



CORE Assessment Module Module Overview

Content Area	Mathematics
Title	Yum Yum Cereal
Grade Level	Grade 7
Problem Type	Performance Task
Standards for Mathematical Practice	<p>Mathematical Practice 1 (MP1): Make sense of problems and persevere in solving them. Mathematically proficient students:</p> <ul style="list-style-type: none"> • Explain to themselves the meaning of a problem and look for entry points to its solution. • Analyze givens, constraints, relationships, and goals. • Make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution. • Consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solutions. • Monitor and evaluate their progress and change course if necessary. • Transform algebraic expressions or change the viewing window on their graphing calculator to get information. • Explain correspondences between equations, verbal descriptions, tables, and graphs. • Draw diagrams of important features and relationships, graph data, and search for regularity or trends. • Use concrete objects or pictures to help conceptualize and solve a problem. • Check their answers to problems using a different method. • Ask themselves, “Does this make sense?” <p>Understand the approaches of others to solving complex problems and identify correspondences between approaches.</p>
Common Core State Standards	<ul style="list-style-type: none"> • 7.G.6 Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of quadrilaterals, polygons, cubes and rectangular prisms.
SBAC Assessment Claims	<p>Claim 1: Concepts and Procedures—Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency..</p> <p>Claim 2: Problem Solving—Students can solve a range of complex well-posed problems in pure and applied mathematics, making productive use of knowledge and problem solving strategies.</p>
Task Overview	Students will be asked to solve some constructed response questions involving area of 2-dimensional figures in Part 1 of the task. In Part 2, students will solve for surface area and volume of 3-dimensional figures. The performance task requires students to design a cereal box that is cost efficient and space saving.
Module Components	1) Scoring Guide 2) Task

Yum Yum Cereal Scoring Guide

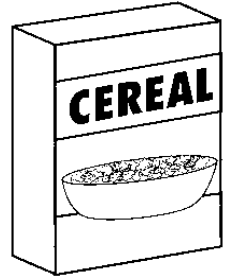
Part	Description Credit for specific aspects of performance should be given as follows:	Points	Total Points
1	1. Student gives correct answer: 508 cm^2 . Work shown may include correct process, but incorrect arithmetic: <ul style="list-style-type: none"> • Arithmetic error when multiplying the dimensions • Arithmetic error when adding up the area of the faces • Student added up only 3 of the 6 faces 	2	2
	2. Student gives correct answer: 616 cm^3 Student explanation could include: “I multiplied $4 \times 11 \times 14$ ” or “I multiplied $L \times W \times H$.”	1 1	2
	3. Student shows three solutions with diagrams, which could include the following: $1 \times 1 \times 240$, $1 \times 2 \times 120$, $1 \times 4 \times 60$, $1 \times 10 \times 24$, $10 \times 4 \times 6$, $4 \times 12 \times 5$, $3 \times 4 \times 20$, $2 \times 3 \times 40$, $2 \times 2 \times 60$	3	3
	Correct units used in all Part 2 solutions	1	1
2	4. Student lists two solutions: <ul style="list-style-type: none"> • $10 \times 10 \times 40$, $20 \times 20 \times 10$, $8 \times 10 \times 50$, $10 \times 16 \times 25$ Student provides two labeled diagrams Student shows work verifying the volume of the boxes	2 2 2	6
	5. Students calculates two solutions for the surface area. Work shown may include correct process, but incorrect arithmetic: <ul style="list-style-type: none"> • Arithmetic error when multiplying the dimensions • Arithmetic error when adding up the area of the faces • Student adds up only 3 of the 6 faces Give 3 pt for each correct solution	3–6	6
Part	Description Credit for specific aspects of performance should be given as follows:	Points	Total Points
	6. Student calculates two solutions for the cost per cm^2 . Student solution should contain the surface area for each figure multiplied by $\$0.0002$	2	2
	7. Response should be yes or no to one or both boxes, with reasons. Response should compare the dimensions of the proposed boxes to the size of the shelves. Response should include the following “look-for” phrases: <ul style="list-style-type: none"> • The box height must be less than 40 cm. • You could only fit one box deep with a width of 15 cm or more. • Cereal is usually stacked several boxes deep so use a smaller width. • The length of the box should be a factor of 600 to fit evenly on the shelves. Give 1 pt for a limited response; 2 pt if the student considered two dimensions; and 3 pt for a complete response	3 1–3	6

3	8. Student flier should include: <ul style="list-style-type: none"> • a drawing of the box with the dimensions labeled • the volume and surface area calculations • the cost of the box • two reasonable justifications for their design choice • units in calculations 	1 2 1 2 1	7
TOTAL POINTS: (possible points = 35 points)			

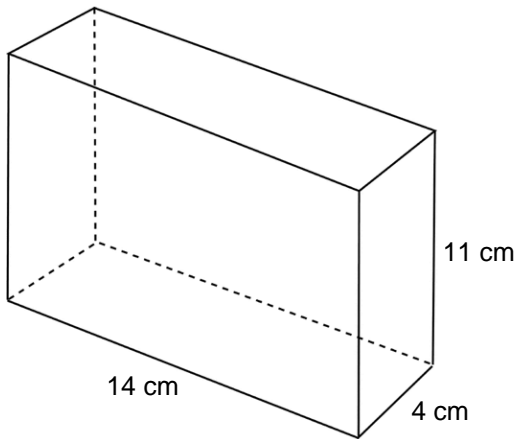
Yum Yum Cereal

Part 1

Congratulations on being hired as the new design engineer for Yum Yum Cereal Company. You are excited to use all of your expertise to make your new boss proud.



1. Find the total surface area of the rectangular prism. Show your work, step by step.



SA = _____

2. Find the volume of the rectangular prism above. Explain your steps.

V = _____

3. If the volume of a rectangular prism is 240 cm^3 , what could be the dimensions? Draw and label diagrams showing at least three possible rectangular prisms with this volume.

Part 2

Yum Yum Cereal Company just got a huge contract with Super Size Mart. Since you were just hired at Yum Yum Cereal Company, you get to design the next cereal box. The new cereal box must have a volume of 4000 cm^3 .

Your task will be to create a flier that contains your proposal for the best cereal box design for the cereal that Yum Yum will sell to Super Size Mart. Answer the following questions to complete this task.

4. Create two different-sized cereal boxes that would hold a volume of 4000 cm^3 of cereal. Draw each box below and label its dimensions. Show your work to verify that the boxes you drew would hold 4000 cm^3 of cereal.

5. Find the surface area of each box you created. Show all your work.

6. It costs $\$0.0002$ per cm^2 for the cardboard used to make the boxes. How much will it cost to produce each box you created in question 9?

Student Name _____

7. The shelves at Super Size Mart are each 30 cm wide, 40 cm high, and 600 cm long. There are 4 shelves in each unit. Based on this information, would you recommend producing either of the boxes you designed to hold the Yum Yum cereal? Explain your reasoning.

Part 3

8. Based on your work in questions 4 through 7, recommend the best size of cereal box for Yum Yum Cereal Company to sell at Super Size Mart. You can use one of the boxes you already designed or come up with a new one. Make sure the volume is 4000 cm^3 , that it is economical, and that it will fit on the shelves. To share your recommendation, create a flier that includes this information:

- a sketch of the box with the dimensions labeled,
- calculations showing the volume and surface area,
- the cost to produce a box of this size, and
- at least two different reasons why you chose this size box.

Organize your work neatly and creatively so that your new boss will be impressed.