AP Biology Problems: Cells (SA & Volume)

1) Cells throughout the world have variable shapes and sizes. Because of this, and because structure is designed around function, certain shapes are optimal for certain processes.

Analyze the following cells (units not to scale), and determine the following:

Cell 1 (spherical) where the radius is 3 mm

Cell 2 (flat and rectangular) where the height is 0.5mm, length is 4mm, width is 2mm

A. What is the surface area to volume ratio of both cells? (\*See the AP Bio Formulas Sheet)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| How to calculate Surface Area? | Surface area  | How to calculate Volume? | Volume | Surface area to Volume Ratio |
| Cell 1  |  |  |  |  |
| Cell 2  |  |  |  |  |

B. Compare the ratios and explain why one cell would be more efficient than another (paragraph)

C. Provide 4 specific examples of ways organisms use SA: V ratio to survive.