn)</th>
<th>Use of Mathematical Representations (graphs, charts, diagrams)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level of performance</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Problem Solving/Thinking</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Understand the Problem</td>
<td>• shows limited understanding of the problem (i.e., is unable to identify sufficient information and the relationship between the algebraic expression and the option chosen; is unable to restate the problem)</td>
<td>• shows some understanding of the problem (i.e., is able to identify some of the relevant information and the relationship between the algebraic expression and the option chosen; may have difficulty rephrasing the problem)</td>
<td>• shows complete understanding of the problem (i.e., is able to identify relevant information and the relationship between the algebraic expression and the option chosen; is able to rephrase the problem)</td>
<td>• shows thorough understanding of the problem (i.e., is able to differentiate between relevant and irrelevant information and the relationship between the algebraic expression and the option chosen; is able to rephrase the problem)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan: Make a Plan</td>
<td>• shows little or no evidence of a plan</td>
<td>• shows some evidence of a plan</td>
<td>• shows evidence of an appropriate plan</td>
<td>• shows evidence of a thorough plan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do: Carry out the Plan</td>
<td>• uses a strategy and attempts to solve problem but does not arrive at an answer</td>
<td>• carries out the plan to some extent, using a strategy, and develops a partial and/or incorrect solution</td>
<td>• carries out the plan effectively by using an appropriate strategy and solving the problem</td>
<td>• shows flexibility and insight when carrying out the plan by trying and adapting, when necessary, one or more strategies to solve the problem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application of Learning</td>
<td>• demonstrates limited ability to apply mathematical knowledge and skills in familiar contexts (i.e., to determine the appropriate pyramid option)</td>
<td>• demonstrates some ability to apply mathematical knowledge and skills in familiar contexts (i.e., to determine the appropriate pyramid option)</td>
<td>• demonstrates considerable ability to apply mathematical knowledge and skills in familiar contexts (i.e., to determine the appropriate pyramid option)</td>
<td>• demonstrates sophisticated ability to apply mathematical knowledge and skills in familiar contexts (i.e., to determine the appropriate pyramid option)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applying Knowledge and Skill in Familiar Contexts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication Explanation and Justification of Mathematical Concepts, Procedures, and Problem Solving</td>
<td>• provides limited or inaccurate explanations/justifications that lack clarity or logical thought, using minimal words, pictures, symbols, and/or numbers of the appropriate number of rows required in their pyramid</td>
<td>• provides partial explanations/justifications that exhibit some clarity or logical thought, using simple words, pictures, symbols, and/or numbers of the appropriate number of rows required in their pyramid</td>
<td>• provides complete, clear, and logical explanations using appropriate words, pictures, symbols, and/or numbers of the appropriate number of rows required in their pyramid</td>
<td>• provides thorough, clear, and insightful explanations/justifications, using a range of words, pictures, symbols, and/or numbers of the appropriate number of rows required in their pyramid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization of Material (written, spoken, or drawn)</td>
<td>• organization is limited and seriously impedes communication</td>
<td>• some organization is evident</td>
<td>• organization is effective and supports communication</td>
<td>• organization is highly effective and aids communication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of Mathematical Representations (graphs, charts, diagrams)</td>
<td>• uses representations that exhibit limited clarity and accuracy, and are ineffective in communicating</td>
<td>• uses representations that exhibit some clarity and accuracy</td>
<td>• uses representations that are clear and accurately communicate information</td>
<td>• uses representations that are clear, precise, and effective in communicating</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Adapting the Task

You can adapt the task in the Student Book to suit the needs of your students. For example:
- Group students according to ability.
- Allow students to use a calculator.
- Challenge stronger students to complete this chapter task individually.