

1.2 Optimal Containers I

Finding Surface Area

A toy company is planning to market a Wump Family and Imposter Characters collector set. Each character will be sold separately. The Mug Wump character comes in a cube-shaped package with 1-inch edges.

The toy company has to ship packages of the Mug Wump characters to many different toy stores. It plans to ship in large boxes, each holding 24 of the cube-shaped packages.



What are the dimensions of a box that will hold 24 of the cube-shaped packages and be least expensive to make?

Problem 1.2

- A** Find all the ways that 24 unit cubes can be packed in a rectangular prism. Sketch each possibility. Record the dimensions, volume, surface area, and sketches in a table like this:

Possible Arrangements of 24 Cubes

Length (in.)	Width (in.)	Height (in.)	Volume (in. ³)	Surface Area (in. ²)	Sketch
■	■	■	■	■	■
■	■	■	■	■	■
■	■	■	■	■	■

- B** Which arrangement of cubes requires the box that can be made with the least material? Which requires the box that needs the most material?
- C** Which box shape would you recommend for shipping the Mug Wump characters? Explain your reasoning.
- D** Why do you think the shipping directions called for 24, rather than 26, Mug Wump characters in a box?

ACE Homework starts on page 15.