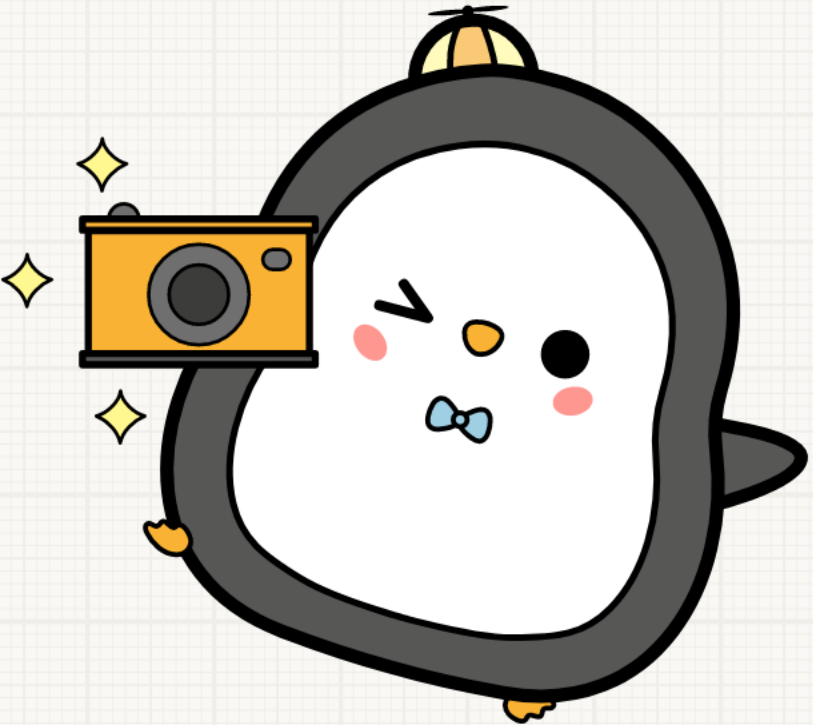
AP Bio Math Mondays

Surface Area: Volume Rectangular Solid

Surface Area and Volume

$$SA = 2lh + 2lw + 2wh$$



$$V = lwh$$

Rectangular Solid

Identification of Variables

Surface Area and Volume

$$SA = 2lh + 2lw + 2wh$$

$$V = lwh$$

Rectangular Solid

l = length h = height w = width

Math Monday #5

SA/V: R. Solid

Determine the surface area-to-volume ratio for a rectangular solid with length of 2 cm, height of 3 cm, and width of 4 cm.

$l = 2$ cm
$h = 3$ cm
$w = 4$ cm

Surface Area and Volume

$$SA = 2lh + 2lw + 2wh$$

$$V = lwh$$

Rectangular Solid

$$SA = 2(2)(3) + 2(2)(4) + 2(4)(3)$$

$$SA = 12 + 16 + 24$$

$$SA = 52$$

$$V = (2)(4)(3)$$

$$V = 24$$

$$\frac{SA}{V} = \frac{52}{24} = \frac{13}{6} = 2.17$$

Example Problem

SA/V: R. Solid

A block of phenolphthalein agar is placed in a vinegar solution. Solve for the SA/V ratio of the agar block (2 cm x 8 cm x 4 cm).

$l = 2$ cm
$h = 8$ cm
$w = 4$ cm

Surface Area and Volume

$$SA = 2lh + 2lw + 2wh$$

$$V = lwh$$

Rectangular Solid

$$SA = 2(2)(8) + 2(2)(4) + 2(4)(8)$$

$$SA = 32 + 16 + 64$$

$$SA = 112$$

$$V = (2)(4)(8)$$

$$V = 64$$

$$\frac{SA}{V} = \frac{112}{64} = \frac{14}{8} = 1.75$$

Which cell is more efficient?

SA/V = 2.17

SA/V = 1.75