

Name:

Math Olympiad Exploring! – Problem Due: – January 22, 2004

## = = Boxes With No Lid = =

If you pack 64 1-inch cubes together in a cardboard box with no lid, the box has size  $4 \times 4 \times 4$ . How many cubes don't touch the cardboard? In other words, how many cubes touch none of the sides nor the bottom of the box?

*(Hint: Draw a picture)*

Hard: If you have 60 1-inch cubes, how many ways are there to arrange the cubes into a rectangular box with no lid? Which one of these boxes has the least number of cubes touching the cardboard?