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Teaching Philosophy
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As a graduate student, I have the privilege of working in a field to which many members of the public feel drawn - astronomy. Many science and math fields are represented in pop culture today, and are present in students' everyday lives in an obvious and explicit way. As I make my transition from research to teaching, my broadest goal is to prove to students that they can interact with science as more than just passive observers. I want them to feel that they themselves can be scientists. Studies have shown that, somewhere between middle school and high school, many students simply lose interest in science and math. They start associating themselves with certain groups, and excluding themselves from others. Many do not see themselves as a "science person." I believe it is the duty of the science teacher to change their minds. I do not expect every one of my students to become scientists, but I do want every one of them to see science as a viable option for their future.

What do my students need in order to see themselves as scientists? First, they need self-confidence. I know from first-hand experience the role that so-called "imposter syndrome" can play in a student's career. In order to combat this issue, I aim to create a positive learning environment in my classroom – one where students do not feel afraid to offer answers to questions, or to ask questions that they might think are trivial. In my experience, the classrooms that achieve this goal are the ones in which the students see each other as collaborators, and not competitors. This can be achieved by encouraging discussion, having students work in groups early and often, and promoting collaboration on graded assignments. Working in groups (and varying assigned group roles) will also ensure that my students build valuable leadership skills. While I want my students to be able to build up their self-confidence, their assignments will not be easy. I plan to assign challenging, context-rich problems with connections to real-world scenarios.

Besides self-confidence, my students will also need to be able to perform well on graded assignments and external exams. To accomplish this goal, I will need to provide my students with multiple low-stakes opportunities to practice solving problems, such as ungraded assignments, or low point value quizzes in class. I will also need to tailor my teaching style to the needs of my students. I like to provide my students with multiple "entry points" for learning. I try to vary my teaching styles throughout a lecture or course by including short videos, multiple choice questions, interactive activities, physical demonstrations, worksheets, group projects, and oral presentations. I also rely heavily on metaphors and analogies to help get my point across, and will often make my own animations/videos to engage the students in discussion and debate.

One of my main goals as a teacher is to make sure that my students learn to think like scientists. In order to achieve this goal, I encourage my students to be skeptics. I

want them to demand evidence for claims, and to engage in debate when appropriate. While acting as the instructor of record for a *Life in the Universe* class at UCLA, I asked my students to participate in a class-wide debate at the end of the year. The assignment was to vote as a class on a proposal to spend $100 million to fund the Search for ExtraTerrestrial Intelligence (SETI) for 10 years. They were assigned roles ahead of time, such as radio astronomers, SETI scientists, astrobiologists, and taxpayers. During a class period, they worked in groups to research their assigned roles, and to develop an argument for or against the proposal using what they had learned in class. Some of the people in the class were "potential donors," and as such were not given a specific role. Their job was to be skeptical, and to make sure that any potential concerns were addressed by both sides. In the end, my students outperformed my expectations. Even the non-science majors in the class took on the role of scientists with conviction, confidence, and enthusiasm. Some students brought up arguments that had not even been covered in class. I ended up repeating this assignment in a class in the following quarter with similar results. This assignment confirmed for me the strength of role-playing and debate in a science classroom.

Students also need to realize how relevant science is to their everyday lives. I want them to understand that science does not just happen in a vacuum, but is crucial in solving the world's most important problems. As members of an increasingly global community, I would encourage my students to connect with local community leaders by organizing field trips, inviting guest speakers, and setting up partnerships between professional scientists and my students. I have experienced the other side of such partnerships as a graduate student and outreach coordinator at UCLA. I have seen how beneficial the connections between scientists and students can be, for all parties involved. I would take full advantage of the ability to connect my students to local and global scientists and community leaders using social media and various educational technologies.

Even if my students do not become scientists in the long term, I want them to leave my classroom with an interest in science. I hope that their science classes will be the classes they look forward to, not ones that they dread. The best scientists are the ones who can leverage their own curiosity and creativity to solve problems, even though most students believe that science is a stagnant, rigid subject. My goal is to change their attitudes toward science by connecting science and math concepts to their everyday lives, and to show them that everyone has a role to play in the advancement of science and technology in today's world.