Laboratory 1
Scientific Method
Student Tip Sheet

You are beginning a study of biology that will allow you to explain many of the mysteries of life around you. After you have read the introduction to the lab manual and the text (you do always read all of the introductory material, don't you?), you will no doubt find mention of many topics, instructions, and techniques that will be illustrated and explained in the following chapters. It is only fitting that Chapter 1 begins this study of biology with an exercise illustrating the scientific method. You may or may not realize that the scientific method is not only for science students and researchers, but is really the only successful approach to problem solving in any arena, academic or otherwise. For example, if you plan to bake a cake, polish your shoes, write a story, or repair a small appliance you must move through several thought processes to accomplish your goal. Each of these tasks requires identifying the "problem," thinking through what might happen, gathering any necessary supplies needed, establishing a procedure, performing the task by gathering data, and evaluating your activity. Whether or not you realize it, those are the steps in the scientific method. Most texts and manuals begin with some form of problem solving using this method of identifying the problem and a possible solution, establishing methodical steps of investigation, recording results, and evaluating the process. There are many synonyms for the terminology, but the content is generally the same. Know that this method work…so use it!

A helpful point to mention in a scientific investigation is to always quantify the results of your tests. For example, terminology such as "more," "faster," "heavier," or "longer" should not be used. These subjective comparisons should be eliminated and specific measurements should be made in numerical counts, metric measurements of volume, mass, distance, time, or degrees of Celsius temperature. Always do your best to quantify your data.

Another point in writing scientific investigations is to use the Latin singular and plural terminology and spellings correctly. The plural form, "data are," and the singular form, "datum is," are commonly used incorrectly. The "aquarium is..." or the "aquaria are…" is another correct spelling that is often misused. If you are unsure of the correct grammar or spelling, always confirm with your instructor or a good dictionary. Make a habit of doing your best!

The specific experiment that you are asked to perform in Chapter 1 is to measure the movement of a garden snail under various conditions. Begin this and every exercise in this manual by reading the complete instructions before you arrive for class. Know in general what you are expected to do before you arrive, so that when your teacher gives you specific instructions you will not feel lost and not know where to begin. Much time and frustration will be avoided by thorough preparation.

Proper Planning Prevents Poor Performance

Nowhere is this more truthful than in biology lab. Read ahead, ask questions, and enjoy your investigations.