

# Seven Ways to Cultivate Joy and Empathy in Math Class

One educator shares tales of teaching life lessons to her students, alongside integrals and exponentials.

When we think about lessons in joy and [empathy](#), math class might not immediately spring to mind. But perhaps it should.

Science, technology, engineering, and math (STEM) education is often touted as key to our “staying competitive.” But when we look deeply at the challenges before us, we see what’s really needed is not more competition, but more cooperation—not just between people, but between our own hearts and minds. For the past two decades, I’ve been teaching rigorous college calculus in a holistic support program for underrepresented students.

After some years as a successful task master, I finally began taking “holistic” to heart, opening my classroom to studies not only in calculus but in joy and empathy, too. Early on, I worried about how this added layer would affect high-stakes test scores and the like. But this experiment revealed a most welcome discovery. Rather than competing, the two curricula—one for the mind and one for the heart—actually related symbiotically, inspiring triumphs in both realms that neither could have achieved alone.

Here are seven seeds for growing such a “whole flower” STEM classroom.

## **1. Frame the classroom as a community and ecosystem**

Math class might not engender connection as readily as a seminar in Sociology, but it’s still fertile ground for growing community. We just need to be proactive in planting those seeds.



On the first day of class, instead of reviewing attendance and cell phone policies, my students and I talk about creating community. The part about caring for each other—sharing everything from snacks to math tips to moral support—comes easily to them.

More challenging is to see that we're an ecosystem and the decisions we make as individuals have ripple effects that touch us all. For example, one day I find an 'A' student perched on the windowsill, texting, while her group stalls on a challenging problem. When I approach her, she says, "Don't worry. I'll be set for the test—a must if I'm gonna get into b-school and come out a social entrepreneur, ready to rock the world." "A social entrepreneur?" I say. "That's great! I have an internship for you, starting now. Help your peers with the math so they can realize their dreams as well."

She gets it and jumps right in. And it's not long before she stops texting in class, too, having found something more gratifying to do.

## **2. Broaden the mission**

In conventional business models, there's just one bottom line: profit. In today's test-centric culture, our classroom goals can easily be downsized to a single bottom line, too. But socially conscious enterprises adopt a more holistic measure of success—a triple bottom line of people, planet, and profit—and so can we.

In my classes, we embrace the three Gs: grades, growth, and greater good. This means we celebrate not only high exam scores but also the intellectual and personal growth that stems from grappling with a challenge like calculus, a growth that will serve us well whether we become engineers, poets, or diplomats. And if our journey takes on meaning beyond ourselves,

then we honor that achievement, too.

For instance, one day a struggling pre-med student tells me he's ready to throw in the towel. "Sure, I'm at the U," he says. "But why bother? The game is still rigged and our society is still racist."

But after we talk for a while, he finds a reason to bother in the image of another young man back at his inner city high school, sitting in a lab with no equipment, wondering if someone like him could ever be a doctor. And with that, this future doctor jumps back into the game—a game where the object is much more than just making As.

### 3. Let joy flow from the learning itself



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Math is a beautiful story, a feast for the mind. But once we reduce it to a series of rote computations, to "Once upon a time... the end," it's no longer very palatable.

Longing to see our drill-weary students smile again, we might try repackaging bland lessons as "Happy Meals." So maybe we bring pie for pi day (3/14), host math bingo, or the like. Of course, pi, pie, and bingo are all fine. (Our classroom game of choice is "Math Jeopardy!") But there's a deep well of

joy to be found in the math itself.

In my own classroom, sometimes this joy is sparked by a special project, like investigating patterns in nature at the local arboretum. But often, it happens in simple moments, like when I'm sharing a story about why both  $x^0$  and  $0!$  are equal to 1 and my students are so wowed that you'd think they were watching a math magic show. "Holy shit! (Oh sorry.) Eureka!" "Wait! I gotta write this down!" "Wow! Can I text my sister? I think she's learning this

now, too.”

When we think of privilege in education, we imagine nicer buildings, more computers, smaller classes, but it’s more than that. There is art. There is music. All students should have that. And perhaps all students should have a chance to experience the art and music in mathematics as well.

#### **4. Teach inclusively**

In the humanities, we know what it means to practice inclusivity. Celebrate diversity. Watch assumptions. Draw everyone into the conversation.

But inclusive practices have a place in math class, too. We just need to translate them to a context in which “integration” doesn’t invoke the Civil Rights Movement. As is often true, my students’ diversity also extends to math backgrounds, with experiences ranging from AP Calculus to a class called “Analysis” that, due to staffing issues, was actually a study hall. In an effort to reach everyone, I follow a few core practices.

First, I try to make lessons self-contained. So if we need to factor to solve differential equations, we start with a brief review.

Next, I mostly speak English, not math. For example, when introducing derivatives, I don’t talk about limits per se but about how an officer checks our speed on the highway.

Finally, I treat every question as a welcome question. I especially like to use so-called “silly” ones as springboards to deeper understanding. So when a timid student says, “I know I should know this, but what’s the volume of a cylinder?” rather than soliciting a dusty formula from high school geometry, I ask folks to think about stacking Oreos and, in a follow-up about surface area, onion rings. “Stop!” says my newly emboldened student. “What’s up?” I ask. “Another question?” “No,” she says, laughing. “This makes perfect sense. Thank you. But y’all are making me hungry!” —hungry for lunch and, I

hope, hungry for learning.

## **5. Cultivate spaciousness**

One day, a student walks into class and says, “I have a question for you. Why are white people in such a hurry?” The class bursts into knowing laughter. And although I think it’s an equal opportunity affliction, they’re right: our society is suffering from a rushing epidemic, fed in part by our “more is better” mentality.

After one particularly harrowing day, I decide it’s time to take a cue from the Slow Food movement and try something new: Slow School.

To start, I relax the rules—and just relax, period. So if a student walks into our two-hour class a few minutes late, instead of launching into my “Be on time” soliloquy, I just say, “Welcome!” and let them be. And when students start chatting during a group project, I take a few moments to appreciate the friendships blossoming organically across cultures before walking over to see if the math is going as well. As for lectures, I used to think, the more examples, the merrier. But now I use a “less is more” approach, so that we have time to enjoy and explore.

This has led to some amazing unscripted lessons, like the day we went off on a long (ha!) tangent about infinity, an impassioned conversation that followed my students right out the door. Tellingly, on the next quiz, this cohort outshined their peers who saw my whole scripted show, more examples and all.

## **6. Turn missteps into lessons**

Jim Henson once said, “Our kids don’t remember what we try to teach them. They remember who we are.”

So, a good start to teaching empathy is to be sure we embody it. This means if a student saunters in late, misses an assignment, or even steals a

glimpse at a neighbor's paper, we need an alternative to waxing Attila the Hun.

One strategy is to integrate such moments right into our lesson plans, transforming the classroom into a space for learning not only math but also student life skills such as how to budget time, how to back up an alarm clock, and how to cope with stress.

So if a student requests an extension on a big assignment, I say, "Okay, but how about including a plan for how you're going to navigate your next busy spell as well?" And when I catch a student peeking at a neighbor's quiz, I say, "Hey, come walk with me." We talk about pressure at school and home and not just *what* she wants to be when she grows up but *who*.

And the next time there's occasion to bend the rules, she instead writes me a note apologizing for being so behind. I'm not usually happy to see a blank paper, but in this case, I think my student learned something more valuable than math—and so did I.

## **7. Every so often, try a one-word lesson plan**

My favorite is "love." I've found it works well in other spaces, too.