Keeping the Kandies

MAP4CI

Name : _____ Due Date: _____ Write complete solutions in the space provided. Draw well-labeled diagrams, using a ruler. Show all calculations and write concluding statements. Be neat. Round final answers to 2 decimal places, unless otherwise stated. Your project is due the end of the class before your unit test.

You must do all work on the project in class - the assignment does not leave the room.

You are applying for a job with The N & N Kandy Company's packaging department. As part of the application process the company has requested that you prepare a report suggesting possible packaging alternatives for their candies. The company has indicated that the package must contain 500 candies, each having a volume of 0.4cm³. In addition to the size, the material cost is a consideration for the department.

What is the necessary volume of each package of candies?

Part 1 – Containing the Candies

You are told that the package will either be a *rectangular prism*, a *right isosceles triangular prism* or a *cylinder*. You must design one container for the 500 candies for each of these 3-D shapes. Your design must include a 3-D sketch labelled with the appropriate dimensions, the volume calculation to verify the package is the correct size and the surface area calculation.

<u>Notes:</u> The material for the packaging costs $0.0005/\text{cm}^2$. All costs must be rounded to the nearest tenth of a cent.

Rectangular Prism

3-D Sketch	Volume Calculation
	Surface Area Calculation
Cost:	

Keeping the Kandies (continued)



Right Isosceles Triangular Prism

3-D Sketch	Volume Calculation
	Surface Area Calculation
Cost:	

Cylinder

3-D Sketch	Volume Calculation
Cost:	Surface Area Calculation

Keeping the Kandies (continued)



Part 2

Steps for the Rectangular prism and the Cylinder

- 1. Find the dimensions that will minimize the surface area of the package that the company requires for its candies.
- 2. Determine the cost of the material that produces one package.
- 3. Draw a 3-D sketch of this package design.

Rectangular Prism

Hint: What is special about the rectangular prism that minimizes surface area?

Calculation of dimensions for OPTIMAL	3-D Sketch
rectangular prism	
	Cost:
	0001.

Cylinder

Hint: What is special about the cylinder that minimizes surface area?

Calculation of dimensions for OPTIMAL cylinder	3-D Sketch
	Cost:

Keeping the Kandies (continued)



The company was impressed with your first submission, and would like you to further investigate packaging solutions for the candies.

Part 3 – Keeping The Material Costs Low

The N&N Kandy Company would now like you to choose either a cylinder or rectangular based prism as a shape for their container. The container you choose should be both aesthetically pleasing and also keep the material costs low. Your choice must be justified, so your report must include calculations for the optimal surface area of all shapes.

Once you have completed all calculations, give your recommendation for which shape the company should use for the new N&N Kandy's package and its dimensions. Remember to justify your choice and include a diagram.

Report

Keeping the Kandies: Evaluation Rubric

Part 1

Category: Knowledge

Processes	Criteria	Level 1	Level 2	Level 3	Level 4
Exploring and	Collection of	Creates a	Creates a	Creates a	Creates a
Reflecting	data and	model that is	model that is	model that is	model that is
_	exploration of	connected to	appropriate	appropriate	appropriate
	the problem	the problem,	and connected	and connected	and connected
		yet	to the problem,	to the problem,	to the problem,
		inappropriate	yet missing	meeting all	meeting all
		for the inquiry	some	requirements	requirements,
			requirements		with a high
					degree of
					accuracy

Part 2

Category: Application

Processes	Criteria	Level 1	Level 2	Level 3	Level 4
Connecting	Make	Makes weak	Makes simple	Makes	Makes strong
	connections	connections	connections	appropriate	connections
(rectangular prism	among			connections	
and cylinder)	mathematical				
	concepts and				
	procedures				
	discussed				
	throughout the				
	unit				