As a teacher, I am a guide that leads students to discover knowledge.

**Approach to Teaching**

A principle theme defines my approach to teaching: fostering *discovery* in my students. As a teacher, one of my greatest pleasures is to watch students discover knowledge. Whether through running a scientific experiment, having thoughtful discussions with peers, or writing an essay, I desire students to be engaged in the process of discovery. Why is discovery so important? Three reasons: discovery thrills, discovery inspires, and discovery creates lasting memories, a combination that makes learning exiting, motivating, and enduring.

I remember as a high school student taking a class in physics. I learned about the independence of x and y trajectories, or put more simply, that horizontal motion is independent of vertical motion. As a budding scientist, I needed to test this principle. While in my mother’s car that afternoon, I removed a rock from my pocket, rolled down the car window, and let the rock fall. To my amazement, the rock – even though it was free from my hand – continued to move alongside the car for a short distance while at the same time falling due to gravity, until the air resistance finally slowed the rock and took it from my view. *Discovery thrills*. I remember a rush of feeling, of success and pride, when I saw that rock glide alongside the car. *Discovery inspires*. Immediately I began planning future experiments. Perhaps with a heavier object? Or an object of different dimensions? *Discovery creates lasting memories*. Over a decade has passed, yet this memory remains entrenched in my mind because of my excitement over the discovery.

This amateur experiment highlights what I want students to experience in my classroom: I desire for students to actively explore concepts and construct their own understanding. My belief is that this process makes learning exciting, generates momentum for continued learning, and creates knowledge that endures far into the future. Specifically, my goal is to encourage in my students an appreciation of ecology, evolution, and the scientific process through understanding of discipline-specific knowledge, application to real-life situations, and synthesis of knowledge across many disciplines, scientific and beyond. It is my hope that students, when going through this process of discovery, obtain a richer learning experience.

**A Scientific Basis for Teaching**

I am a scientist in almost all things I do, and naturally, it is my inclination to approach teaching from a scientific perspective. Doing *good* science is a professional and personal imperative, and likewise, practicing *good* teaching is equally critical to me. As a scientist, I have the scientific method to govern how to run experiments that yield rigorous conclusions. As a teacher, I have developed a method akin to the scientific method to guide my teaching (Figure 1).

I believe good teaching begins with observation and the formulation of questions about the intended audience. Who are the students? Why are they in this class? With what backgrounds will students approach course content? What are the critical concepts the students need to understand? From these observations, I form a hypothesis as to how to best teach the students. Perhaps an inquiry-based method is best, where students explore concepts using experiments.
they design themselves. Alternatively, discussion-, problem-, or technology-based teaching may be appropriate, depending on the situation. I then interactively teach the concept and assess student learning formatively during class with verbal and written feedback, in-class exercises and activities, and summatively through homework, tests, and reflective writing. I also assess learning through student questionnaires and informal conversations with students. Simply listening to the quality of student questions can also be a guide to my success as a teacher. Given this input, I revise my teaching to make it more successful in the future. In this manner, my teaching never stagnates; I constantly test my teaching, and adapt it based on student learning.

This scientific basis for teaching also relates directly to my interest in and approach to the scholarship of teaching and learning. I believe it is critical to test current teaching methods to determine their effectiveness, develop and test new teaching methods, and then disseminate research results to the teaching community. For example, I adapted, tested, assessed (through student questionnaires), and summarized (in a manuscript I intend to submit for publication) the use of a leadership philosophy for the teaching of discussion groups. My research indicated the application of the philosophy enhanced student discussion, and I strongly believe my participation in the scholarship of teaching and learning will benefit my future teaching.

Who am I as a Teacher?

I view the process of student learning as an awakening of knowledge in students; knowledge can almost be seen to come to life in students when teaching is effective. My role in this process is as a guide, helping students discover knowledge. I do not view students as cups into which I pour my knowledge; instead, I view students more as jigsaw puzzles, where the learning process involves connecting isolated pieces of information into a comprehensive unit. Students already have much of the fundamental knowledge (i.e. puzzle pieces) needed to solve complex problems. My role as a teacher is to help the students connect those bits of knowledge into a comprehensive understanding (i.e. the completed puzzle). As learning progresses, the puzzle becomes more complex and integrated, continually being enriched with the acquisition of new information.

As a guide in this process, it is my responsibility to ensure student learning occurs in a welcoming environment, in particular an environment respectful of diversity. In-class communication is essential to creating this environment. Communication fosters trust, which subsequently encourages students to think creatively and express their ideas. Conversation with and among students not only allows students to practice talking about scientific concepts (which
in turn is beneficial to retention of material), it also is one of the best ways to assess student learning during teaching (which allows me to adjust my teaching “on the fly”). Moreover, with open communication, a diversity of views can be brought into the discussion. Students form a kaleidoscope of diversity in the forms of gender, ethnicity, race, religion, learning style, communication style, as well as attitudinal diversity regarding desire for learning. This diversity must be respected in the classroom and, moreover, I aspire to include this diversity into teaching. In a diverse collaborative setting, diversity can lead to synergy, and learning can be enhanced for all involved.

Why I Teach

Teachers have extraordinary potential to make a difference in students’ lives and in their chosen field of study. I am passionate about teaching because of the opportunity teaching provides to positively affect students and to achieve a greater societal good through conservation of our natural resources. Teaching enriches my daily life and is a motivator for me to work harder, maintain ethical standards, and seek my highest potential as a scientist and human being. Through teaching, I endeavor to help students discover their own potential both scientifically and personally. Serving as a guide in this process of discovery is my greatest joy as a teacher.