

SCIENTIFIC SKILLS EXERCISE:**Using a Scale Bar to Calculate Volume and Surface Area of a Cell**

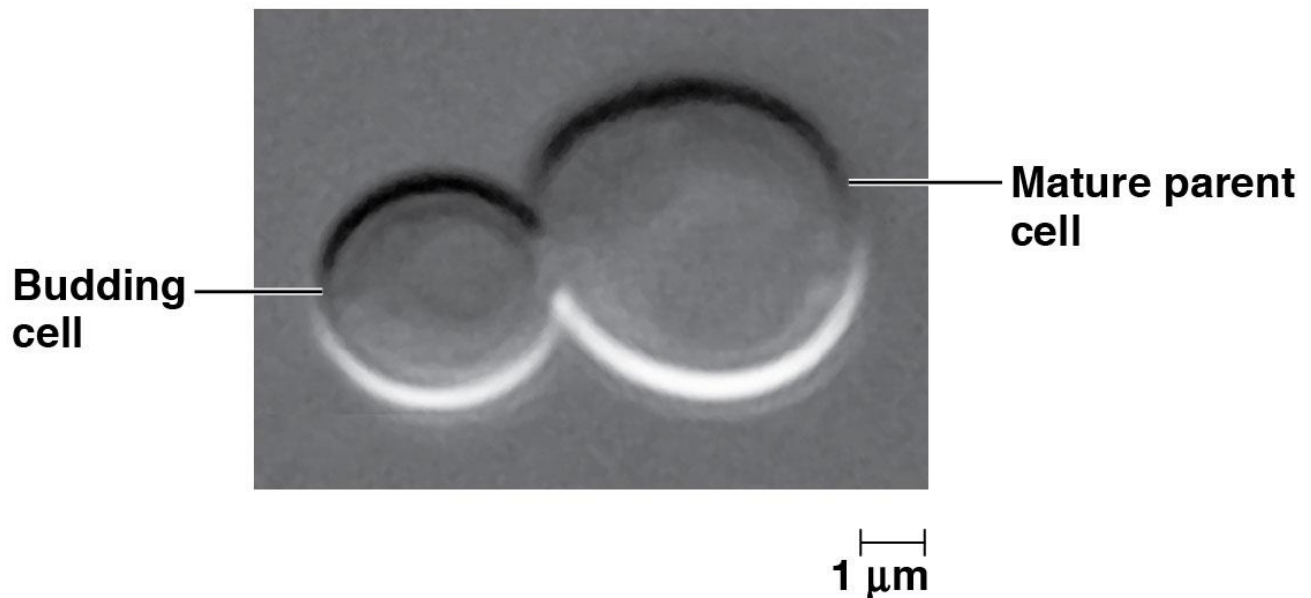
How much new cytoplasm and plasma membrane are made by a growing yeast cell?

Background: The unicellular yeast *Saccharomyces cerevisiae* divides by budding off a small new cell that then grows to full size (see Diagram 4.7). During its growth, the new cell synthesizes new cytoplasm, which increases its volume, and new plasma membrane, which increases its surface area.

In this exercise, you will use a scale bar to determine the sizes of a mature parent yeast cell and a cell budding from it. You will then calculate the volume and surface area of each cell. You will use your calculations to determine how much cytoplasm and plasma membrane the new cell needs to synthesize to grow to full size.

Methodology: Yeast cells were grown under conditions that promoted division by budding. The cells were then viewed with a differential interference contrast light microscope and photographed.

Results: This light micrograph shows a budding yeast cell about to be released from the parent cell:



CHAPTER 4

A TOUR OF THE CELL