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Education Notes bring mathematical and educational ideas forth to the CMS readership in a manner that promotes discussion of relevant topics including research, activities, issues, and noteworthy news items. Comments, suggestions, and submissions are welcome.

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Math Catcher Festival
For all BC Grade 4 & 5 Students
Friday, December 11th, 2020
Virtual event through Zoom - 9:00 - 12:00

The Math Catcher Festival is a celebration of students' imagination and creativity and their knowledge of mathematics and indigenous cultures and traditions. Grade 4 & 5 classes with their teachers are invited to create their own Small Number stories in the format of their choice.

We are looking for playful short stories that promote kin and friendship in indigenous settings and that demonstrate that math is interesting and that it can be used to solve real-life problems. Stories can be books, including comic books, videos, powerpoints, plays, posters...

For information about the Math Catcher Program and Small Number stories and movies and to register visit:
<https://www.sfu.ca/mathcatcher/math-catcher-festival.html>
Contact mcatcher@sfu.ca for further details

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MATH CATCHER OUTREACH PROGRAM

It is my experience that many students, at almost all levels, when encountering abstract thinking, struggle to connect mathematical concepts to everyday life. Storytelling, on the other hand, is naturally interwoven with lived experiences and opportunities for connection.

Rina Sinclair, an Elder of the Siksika Nation, showed us just how powerful storytelling can be at the First Nations Math Education Workshop in 2009. Following the workshop, I set out to create an initiative that would apply the Indigenous tradition of storytelling as a vehicle to both communicate and promote mathematical concepts. Thus, began the [Math Catcher Outreach Program](#), which aims to link mathematics to the “real world” through problem-solving, stories, and hands-on activities.

Over the past 10 years, in cooperation with Mark Mac Lean we have worked to create a [series of short stories and animated films](#) that teach math skills and problem-solving within cultural contexts. The main character in all stories is a boy called Small Number, who has an impressive aptitude for mathematics—and a proclivity for getting into mischief. Through these stories, we show students that young people, like Small Number, encounter mathematics and require knowledge of it daily. The stories highlight how mathematics can be interesting and applicable in real life situations.

The Small Number stories and films incorporate problem-solving and aim to promote Indigenous culture. Of course, Indigenous culture is not a singular cohesive set of beliefs and practices, but a myriad of traditional and modern values and practices. As a result, Small Number's adventures take place in different settings and in different Indigenous communities. The stories are available in nine First Nation languages, as well as English and French.

The program's latest initiative, the [Math Catcher Festival](#), aims to continue our work in the same direction. The festival and associated activities are based on the belief that storytelling, accompanied by pictures and open-ended questions, helps students experience mathematics in action and encourages them to enjoy math.

This initiative was inspired by the teaching practices of Ms. Alana Underwood, an elementary school teacher from Coquitlam, BC. Alana describes her practices in an article

that is available [here](#).

The Math Catcher Festival was envisioned as a celebration of students' imagination and creativity and their knowledge of mathematics and Indigenous cultures and traditions.

- In September 2020 the Math Catcher Program invited Grade 4–5 students to create, over the Fall 2020 semester, their own Small Number stories and present them in the format of their choice: a picture book, a comic, a video, a PowerPoint presentation with a voice over, a play, a poster, an animation, a computer game, or any other medium that would fit their interests.

We asked that the stories be playful and promote kin and friendship and demonstrate the following:

- that mathematics is applicable in real life;
- that young people like Small Number encounter mathematics and require knowledge of it on a daily basis;
- that mathematics can be interesting;
- that mathematics can be used to solve real-life problems.

It should be noted that the Festival took place in extraordinary times, when the classroom routines were altered by the ongoing pandemic. Just the fact that the Festival was able to proceed is a testament to the dedication of the participating students, teachers and organizing committee.

The Festival participants came from 14 schools from seven BC communities, Grand Forks, Coquitlam, Powell River, Prince George, Rock Creek, Surrey, and Vancouver. Some schools submitted work by individual students, some of the submissions were collaborations of small groups of students, some were class projects. Based on my communications with teachers, my estimate is that about 250 students participated in the Festival related activities during the months of October and November 2020.

The submissions differed in their format, from a written story to a graphic novel to a play; the length, from a several lines long story to a few PowerPoint slides to a several minutes long video; the choice of the story plot, from what happened to Small Number on the first day in a new school to how Small Number played basketball to Small Number's trip to a potlatch; the languages, from the Tla'amin language to English to French; and so on. There is even a story with a talking stone!

What was common for all of the stories was the impressive level of students' imagination and creativity and their ability to see and describe mathematics around them and to include mathematics in their storytelling.

For me, as a math teacher, probably the most valuable learning experience from reading and watching students' submissions to the 2020 Math Catcher Festival was the realization that even young students^[1] can talk about various mathematical topics in the context of the plot of their own story. The range of the mathematical topics addressed in the Festival submissions was quite wide, from counting and applying arithmetic operations to pattern recognition to presenting the elements of mathematical thinking in some of the Indigenous traditions.

As a consequence, I am even more determined that in my own teaching I continue to minimize presenting of mathematical topics in isolation. In other words, I believe that even when talking about the most abstract mathematical topics, the teacher should provide the opportunity and motivation to discuss the topic, clearly explain its importance as part of the bigger idea, and also acknowledge its connections with other mathematical and not-so-mathematical ideas and the existing or possible applications.

Another strong impression was that in many of the contributed stories, the authors had identified with Small Number's character. For example, in one story, Small Number is a boy who has no friends and has to play by himself; in another Small Number is worried that his mom will get upset because "he ripped the elbow out of his hoodie." Small Number is a city resident but also, he lives "at Bear Lake." There is a story in which Small Number is a member of the Tla'amin Nation, in another he is an Inuit. In a couple of stories Small Number is a girl, and so on.

I believe that through their identification with Small Number and the process of storytelling, the students were able to actually make mathematics personal, something that is part of their lives.

Finally, I list some of the mathematical concepts that were included in the submitted stories: mathematical thinking; problem solving; counting; algebraic operations – addition, multiplication, division; pattern search and recognition; measuring; money; time – age, scheduling; dimensions – distance, area, height, depth; sequences; geometry – shapes, angles; game theory – a fair division of a cake; approximation; mathematics and other fields – environment in particular, sports, chemistry, art.

In their feedback, teachers told us that they particularly appreciated "watching my students light up with creativity and excitement for the project" and "the freedom to explore and work together." We also learned that "[Students] enjoyed creating stories for Math."

The Festival was held online through Zoom, on Friday, December 11, 2020. All participating schools attended the event. In addition, we had several guests including Mr. Drew Blaney of the Tla'amin Nation, Mr. Ron Johnston of the Squamish Nation, and Mr. Gary George of the Wit'suwit'en Nation. Dr. Paul Kench, Dean of Science, welcomed all participants and guests.

Afterwards, one of the members of the organizing committee commented: "What an inspirational morning! So grateful to be part of this festival!"

I finish with the message from one of the teachers: "My students were so excited to share their stories and really enjoyed hearing the other students' submissions. I hope that we can participate again in the future!"

For further information about the Math Catcher Festival 2020 and to enjoy the submissions please visit <https://www.sfu.ca/mathcatcher/math-catcher-festival.html>.

[1] Grade 4-5 students are 9-10 years old.

