Teaching Philosophy Statement

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I have three goals for students I guide through our molecular universe: to develop problem solving and communication skills, to connect content to important applications, and to develop a growth mindset. Developing my own growth mindset is an ongoing project that has served my life holistically. Here I have described the methods I use to achieve and assess these goals.

Problem solving and communication: Guiding students to apply core chemistry concepts and communicate solutions to complex problems are natural goals of a chemistry course. I structure class periods around short milestone lectures, surrounded with reflection questions and example problems to solve in pairs. Some pairs informally present their work to instruct the rest of the class. The assessment of in-class solution presentations is focused on honest participation, whereas homework assessment focuses more on content. I will also use the in-class activities and presentations to assess my instruction: if the presenter and class are confused, perhaps my warm-up lecture could be more effective. To develop writing skills, I ask students to write responses to conceptual questions in writing and then reflect after giving and receiving feedback. The lab portion of the course provides another important place to develop clear, technical writing. In addition to lab reports, assigning brief readings in current research on hot topics, like artificial intelligence in chemistry, will show students the central role of writing and reading scientific literature.

Connections: Since chemistry is central to many disciplines, it is both important and straightforward to help students create connections between the core content in a chemistry course and various aspects of modern society. For example, I can briefly connect the types of intermolecular interactions to my research in drug design. In a previous class, I assigned mini research projects, where finding applications came naturally as the project aligned with their interests. I plan to integrate discussions of ongoing research and key topics of great social importance, e.g. pesticides, nuclear energy, and medicine. Unjust social structures like sexism, racism and homophobia also directly affect science. To address this issue, I will connect core topics to research done by people with a diversity of backgrounds, such as the women who pioneered crystallography in a lesson on chemical structures.

Growth mindset: Learning is all about growth rather than grades, yet it can be easy to identify students with fixed attitudes about themselves: “I am not a math person,” or “I suck at chemistry.” For example, while giving an in-class presentation, a student who realizes they don’t understand as well as they thought should be encouraged to view challenges as inherent to the learning process. Many students I have encountered appreciate the need for challenge in physical fitness yet are impatient with themselves in intellectual settings. To address this, I give students opportunities to resubmit homework problems for partial credit after an honest but imperfect attempt. The goal is to refocus homework on practice, but it also makes the class inclusive. One student with medical needs was accommodated with the flexibility of resubmission. Another student who really struggled with math was greatly relieved to turn in their first attempt, once they had worked for X amount of time, and try again later. I will use small reflection writing assignments to assess their progress in developing growth mindsets.

I am excited to devote my life to helping my students develop versatile skills I’ve described and watching them solve real problems in society. I believe the growth mindset is particularly important because it can enable a person to enjoy a resilient, fulfilling life with or without chemistry.