

2022 Math Attack Summer Camp for Girls

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Friday, July 15th – Sunday, July 17th, 2022



1 Description

The 2022 Math Attack Summer Camp for Girls was an 8-day overnight camp that was held at the University of Calgary and the Banff International Research Station (BIRS) from Sunday, July 10th - Sunday, July 17th. The camp brought 21 grades 6 - 10 students who identify as girls together to engage in fun mathematical activities and build connections. Students stayed in the university residence for the first five nights of the camp and stayed at the Banff Centre for the last two nights.

The camp aimed to encourage girls to pursue their passion for mathematics and make connections with peers who shared similar interests. Throughout the week, students engaged in mathematical sessions that explored topics such as cryptology, data science, probability paradoxes, and actuarial science. They investigated the spread of disease by modelling a zombie outbreak, learned what you can do with a math degree at a Women in Math Panel, and competed in the Amazing (Math) Race. These sessions and panels exposed students to over 20 female role models, including recent high school graduates, undergraduate math students, graduate math students, mathematics faculty, and mathematicians in industry.

During the camp, there was also plenty of time for friendship building and physical activity. Evening activities included sports, swimming, board games, karaoke, and a walk along Bow Falls Trail. On Friday, students also took some time to explore the town of Banff and hiked up Tunnel Mountain.

There was no registration fee for the camp and all meals and accommodations were provided.

2 Schedule

Time	Sunday July 10 th	Monday July 11 th	Tuesday July 12 th	Wednesday July 13 th	Thursday July 14 th	Friday July 15 th	Saturday July 16 th	Sunday July 17 th
8 – 9am		Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Checkout + Breakfast
9 – 10:15am		Visualizing the Pythagorean Theorem (Jenny Lawson) MS 431	The Amazing (Math) Race (Jenny Lawson) MS 431	Modeling Zombies (Ariane Cantin) MS 431	Data Science (Katie Burak) MS 571	Bus to Banff	Mathematical Communication (Lauren DeDieu)	Combinatorics (Dami Wi)
10:15 – 10:30am		Break	Break	Break	Break		Break	Break
10:30 – 11:45am		Probability Paradoxes* (Keira Gunn) ENA 201	The Amazing (Math) Race (Jenny Lawson) MS 431	Modeling Zombies (Ariane Cantin) MS 431	Data Science (Katie Burak) MS 571	Drop-off luggage and explore Banff (participants purchase their own lunch)	Undergraduate Student Panel (hosted by Michelle Mo)	Feedback + Closing Ceremony
11:45am – 1pm		Lunch	Lunch	Lunch	Lunch		Group Photo + Lunch	Lunch
1 – 2:15pm		Callysto Hackathon (Rania Mahdi & Jenny Lee) MS 571	Free Time	Women in Math Panel* (hosted by Kristine Bauer) ENA 201	Data Science (Katie Burak) MS 571	Hike (Tunnel Mountain)	Free Time	Bus to Calgary
2:15 – 2:30pm		Break	Break	2:15 – 3pm: Women in Math Meet & Greet MS 457	Break		Break	
2:30 – 3:45pm		Actuarial Science (Ella Charpentier) MS 431	Probability Paradoxes (Keira Gunn) MS 431	3 – 4pm: Free Time	Data Science (Katie Burak) MS 571		Mathematical Card Tricks (Lauren DeDieu)	Departure (Aurora Hall)
3:45 – 4pm		Feedback	Feedback		Feedback		Break	
4 – 5:30pm	Arrival and Registration (Aurora Hall)	Prepare Questions for Panel/ Puzzle Day	Monty Hall* (Vince Chan) ENA 201	Math Contest (Vince Chan) MS 431	Problem of the Day	Check-in and Free Time	Cryptology: Classical Ciphers (Lauren DeDieu)	
5:30 – 6:30pm	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner	
6:30 – 9pm	Introduction, Ice Breaker Activities MS 431	Sports	Board Games	Feedback/ T-Shirt Design	Movie	Origami (Dami Wi)	Walk (Bow Falls Trail)	

3 BIRS Highlights

During the BIRS portion of the camp, the focus was on helping students develop their mathematical logic and communication skills. Sessions began on Saturday with an introduction to mathematical communication. Since many K-12 schools do not emphasize communication, this concept was new to many students. We discussed the importance of communicating results precisely, using correct notation and prose to help the reader navigate. Students then broke into teams and went to the breakout rooms in the basement of BIRS to solve a mathematical logic problem and write their solutions as elegantly as possible; students then ranked the other groups' solutions based on the quality of communication and Dr. Lauren DeDieu ranked them as well and provided feedback. At the end of the session, a winner was announced. In the afternoon, students continued to develop their mathematical proof-writing skills by learning mathematical card tricks and working to explain why the tricks work.



Over the weekend, students also learned about cryptology, combinatorics, and had the opportunity to network virtually with undergraduate and graduate students from Harvard University, MIT, and Caltech; this panel of women shared their experience studying mathematics and answered our participants' many questions.

4 Outcomes of the Meeting

This camp helped inspire our female participants to pursue their passion for mathematics by making connections with female role models and peers who share similar interests. This is reflected in the following quotes from our participants:

- This camp encouraged me to pursue my passion for math because I got to see other people like me and some others to look up to.
- This camp made me realize that having a passion in math could be turned into a very interesting career with applying mathematics to different parts of the world.
- This camp changed the way I viewed mathematics as there are so many things that it is. I used to think that it is plain calculations, but it turns out that there is much more, such as programming, data science, and communication.
- This camp has probably taught me more about the field of stem than any experience i have ever experienced prior.
- This was a once in a lifetime experience, and I really loved it. The supportive attitude of everyone made it feel like home, and in only a week I've gotten so attached to everyone. It feels like we've been together for so long now. There are so many new concepts and unique ways of thinking that are going to stick with me for the rest of my life, as well as precious school advice from dozens of professionals and current students. If I could go back in time and do it again, I would.

- Thank you so much for opening my eyes up to the world of data science and more! I learnt about so many different careers that I believe I could potentially and realistically pursue. I loved seeing women that were so enthusiastic and confident in their areas, and it was inspiring to take a glimpse of what my future held by seeing the careers of those women.
- It was amazing and I felt really at ease, surrounded by girls like me. I never had to wonder, ‘will they like me? Will they judge my sunburnt Vaseline-covered face?’ like I would around boys. Often, when I’m surrounded by guys, I worry more about my appearance or my presentation or my attitude. But around my peers, I was comfortable with being myself and speaking my mind. Not only was this camp an eye opening experience, but the best part was my friends.
- This camp was such an insightful and inspiring experience. Here, I have not only learned about STEM and womens’ contributions, but also about the future of our understanding of our universe, through math, computer science and statistics. The classes were incredibly engaging and allowed me to get exposure to entire new ideas and fields. As well, I have connected with other outstanding and spectacular young women with whom I share similar interests to. I am sure this opportunity will build lasting relationships. This camp is an once in a lifetime experience to learn and explore with direction in STEM fields, while having an astronomical amount of fun.
- I loved being able to talk with the other girls and make connections! I think the people was what made this camp so fun!



5 Additional Information

Additional photos and information about the camp can be found in the *Final Report* that is available here: <https://science.ucalgary.ca/mathematics-statistics/engagement/educational-outreach/math-attack> .