Learning science is something students do, not something that is done to them." (National Research Council, 1996). Many of the most popular middle and high school biology curricula have precious few opportunities for students to inquire. The bulk of the remaining curricula that do have activities have the activities (primarily lab and field investigations) after rather than before the corresponding textual reading. This means that, even if they attempt to provide engaging activities, the majority of biology and life sciences curricula from middle school through college do so by using an instructional strategy that is exactly opposite to the most natural way of learning. Such “text-driven” curricula have textual discussions of concepts prior to students doing investigations of those respective concepts. Little effort is made to connect the concepts to the students’ lives or previous knowledge. Wivaag (2001) points out that this sequence is entirely backwards. In fact, some well-known biology curricula have no activities until the end of the chapter! Ironically, this sequence is also contrary to what the research on learning suggests is most productive. These widely used biology curricula are typically large in bulk, filled with hundreds of new vocabulary words, and tend to encourage much teacher lecture. Unfortunately inquiry activities are seldom or nonexistent. Only a few biology curricula have many opportunities for relevant student inquiry and have placed these concrete activities before any corresponding reading material, vocabulary words, discussion, or opportunity for teacher lecture.

There are several other reasons why a lack of student inquiry, particularly at the beginning of instruction in new concepts, is a serious problem. One problem is that this type of instruction does not model scientific inquiry. Bruce Alberts, the President of the National Academy of Sciences, pointed out “In this approach — which remains depressingly common today — teachers provide their students with sets of science facts and with technical words to describe those facts.” (National Research Council, 2000).

In contrast, real-world scientific inquiry almost always begins with a question, problem, or puzzle that the researcher feels is interesting and relevant. This is followed by an investigation of possible solutions. Yes, some of the process includes reading relevant literature and communication with experts in the field. However, seldom does the literature or conversation alone answer the question. Systematic observation and experimentation are then done. Of course, there is a difference between scientific inquiry and inquiry instruction (Kyle, 1980). The main difference is that the students are not doing groundbreaking research; but the answers are not at that point known to the students, so it is authentic inquiry for them in this context. This procedure is also very motivating to the students because they feel that they are doing real scientific research. Even though the curriculum or the teacher may guide the student so that the learning is productive within the confines and time available in a classroom, the process of inquiry is maintained. To give the students