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From Professional Musician to Professional Physicist: A Heartfelt Story for Every Teacher

Dear Teacher,

I am writing to share a short-but-powerful story and I thank you in advance for taking a few minutes out of your busy day to consider it. My hope is that it will create a bond for working together toward the goal of unlocking your students' full potential.

I may be the most unlikely physicist you could know! Although today I am a professor, a published scholar and head of a prestigious research center, for most of my school life, I strongly disliked anything connected with math and science! As I reached the 8th grade, most of my grades in algebra, geometry and physics were Cs (with frequent Ds and only the occasional B). By then, I had been playing the accordion for more than seven years, attended music classes almost daily, and had no doubt that I would become a professional musician.

At school, I always sat in a back row and created tons of trouble for my math and science teachers. But one day something changed my life forever. My physics teacher said, "If you measure the circumference of a circle and divide it by the circle's diameter you will always get the same number, which is 3.14……. A Pi number."

Luckily for me, the teacher was not only saying that sentence but demonstrated it.

He took several cardboard circles, measured the circumference and diameter of each, divided the two numbers and all the results were very close to the Pi number. This demonstration left me stunned. I could not believe that no matter how small or large the circle was, the result of dividing the circumference by the diameter resulted in the same number for all circles.

Upon coming home from school that day, I measured a variety of round objects in the house – frying pans, plates, rims of cups, etc. Sure enough, the results of the measurements

of the circumferences and diameters proved the first equation I ever understood:

C/D = 3.14…. (here C stands for the circumference of a circle and D stands for its diameter)

The next day, I went to the school library and started to look through math and science textbooks from earlier grades, trying to figure out which grade I could truly comprehend. I realized that I knew how to add, subtract, divide, multiply, and reduce fractions. But I also realized that, as an 8th grader, my knowledge of math and science was at an elementary-school level – another stunning revelation! I borrowed some 6th-grade level physics and math books, determined to learn their contents on my own. It took about seven months for me to get through the 6th and 7th grade physics curricula. By the time I started 9th grade, I had caught up to my classmates. In the process, I found what would become a lifelong passion.

I fell in love with the simplicity of physics and the elegance of the math language that allows physics to describe the world around us.

Fast forward to high-school commencement day: I graduated as the top student not only in my school but in the region, and was awarded a Gold Educational Medal. This opened the door to the university of my choice. I went on to become a physics teacher; earn a doctoral degree in math and physics; and to accept an invitation to teach and conduct research in several countries in Europe, Asia, and the United States, which has become my home. I also created a company called Physical Science Research Associates (Physcira) to bring world-class, innovative physics education to U.S. schools (and to make learning fun for students who might feel the way I once did about science and math).

The reason I have shared my story with you is this:

One hands-on lesson in physics completely changed the course of my life.

By using a hands-on curriculum, if you have all the tools and support to create the same kind of life-changing experience for your students, you can change their lives. Of course, not all your students will become scientists. But after experiencing hands-on physics, all of them will gain a deeper understanding of how the world works; will see real-world applications of mathematics; and all of them will remember you as a teacher who erased their fear of math and science, and who inspired them to look at our amazing world with different eyes.

Let us provide students with the opportunity to learn by doing simple experiments. Let us place their education in their hands. Let us enjoy seeing immense, transformative changes in the way they view math and science. It is all possible when we work together!

On behalf of the entire Physcira team, I hope you take the opportunity to create many success stories.

Thank you for hearing mine,

Anatoliy Glushchenko
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