

<p>Curriculum Expectation(s): Grade 5: Determine through investigation, using stacked congruent rectangular layers of concrete materials, the relationship between the height, the area of the base, and the volume of a rectangular prism</p> <p>Grade 6: Solve problems involving the estimation and calculation of the surface area and volume of rectangular prisms</p>	<p>Learning Goal <i>Determine the relationship between surface area and volume</i></p> <p>Success Criteria</p> <ul style="list-style-type: none"> • Different-shaped boxes or rectangular prisms with the same volume can have different surface areas • When volume stays the same, the surface area/amount of packaging decreases the more cube-like the box 	<p>Learning Goal <i>Communicate math thinking orally and in writing, using math vocabulary (ongoing)</i></p> <p>Success Criteria:</p> <ul style="list-style-type: none"> • Appropriate vocabulary (e.g., surface area, volume) is used to describe mathematical ideas and thinking • Charts and tables can help show mathematical relationships and patterns • The way information is organized can make thinking visible to others 	<p>Learning Goal <i>Communicate effectively when working with a partner (ongoing)</i></p> <p>Success Criteria:</p> <ul style="list-style-type: none"> • See video for a variety of criteria being reviewed and modelled
<p>BIG IDEAS Measurement Relationships</p> <ul style="list-style-type: none"> • Relationships exist among units and measurable attributes, including the area, perimeter and volume of two- and three-dimensional objects (<i>A Guide to Effective Instruction Kindergarten to Grade 6: Measurement, Grades 4 to 6</i>, p. 33) • “The area of an object is a two dimensional attribute....Area can be a single measure of a 2-D shape on an object or a combined measure of a 3-D shape, like surface area” (<i>Big Ideas from Dr. Small, Grades 4-8</i>, Nelson 2009, p. 136) 			

<p>Part 1: MINDS ON/ACTIVATION/BEFORE String</p> <p>3x4 3x8 6x8 12x4</p>	<p>Part 2: ACTION/WORKING ON IT/DURING (continued)</p> <table border="0"> <tr> <td data-bbox="768 704 1300 1408"> <p>Anticipated Student Responses</p> <ol style="list-style-type: none"> 1. A chart or a table to organize all possible solutions 2. Trial and error – building different models 3. Find the area of one layer and use repeated addition to see if they use all 24 cubes 4. Students may use knowledge of the “Packaging the Chocolongo Bar” problem (and recognize that a cube-like shape results in the least amount of packaging) <p><i>FYI</i> ‘Chocolongo Bar’ problem is found in <i>A Guide to Effective Instruction in Mathematics, Kindergarten to Grade 6: Measurement, Grades 4 to 6</i>, p. 109</p> </td> <td data-bbox="1300 704 1779 1408"> <p>Prompting Questions</p> <ul style="list-style-type: none"> – Do you have all possible ways? How do you know? – What do you know about the number 24? </td> </tr> </table>		<p>Anticipated Student Responses</p> <ol style="list-style-type: none"> 1. A chart or a table to organize all possible solutions 2. Trial and error – building different models 3. Find the area of one layer and use repeated addition to see if they use all 24 cubes 4. Students may use knowledge of the “Packaging the Chocolongo Bar” problem (and recognize that a cube-like shape results in the least amount of packaging) <p><i>FYI</i> ‘Chocolongo Bar’ problem is found in <i>A Guide to Effective Instruction in Mathematics, Kindergarten to Grade 6: Measurement, Grades 4 to 6</i>, p. 109</p>	<p>Prompting Questions</p> <ul style="list-style-type: none"> – Do you have all possible ways? How do you know? – What do you know about the number 24? 	<p>Part 3: CONSOLIDATE-HIGHLIGHT-SUMMARY-PRACTICE/AFTER</p> <p>Communication Strategies</p> <p><i>Note: Not all of these strategies would necessarily be used in a single lesson. They have been all included in this resource for demonstration purposes.</i></p> <ul style="list-style-type: none"> – Gallery Walk – look at your classmates’ work and think about what similarities there are between their work and your work? – Math Congress – Select solutions to show the link between the area of the bottom and the number of layers and the connection between surface area and volume – Vocabulary – base, volume, surface area – Ticket out the Door – Focus on process learning goal of communication and the surface area/volume learning goals. Ask students: <ul style="list-style-type: none"> ○ “What did you learn today?” ○ “What will you do tomorrow to improve your learning?”
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<p>Accommodations and Modifications: Problem allows for a variety of solutions and will provide assessment information relative to student understanding of surface area and volume. Students will work in partners.</p>					
<p>Resources and Materials: connecting cubes, sample package, chart paper, markers</p>					