My educational philosophy has been shaped by experience teaching at several levels. I have presented instructional sections, interactive laboratory sessions, discussion sections, and one-on-one tutoring for college students in a wide range of majors. My contributions to secondary education have included one-on-one tutoring and facilitation of group projects in the high-school classroom. I've also been active in promoting extracurricular learning as an instructor in summer and weekend programs for gifted youth. It has been my good fortune and a pleasure to have opportunities to teach mathematically inclined students under these varied circumstances, but I find the most challenging and rewarding experiences I've had to be those in which I work with students who are not passionate about mathematics.

Teaching is a skill that can only be developed through practice, and while it is a challenge in itself to keep those who are driven in mathematics challenged and focused, I find greater purpose in bringing mathematical thought to those who were not previously inclined to study mathematics. One of my priorities, in presenting mathematics to non-mathematicians, is making it seem alive, relevant, and, if at all possible, beautiful. Mathematics is more than a toolbox for the sciences, but is a mode of thought and an approach to every human experience. One of the features of mathematics education I try best to keep in mind is *contextualization*: what aspect of mathematics is it more effective to present to students, and how can it be framed within the realm of their experience? Many of my most interesting challenges deal with students who have internalized the notion that mathematics is a perverse self-contained exercise, having no relevance to anything but itself. It's important that a student's experience of mathematics be grounded in the familiar: this concept includes but is not limited to the familiar approach of applications-based teaching.

I find one of the most important practical considerations in presenting mathematics in a relevant context is choosing an appropriate context for the students' needs and interests. For some classes, contextualization in applications is less effective than a contextualization in philosophy or aesthetics. The diverse perspectives on mathematics must be managed carefully in a classroom: it is tempting to try to make the course material seem relevant to everything, but this too easily makes it seem relevant to nothing instead. Instead the approach must be tailored towards the most appropriate contextualization for both the subject-material and the audience: working with engineering and science students in college, I have found applications-based approaches most effective; liberal-arts and mathematics students find the elegance of symmetries and satisfactory arguments appealing; and for high-school students I have generally focused on a historical grounding, especially in calculus, where assessment of the historical approaches to the concepts of the infinite and infinitesimal gives students a better idea of why and how the tools they learn were developed. My fundamental thesis, regardless of the course I'm teaching, is that any material can be made interesting and engaging. There is no field of mathematics which does not relate closely to extraordinary historical developments, unusual and intriguing applications, or philosophically challenging concepts.

Another important tool in the development of mathematical comprehension is the fostering of communication. Working in a teaching capacity shortly after my term as an undergraduate, it came as a surprise to me to learn how incomplete my own knowledge was, and that I only reached full understanding when it became necessary for me to explain concepts. Whenever possible, I challenge my students to explain their reasoning, exercising not only

their internalization of the course materials, but also their communications skills and powers of logical reasoning. Regardless of students' future studies, the ability to craft logical rhetoric will serve them well, and mathematics is an excellent venue in which to develop these skills.

These innovative approaches, however engaging they may be for the students, must of course be balanced with the stated goals of the course and the department's expectation for graduates of the course. In fundamentals courses, much of this material is less engaging, involving, for instance, rote-work to inculcate methods, rather than concepts, upon the students. I rely primarily on two tricks to make this sort of work as engaging and straightforward for students as possible. First, I try to draw parallels between several problems of the same type. When presenting a general method, I try to work out at least two specific problems utilizing that method, so that points of similarity among all problems of a certain type are highlighted, and students need only fill in the gaps. My other priority when presenting a method which will be the subject of rote-work is an extension of my usual attitude: namely, an unflagging enthusiasm even when performing a fairly routine process. Almost all mathematical problems, even the most commonplace, have underlying them a clever trick, which I try to convey to the students. When time permits, I explicitly show off the underlying elegances that make a method work; even when pressed for time, I try to give at least a hint of the reasoning behind a rote method, and encourage interested students to follow up outside of class.

Under many circumstances, my best educational accomplishments have been outside the classroom. My classroom style provides a foundation to intrigue students and stimulate further questioning: what clever conceptual synthesis makes a method work, or a further interest in a context in which a method or concept is used. I follow up outside of the class on the interest I raise in lectures, so availability is a critical part of my educational strategy. I make sure my office hours are convenient, accessible, and welcoming, I maintain a visible presence on campus, and I try to allow students opportunities for investigation on their own time with reading suggestions, a modest lending library, and a collection of exploratory problems.

I strive, in all my interactions, not just those with students, to teach and to learn. My strategy, in exchanging knowledge, is simple: to ask and encourage questions, to seek out the beautiful and the interesting and encourage others to do likewise.