

TEACHING STATEMENT
NICHOLAS A. SEDLOCK
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Whenever I tell someone I study math, they tell me how they hated math in high school, or how badly they did in the subject. They think they are bad at math but the real problem is that they had boring math classes in high school, got to college, took the one or two math course they had to take, then never thought about math again, and certainly never thought it could be interesting on its own. I see a similar attitude from many of my students in my classes — I've had students tell me they hate math during my office hours, while I was teaching them. My job as a teacher is to overcome that attitude, and I can only do that by gaining the trust and respect of my students who have grown to dread math because of poor instruction in the past.

The most important thing I do as a teacher is to make myself approachable. I make sure my students know they can e-mail me anytime, make an appointment to see me when it's convenient for them, drop by my office hours, and interrupt me during class if they have a question. My students trust me and are willing to tell me what they don't get so I can explain it more closely, and so that my students leave my class understanding what I've talked about that day. My classes, even my larger ones, become discussions.

When I explain a new concept, or answer a question about an old one, I ask my students to walk me through steps that I've taught previously. This keeps the class engaged in the material and listening. It's also useful when I do a more complex example — by having my students do the work for me, they see that the harder problem can be done using the same tools as the easier problem. After I introduce a simple concept, I present a few increasingly complicated examples. This way my students learn to apply the basic concepts to more complicated problems on homework and tests.

When I teach I frequently stop and ask if there are questions. When I see a student who looks confused, I ask them what they don't understand. I then walk them step by step through what I just did, find what is confusing them, and explain that part in more detail or work through an example with them. If I need more time, or if they aren't comfortable talking about what they don't get in front of the rest of the class, I'll talk to them outside of class — in my office hours or at another time convenient for them — so that I can explain what they did wrong and how to fix it. I do this until my students can explain to me how to solve the problem in question, and then verify it with homework and tests. If a lot of people are struggling with something, I'll spend more time on it in class, rather than rushing through my syllabus. My students frequently say that this is helpful to them in person and in my course evaluations. When I taught a summer finite mathematics class for gifted high school seniors, one of my students struggled much more than the other students due to a learning disability. In class we often did problems in groups, and I would frequently stop by to see how he was doing. In addition, I met with him outside of class for an hour almost every day, just to clear up questions he had about the homework. I do whatever I can to make sure that students who are falling behind catch up.

I do a lot of evaluation to make sure my students understand the material in my classes. I give regular graded homework that covers both basic concepts and complex applications, and I encourage my students to work together, though I ask them to say who they worked with. This allows me to ask more challenging questions in the homework than I might on a test or quiz. If a student is having trouble on homework, I'll ask them to see me in my office so I can explain what they don't get. My in-class evaluation takes many forms. In my statistics class, I did a query at the

beginning of each class. I would randomly draw a couple of students' names, and I would ask them a simple conceptual question about the previous class's material. Because of this, my students took detailed notes and reviewed them before the next class. When I taught my precalculus class and my finite mathematics class, I gave weekly quizzes every Friday that covered the material from the previous week instead of tests, because the class met five days a week for five weeks and I needed more feedback quickly. This encouraged my students to think about material for longer than a few days, and allowed me to evaluate their understanding of the material when working alone.

All of this lets my students understand the material presented, which lets me show them interesting applications of the material, demonstrating the utility and beauty of mathematics. In my statistics class, on the first day I said we would learn enough to prove that Gregor Mendel probably fudged his data, and on the last day, that's what I did, applying everything we had learned that semester. Furthermore, over the course of the semester, there were several smaller "big ideas", such as how election polling works, or how you can design a survey to eliminate as much bias as possible. In my finite math class, there were three distinct units: one on number theory, one on probability and one on graph theory. In each case, I began by talking about an interesting application of the subject, and then ended the unit with a lecture on that application — in this case, RSA encryption, the Monty Hall problem, and multi-thread task sequencing. These overall goals provided structure and motivation for my students, and further engaged them in the material. This approach has been successful enough that students who told me they hated math on the first day of my statistics class went on to take a class in the regular statistics sequence, even though they had fulfilled the requirements of their major, because they were interested in the subject now because of my class, so I must be doing something right.