

What It Feels Like to Be Bad at Math

By Ben Orlin, from <http://mathwithbaddrawings.com/2013/04/25/were-all-bad-at-math-1-i-feel-stupid-too/>

As a math teacher, it's easy to get frustrated with struggling students. They miss class. They procrastinate. When you take away their calculators, they moan like children who've lost their teddy bears. (Admittedly, a trauma.)

Even worse is what they *don't* do. Ask questions. Take notes. Correct failing quizzes, even when promised that corrections will raise their scores. Don't they *care* that they're failing? Are they *trying* not to pass?

There are plenty of ways to diagnose such behavior. Chalk it up to sloth, disinterest, out-of-school distractions – surely those all play a role. But if you ask me, there's a more powerful and underlying cause.

Math makes people feel stupid. It hurts to feel stupid.

It's hard to realize this unless you've experienced it firsthand. Luckily, I have (although it didn't feel so lucky at the time). So here is my tale of mathematical failure. See if it sounds familiar.

Thanks to a childhood of absurd privilege, I entered college well-prepared. As a sophomore in the weed-out class for Yale math majors, I earned the high score on the final exam. After that, it seemed plausible to me that I'd never fail at anything mathematical.

But senior spring, I ran into Topology. A little like a bicycle running into a tree.

Topology had a seminar format, which meant that the students taught the class to each other. Twice during the semester, each of us would prepare a lecture, then assign and grade a homework assignment. By reputation, a pretty easy gig.





My failure began as most do: gradually, quietly. I took dutiful notes from my classmates' lectures, but felt only a hazy half-comprehension. While I could parrot back key phrases, I felt a sense of vagueness, a slight disconnect – I knew I was missing things, but didn't know quite what, and I clung to the idle hope that one good jolt might shake all the pieces into place.

But I didn't seek out that jolt. In fact, I never asked for help. (Too scared of looking stupid.) Instead, I just let it all slide by, watching without grasping, feeling those flickers of understanding begin to ebb, until I no longer wondered whether I was lost. Now I *knew* I was lost.

So I did what most students do. I leaned on a friend who understood things better than I did. I bullied my poor girlfriend (also in the class) into explaining the homework problems to me. I never replicated her work outright, but I didn't really learn it myself, either. I merely absorbed her explanations enough to write them up in my own words, a misty sort of comprehension that soon evaporated in the sun. (It was the Yale equivalent of my high school students' worst vice, copying homework. If you're reading this, guys: Don't do it!)

I blamed others for my ordeal. Why had my girlfriend tricked me into taking this nightmare class? (She hadn't.) Why did the professor just lurk in the back of the classroom, cackling at our incompetence, instead of *teaching* us? (He wasn't cackling. Lurking, maybe, but not cackling.) Why did it need to be stupid topology, instead of something fun? (Topology is beautiful, the mathematics of lava lamps and pottery wheels.) And, when other excuses failed, that final line of defense: I hate this class! I hate topology!

