**Calculating Surface Area to Volume Ratio**

**Surface Area** (SA) – area of material that it would take to completely cover an object

* *******Example* – the amount of wrapping paper it would take to wrap an expensive gift for Ms. Steffen. ☺
* Calculation for a cube-shaped object:

**SA = Length x Height x Number of Sides**

* For the cube pictured:

**SA = 3 cm x 3 cm x 6**

**SA = 54 cm2**

**Volume (V)** – the amount of space inside an object

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* *Example* – how much water would fit inside a bottle
* Calculation for a cube-shaped object:

**V = Length x Height x Depth**

* For the cube pictured:

**V = 3 cm x 3 cm x 3 cm**

**V = 27 cm3**

**Surface Area to Volume Ratio (SA:V)** – the proportion of amount of material covering an object to amount of material within the object.

* For the cube pictured:

**SA:V = 54:27**

* Simplify as much as possible so that V = 1. For the cube pictured, each side is divisible by 27.

**SA:V = 54:27**

**SA:V = 54/27: 27/27**

**SA:V = 2:1**

* What this tells you is that for *every 2 units of surface area covering the outside of the cube, there is 1 unit of volume in the inside of the cube.*

**Practice Problems**

For the four cubes below, ***measure*** the side of each cube (in cm) with a ruler. Then ***calculate*** the Surface Area, Volume, and Surface Area to Volume Ratio. Make sure to simplify the ratio so that Volume is = 1.

**Cube A:**

* Surface Area
* Volume
* SA:V

**Cube B:**

* Surface Area
* Volume
* SA:V

**Cube C:**

* Surface Area
* Volume
* SA:V

**Cube D:**

* Surface Area
* Volume
* SA:V

**Questions**

1. What pattern do you notice as the size of the “cells” increase?
2. Why is this important to living cells?
3. What can cells do to solve the problem?