** Mathematics Assignment 11**

**Snack Shack Design**

**Date:** Due

**Overview:**

The student council has agreed to pay for the materials for a Snack Shack. School clubs can use the booth to sell food at lunch time and at sporting events to raise money.

**Preparation Work and Tasks:**

1. Sketch a model of the Snack Shack. The shack must include a rectangular prism and a cylinder. **(3)**
2. Draw a net of the shack and estimate the dimensions. **(2)**
3. Calculate the surface area of the shack. **(3)**
4. Make a list of the materials you will need to build the Snack Shack. Use flyers from local lumber stores to determine the cost of the materials you will need. **(2)**
5. Build a 3-D model of the Snack Shack using paper or cardboard. Include the scale for your model. **(5)**
6. Calculate the volume of the interior of the Snack Shack. **(3)**
7. Change the height of the cylinder in your design. **(2)**
8. Calculate the new volume. **(3)**
9. Estimate how much of the volume will be taken up by the cooking equipment, cash box, sink, and/or cupboards for storage. **(2)**
10. Draw a diagram of the interior of the Snack Shack. Show how you decided to divide the space. **(3)**
11. Use words with the diagram to explain your choices. **(2)**
12. Change one or more of the dimensions of your design. **(2)**
13. Calculate the new surface area and volume. **(3)**
14. Share the results with a classmate. How did changing the dimensions affect the space inside the Snack Shack? **(2)**
15. Discuss the pros and cons of the new design. **(3)**
16. Choose a final design and prepare a report including diagrams, charts, costs, and a scale model of the Snack Shack to share with the parent council. **(10)**

**Evaluation:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Category** | **Level 4** | **Level 3** | **Level 2** | **Level 1** | **%** |
| Depth of Understanding | Demonstrates thorough understanding of concepts. | Demonstrates considerable understanding of concepts. |  |  | 20 |
| Problem Solving / Thinking | Use of procedure includes almost no errors or omissions. | Use of procedures is mostly correct, but there may be a few minor errors and / or omissions. |  |  | 20 |
| Application of Learning | Demonstrates sophisticated ability to make connections between mathematics learning and the real world. | Demonstrates considerable ability to make connections between mathematics learning and the real world. |  |  | 20 |
| Explanation and Justification of Concepts, Procedures, and Problem Solving | Provides thorough, clear and insightful explanations / justifications, using a range of words, pictures, symbols, and / or numbers. | Provides complete, clear and logical explanations / justifications, using appropriate words, pictures, symbols, and / or numbers. |  |  | 20 |
| Use of Mathematical Vocabulary | Uses a broad range of mathematical vocabulary to communicate clearly and precisely. | Uses mathematical vocabulary with considerable clarity and precision. |  |  | 20 |