My son is taking biology this year. He is learning about observation through note taking, lectures, and answering questions at the end of the section review. I am not amused. No anoles are lapping water off the side of the enclosure for him to observe nor can he marvel as they grab at crickets to eat headfirst. No decaying logs are resting in aquaria for him to watch over the course of the school year as different pill bugs roll up and encircle a clump of wood. The classroom walls are barren of aquaria filled with schooling fish. No time is devoted to observing the plants that do not hang from the ceiling. Desert and bog terrariums are missing so observations about varying plant species and specific adaptations cannot be made. What’s my point? How can the essence of biology be taught if observation is not at the heart and foundation of everything we do? Even though Hooke had serious interpersonal issues, his take on observation was brilliant and we as biology teachers must take note:

*The truth is, the science of Nature has been already too long made only a work of the brain and the fancy. It is now high time that it should return to the plainness and soundness of observations on material and obvious things.*

—in Mackay, 1977, p. 76

From the beginning of the school year until the last day of class, our students need to be given time to observe living things from all phyla in order to develop the most important skill of the biologist. Throughout time, science has been built around observations, yet in many classrooms observations are sorely lacking. In college laboratories, there is little time devoted to strict observation, yet students often leave their labs early. Couldn’t those extra minutes be devoted to observations of organisms kept in the lab? Couldn’t the students be developing their sense of observation by making detailed sketches in their lab books? Must every lab be spent on a procedure and no time devoted to developing observational skills? Yes, I know, observation is a part of every laboratory procedure but I am talking about old-fashioned observation. You know, the kind of observation where a student sits patiently and observes an organism for 10-15 minutes at a time. The student watches and counts the organism’s respiration. Sketches its hind limbs. Describes its movement patterns. Uses a magnifying lens to sketch its scale pattern. Counts the flicks of its tongue. Describes the manner in which it consumes a cricket. How many bites? Headfirst? Body first? Eyes closed? Making time for observations provides our students with the chance to become experts at questioning, hypothesizing, and predicting because all of these flow from their observations (MacKenzie, 2001; Schmidt, 2000).

I realize it is the year 2005 and we are in the era of recombinant DNA, nanotechnology, and bioinformatics; however, if students are incapable of accurately observing in a thorough, insightful manner, will they be able to handle, comprehend, and ascertain what it is we want them to gain from the latest technologies we provide in our labs today? At the 2001 NABT Convention in Montreal, E.O. Wilson made a plea to all of us to get our students observing insects, to observing the tiniest of living things, to just observing again. And, in the words of J. Ziman, “the interpretation of familiar patterns as distinct entities is an integral part of the act of observation” (Ziman, 2000, p.121). Without a chance to uncover these patterns, many of the mysteries of life go unexamined. It is this mystery that seems missing from the biology classrooms and college labs today. As the French philosopher Bachelard said,

> A scientific observation is always a committed observation; it confirms or denies one’s preconceptions, one’s first ideas, one’s plan of observation; it shows by demonstration; it structures the phenomena; it transcends what is close at hand; it reconstructs the real after having reconstructed its representation.

—in Mackay, 1977, p. 11

When students observe, their existing cognitive knowledge and beliefs drive what they see (Driver & Bell, 1986). As Driver (1983) states, “Looking at is not a passive recording of an image like a photograph being reproduced by a camera” (p. 11). Instead, when students observe, a complex set of happenings is going on that is influenced by their theories, understandings, background knowledge, and experiences. They bring this complex set of influences with them to each and every observation.