**Limits to Cell Size Surface Area to Volume Ratio Questions**

**Answer the following questions in complete sentences for full credit.**

1. Describe three important materials organisms need to exchange efficiently with their surrounding environment?
2. What is the surface area to volume ratio for a cube with the following dimensions? Reduce your answers (Example 9:3 = 3:1)
   1. 3x3x3 cm cube
   2. 2x2x2 cm cube
   3. 1x1x1 cm cube
3. In relation to diffusion, why is surface area to volume ratio important for living organisms?
4. Which one of the three cubes in question 2 would be most efficient in exchanging material with its environment if the rate of diffusion were the same for each cube? Explain.
5. Describe three ways organisms can increase the surface area to volume ratio in their cells?
6. What are two biological “developments”, or adaptations in your body that help with the exchange of materials between your cells and the environment?
7. There is a large surface area to volume ratio difference between the size of an elephant and a squirrel. What adaptations do these animals have to solve water and heat loss from their bodies?

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**In your science notebook answer the following questions.**

**Do NOT turn in this assignment, it will be graded in class tomorrow.**

1. In a sentence describe three important materials organisms need to exchange efficiently with their surrounding environment?
2. What is the surface area to volume ratio for a cube with the following dimensions?
   1. 3x3x3 cm cube
   2. 2x2x2 cm cube
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5. Describe three ways organisms can increase the surface area to volume ratio in their cells?
6. What are two biological “developments” in your body that help with the exchange of materials between your cells and the environment?
7. There is a large surface area to volume ratio between the size of an elephant and a squirrel. What adaptations do these animals have to solve water and heat loss from their bodies?