

Statement of Teaching Philosophy- Katrina Hay

As a camp counselor, I lead my campers on weekly night hikes and star talks. Some campers were afraid of the dark, others excited; some didn't want to be cold, others didn't want to bring jackets. Having been a camper myself, I knew that whatever I taught them, they were likely to remember. I encouraged them to be respectful of each other's insecurities and to look out for one another. With no flashlights, I lead them to an opening in the trees where we gazed upwards, and discussed anything they wanted to know about the cosmos. I shared my knowledge of the scale of the universe and movements of celestial objects. I dispelled misconceptions about "falling stars". Inevitably, the hike was always exciting and the discussion insightful. They were glad they trusted my judgment and brought jackets. My campers left camp with pride in learning something they could explain to their parents and a newfound curiosity for the natural world.

This simple story reveals my teaching philosophy: to transform fear into confidence and promote curiosity and pride in learning. Leading students at a pace that they can succeed at and presenting intriguing real life connections to concepts can do this. Students will develop comfort and even excitement in encountering the unknown. This will allow them to be open to new concepts and become skeptical, determined, well-rounded scientists. Perhaps the most valuable skill physics can provide to anyone is not any one piece of knowledge, but the ability to look at a problem they've never seen before, dig down to the fundamentals and not give up until it is solved.

I chose Oregon State University for my graduate studies partly for their strong commitment to undergraduate physics education and training for students to become effective teachers. I am part of a mentor-teaching program that allows me to work with instructors and learn what goes on behind the scenes in a physics course. I'm currently mentor-teaching a large introductory physics class. Observing the instructor's preparation and presentation as well as student response has furthered my understanding of the delicate process of teaching. As part of the program, I give some of the class lectures. Students say they like my clear explanations and interactive style. I save room for interesting side topics. I help students distinguish general concepts from specific problems by asking them to identify the assumptions in an equation and in their problems. I try to keep a comfortable yet rigorous pace and I am proud that even at the end of my lectures students are still intently engaged. The experience of teaching is exhilarating for me. As their first assignment, I asked students to email me any question they had about the physical world. Curiosity, I believe, is vital in learning physics. The response was fantastic; I collected hundreds of wonderful uninhibited science questions that reveal so much about my students' interests and hobbies. Everything from guitar strings to String Theory (to see a complete list, visit "Curiosity Campaign" on my website: <http://oregonstate.edu/~hayk/index.html>). I am attempting to answer as many of these questions in class as is possible so that students can see the relevance of physics to many aspects of life.

It is a challenge to know what students comprehend during lecture. Here, in large classrooms students use a Personal Response System, which allows them to digitally respond to questions, giving the instructor immediate feedback. I have implemented this technique on a smaller scale with personal white boards as a teaching assistant for Paradigms in Physics, which was created at Oregon State University to restructure upper-level physics courses into concepts that broadly underlie their content. In this class, I learned that quick feedback, Socratic questioning and discussion in small groups, helps students learn material more fully. Creating a comfortable classroom supports this goal. I frequently begin courses that I teach by asking students to anticipate their trouble spots in order to help me prepare my lessons and to promote students' responsibility for what is taught.

An important goal for me is to become a professor that students can respect and trust. I am patient and I understand that learning can be frustrating. While subjects like art and music come easily to me, I'm not afraid to admit that I had to work hard to do well in my physics course work and I believe that I am a better teacher because of it. I don't take student learning for granted and I continue to learn how to better present the material as I teach.

I've taught a variety of recitations and laboratory courses ranging from physics, astronomy, soil physics and 6th grade rollercoaster physics, and been a part of groups focused on improving teaching methods, lab curriculum development and implementing a mentoring program for first-year TAs. I come from a long line of teachers and professors, who have passed on their passion for teaching to me. I watch my father, a national park ranger, share his love of nature and history to captivated strangers and my mother, a music teacher, give life-changing skills to children who have given up on school. My grandmother, a retired chemistry professor, instilled in me an enthusiasm for science. I enjoy passing on that enthusiasm to others, so I was delighted when a former camper told me that her experience during my star talk helped broaden her thinking and inspire her own passage into the sciences.