**Quantitative Learning Goals**

Learning goals for General Biology 1 - Cell Structure and Function

Concept: Why are cells small?

(1) Knowledge and conceptual understanding

Students will be able to calculate the surface area and volume of hypothetical cells shaped like cubes.

(2) Thinking and other skills

Students will be able to graph the rate of change of the surface area and volume of the cells as they get bigger.

(3) Attitude and values

Students will be able to analyze the graph they produce to suggest an explanation of  "why cells are small?".

Modified (3) Attitudes and values

Students will interpret the graphical data generated by comparing the rate of change of surface area to that of volume. They will use their stated comparision to suggest an answer to the question of why cells are small. Students will then critique the answers genrated as a means of assessing the validity of thier answers.

Quantitative Reasoning Goal: Students should be able to use the graph generated to answer the question. Why are cells small? They should observe that the volume of the cells increase at a faster rate than the surface area. This observation will suggest to the students that this difference may be the reason that cells have to be small. Finally, the students will need to incorporate information learned earlier regarding the function of the cell membrane to control the movement of substances into and out of the cell and how this might affect/limit the ability of the cells to grow larger.