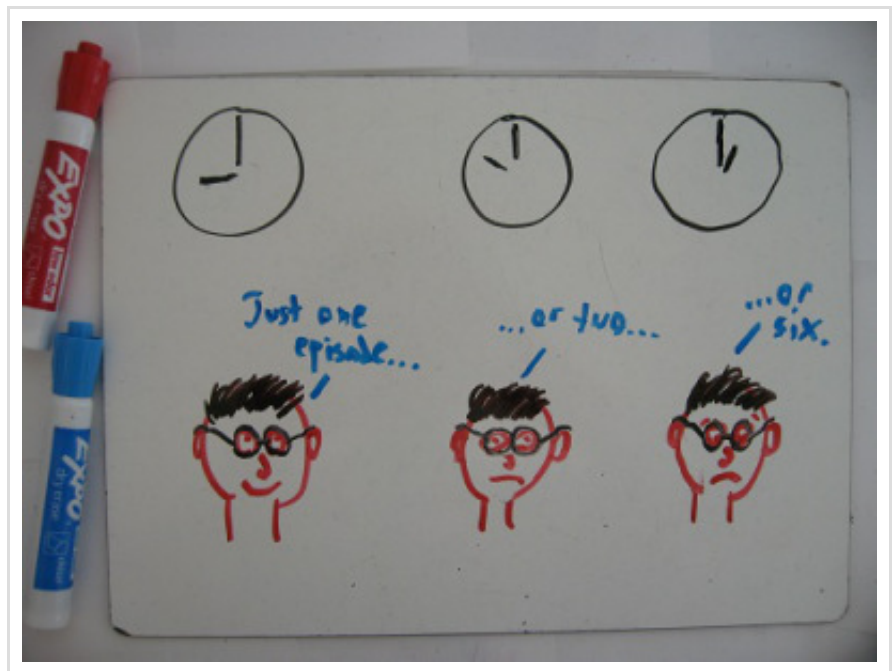
Sing it with me: "I hate math!"

My first turn as lecturer went fine, even though my understanding was paper-thin. But as we delved deeper into the material, I could see my second lecture approaching like a distant freight train. I felt like I was tied to the tracks. (Exactly how Algebra 1 students feel when asked to answer those word problems about trains.)

As I procrastinated, spending more time at dinner complaining about topology than in the library *doing*

topology, I realized that procrastination isn't just about laziness. It's about anxiety. To work on something you don't understand means facing your doubts and confusions head-on. Procrastination pushes back that painful confrontation.

As the day approached, I began to panic. I called my dad, a warm and gentle soul. It didn't help. I called my sister, a math educator who always lifts my spirits. It didn't help. Backed into a corner, I scheduled a meeting with the professor to throw myself at his mercy.



I was sweating in the elevator up to his office. The worst thing was that I admired him. Most world-class mathematicians view teaching undergraduates as a burdensome act of charity, like ladling soup for unbathed children. He was different: perceptive, hardworking, sincere. And here I was, knocking on his office door, striding in to tell him that I had come up short. An unbathed child asking for soup.

Teachers have such power. He could have crushed me if he wanted.

He didn't, of course. Once he recognized my infantile state, he spoon-fed me just enough ideas so that I could survive the lecture. I begged him not to ask me any tough questions during the presentation – in effect, asking him not to do his job – and with a sigh he agreed.

I made it through the lecture, graduated the next month, and buried the memory as quickly as I could.



Looking back, it's amazing what a perfect specimen I was. I manifested every symptom that I now see in my own students:

- Muddled half-comprehension.
- Fear of asking questions.
- Shyness about getting the teacher's help.
- Badgering a friend instead.
- Copying homework.
- Excuses; blaming others.
- Procrastination.
- Anxiety about public failure.
- Terror of the teacher's judgment.
- Feeling incurably stupid.
- Not wanting to admit any of it.

It's surprisingly hard to write about this, even now. Mathematical failure – much like romantic failure – leaves us raw and vulnerable. It demands excuses.

I tell my story to illustrate that failure isn't about a lack of "natural intelligence," whatever that is. Instead, failure is born from a messy combination of bad circumstances: high anxiety, low motivation, gaps in background knowledge. Most of all, we fail because, when the moment comes to confront our shortcomings and open ourselves up to teachers and peers, we panic and deploy our defenses instead. For the same reason that I pushed away Topology, struggling students push me away now.

Not understanding Topology doesn't make me stupid. It makes me bad at Topology. That's a difference worth remembering, whether you're a math prodigy, a struggling student, or a teacher holding your students' sense of self-worth in the palm of your hand. Failing at math ought to be like any failure, frustrating but ultimately instructive. In the end, I'm grateful for the experience. Just as therapists must undergo therapy as part of their training, no math teacher ought to set foot near human students until they've felt the sting of mathematical failure.