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Crocheting Mathematics Through COVID-19

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Synopsis

As it is often said, something good often comes out of most bad situations. The time I spent during COVID-19, at home and isolated with my two children, brought out one secret passion in me: crocheting. Not only did it help me pass the time in a sane and productive way, but also it gave me a new goal in life. It connected my math side with my artistic side. It gave me a new perspective to look at math, and helped me help others see math in a positive way.

Keywords: crochet, mathematics, geometry, COVID-19, mathematical arts.

Many little girls growing up in Turkey were taught skills like crocheting, knitting, or sewing by their mother figures. The tradition was that they were expected to make things that they would need for their marriage home while waiting to get married. During my childhood, and in my family, learning such crafts was considered a tradition of learning a productive way of passing time than getting ready for marriage. I was very interested in all kinds of crafts. I enjoyed making new things for myself and my dolls. I found that spending time making crafts brought certain kind of peace and relaxation to me. I would not know until many years later the real power of making crafts.

Fast forward to my adulthood, working through college, graduate school, post-doctorate, tenure-track job, and raising kids, which all basically took over my life. Making crafts was the last thing on my mind in the middle of all of that, and I stayed away from all kinds of crafts for well over 25 years. However, in the last few years, I found myself interested in crocheting once again, this time to keep my mind occupied as I was going through a very stressful time.

It all started when I saw a beautiful crocheted dreamcatcher in a store. The pattern was beautiful, but it was made in a very clumsy way, and I thought I could make a better one. Little did I know that this would lead me to create an online store for crocheted dreamcatchers. This little crocheting adventure became my magical companion through those difficult times, and I felt very grateful to have learned those skills early in life.

During January of 2020, I took my two daughters with me to a conference for the first time as a single mom: the 2020 Joint Mathematics Meetings in Denver, CO. As we were exploring the beloved exhibits section, and as the girls were picking up every little free item they could find, I stumbled across this book titled *Crocheting Adventures with Hyperbolic Planes*, by Daina Taimina [1]. It was love at first sight; the book and I were a perfect match! I ordered a copy, and as soon as it arrived, I started my first project of crocheting a hyperbolic plane.

Before I finished my first project, we heard the words “COVID-19” and “pandemic”, and the world shut down, including my university. At the time we thought we were only going home for the spring break, and maybe an additional week or two. The last day in my office I said to my colleague next door who specializes in geometry, “It looks like we will be home for a while, I may need another project to keep me busy. Tell me what you would like me to make that would be useful for your students.” Little did we know, we would still be teaching from home a year later, and I would need way more than one project to stay busy.

As a single mother of two children, I was stuck at home trying to figure out their online schools, which required a zillion different apps and software, while trying to figure out how to teach my online classes with the limited resources we had at the time, and trying to keep my sanity all at the same time. The amount of cooking and cleaning was increased as well because we were at home all the time and ordering food was not an option anymore. It was difficult. We all needed to learn to peacefully coexist in the house 24/7, seeing no one else, and while keeping up with our responsibilities — no easy task for anyone involved.

Once again crocheting became my magical companion. One after another I made interesting math objects including, but not limited to, Klein bottle,

Costa surface, and cross-capped disk. I had great pleasure making every one of them. I used my book for some of them, and I used my imagination for some of the others. I would be so involved in crocheting that I would lose track of time. Geometry is not my research area, so I had to read and learn the math involved as I crocheted, and that gave me great pleasure as well.



Figure 1: Möbius circles and a Klein bottle made by the author.

Due to the increased responsibilities that came from staying home with two children, unfortunately, I was not able to be involved in math very much

anymore. However, making these fun mathematical objects and reading about them kept me connected to math. It gave me a sense of normalcy — there was still math in my life. As the number of pieces increased and as I found myself making plans to make many other objects, friends started asking about what the plan was for all these, according to many “awkward”, objects. One day, I finally had an answer. Open an exhibit!



Figure 2: A sphere and a cross-capped disk made by the author.

I pass by this little art gallery on campus every day as I am on my way to teach a class for the 13 years I have been working at the University of North Florida. It is easily accessible to anyone on campus, and it displays exhibits from artists on campus and elsewhere. Now, my goal is to open an exhibit of my mathematical art when campus life gets back to, at least, near normal, to show the beauty of mathematics to our students, faculty, and staff on campus. This goal, I hope, will keep me busy, sane, and focused through the rest of our time staying home trying to keep the world safe from COVID-19.

References

- [1] Daina Taimina, *Crocheting Adventures with Hyperbolic Planes: Tactile Mathematics, Art and Craft for all to Explore*, Second Edition, AK Peters/CRC Recreational Mathematics Series, 2018.



Figure 3: A catenoid and a helicoid created by the author.

Author bio: Beyza Aslan is an Associate Professor of Mathematics at the University of North Florida. She received her Ph. D. from the University of Florida in 2007. Before joining the faculty at the University of North Florida, she was a Visiting Assistant Professor at the University of Alabama at Birmingham. Aslan studies lightning modeling to estimate the change in the electric potential due to lightning. She also studies data analysis as it relates to mitochondrial disorders.



Figure 4: A hyperbolic plane and a Klein quartic created by the author.