Transcript of Danielle Cox, Mathematician

The coolest part about my job is… I have the tools to model the world around me!

The cool thing about math is that it is all around us, and it's just not the formulas and the equations that you see in kind of high school, and junior high and elementary—it is in when you Google something, the mathematics is making it so that your pages that you're interested in are the first one on the list! If you look at sunflowers, or the way trees are growing, that's mathematics as well, optimizing their growth so that they get the most sunlight so that they can grow the largest and the brightest. Any piece of technology that you pick up—your cellphones, the text messages you're getting, the songs you're buying on iTunes, how that's all encrypted, that's all mathematics. So whether you realize it or not, you're using mathematics and encountering it every day in almost everything you do.

If I say describe a chemist, or a biologist, or a physicist, they think of someone in a lab coat, with test tubes or doing experiments in a lab setting with equipment. If I say describe a mathematician, they're not quite sure what that picture looks like, but we are the same as any other scientists. We collect data; we just don't have to have a laboratory to do so. So I study an area of math called graph theory. What I focus on is different types of networks for example, Facebook. If you think about Facebook you could think of every user on Facebook as a little dot, we'll call that a vertex. And if two people on Facebook are friends, we'll draw a line between their dots, and call that an edge. So we get this visual representation of what Facebook looks like, what the internet looks like, and then we can study the structure of this graph, and the mathematics behind it, and it'll tell us something about the network its modeling.

There are so many different opportunities when you study math. You could of course go into teaching, I've had friends go and study epidemiology, and so they're using their graph theory skills to study the spread of disease, and they work with a lab. I've had friends go work for CSIS, kind of the Canadian version of CIA. I've had friends go into actuary and financial math; I had a friend who studied biology and statistics and they worked for a wildlife company going out into the field gathering on piping plovers, and then analyzing that data using their statistics. So pairing math with one of the other sciences is great, and then you can do two jobs. You can gather the data, and then use your math skills to analyze it as well.

I had math anxiety in elementary school. The reason why I struggled with math was that it wasn't being taught in a way that jived with my learning style. If you're a student in a math class, and you're finding that you're a little overwhelmed and you're struggling, speak to your teacher and maybe then they can help try to alleviate some of that anxiety and stress around the math by finding a way to explain it to you that makes sense to you.

My advice to students is to not drop math. You may not being thinking of going into a field that uses pure mathematics, but when you study math you're learning these critical, and these analytical thinking skills, you're learning problem solving skills, and they are transferable across any field. So any field that you want to do, you're going to be using that skill set, and math helps build that.

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