



2014 - 2015 AESN Case Study

School: Lord Byng Elementary **District:** # 38 Richmond

Area of Focus: Enhancement Agreement

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Our focus for this year: Place-based approaches to the teaching and learning of mathematics

Scanning: Some of the staff began their inquiry into place-based pedagogy to support their school goal of mathematics during the last school year. This was in response to a growing interest in our district into the First Peoples Principles of Learning and our AEEA goal (#2) that focuses on creating awareness and understanding for all or our students of our local aboriginal communities and cultures. Based in discussions with staff at the beginning of this school year, a new group of teachers wanted to investigate ways of teaching and learning mathematics that might engage and inspire their students, as engagement in mathematics has been identified as an area of concern in the school.

Focus: Our focus was investigating how place-based methodologies in mathematics teaching and learning may inspire and engage students in the area of mathematics.

This project is ongoing with consultation with our district's Aboriginal Education department and with consultation with UBC's Aboriginal Mathematics K-12 Network and is inspired by the collaborative resource Canoe Adventures created by Haida Gwaii community members and UBC researchers.

Hunch: Based on our interviews with students at the end of the last school year, students continue to see math as a discrete subject, something not necessarily connected to their lives or their world. Teachers want to broaden students' understanding of and experiences with mathematics.

In discussions with the teachers at Byng, there is a continuing desire to explore different ways to engage students in mathematical thinking.

New professional learning: The Byng staff continues to work towards their school goal of increased engagement in mathematics and computational fluency. On December 1, the school

hosted over 200 teachers for an Elementary Math Focus Day. A feature of the day was a session on teaching and learning mathematics with the First Peoples Principles of Learning in mind. Teachers were inspired to think about mathematics through broad themes of self-identity, story and connection to place and the environment. Teachers are also thinking about how to make mathematical learning visible and we are working strategies from the Making Learning Visible book from the Project Zero work from Harvard.

Taking action: This spring, we planned a series of mathematical experiences involving place and connection to community. Going for walks in the area, seeing math outside, visiting the river and using photographs think about mathematical problems to pose and solve were experiences provided to students in classes from kindergarten through grade six. Problems were compiled onto documentation panels and photobooks to inspire other students in the school to engage with place-based mathematics.

We had hoped to connect with a local elder to further enhance this project with language and cultural awareness but these plans were not fulfilled and will be a goal for the future.



Checking: As we looked globally at all the students involved in this project, teachers all noticed an increased interest and engagement in thinking about mathematics when students were involved in the project's experiences. We also noted an increased awareness of what mathematics is, beyond numbers and computation, and how it is used in our daily lives. One of the classes wrote short narratives on the Mathematics of Place and these short stories revealed a developing awareness of mathematics as a discipline as well as connections to community and place. We noticed that for the younger classes (kindergarten through grade two) they were focused on noticing and naming mathematics when we were outside (eg. *"That window is a rectangle."*) whereas the older students made broader connections to mathematics and how it is used and posed problems that were inspired by place (eg. *"How many fish are you allowed to catch?"*). We noticed that many of the intermediate students, when asked to pose math problems, focused on "how many?" types of math problems and this will be an ongoing focus with teachers and students as we investigate ways to have students pose different types of problems that are meaningful to them.

Reflections/Advice: Teachers involved in this project commented that by taking mathematics outside, a different dynamic around mathematics was created and that students were relaxed, curious and engaged. We also realized that the students need to learn what it means to have be a learner in the outdoors and to see the outdoors and community as a place of learning. Teachers also realized that they needed to be responsive to their students and not rush the process. The younger students did not really move past noticing and naming mathematics and we will need to build on this next year. The older students got stuck on posing the “how many?” types of math problems and will need to extend their understanding of problem types next year.

One area that we will need to further investigate is ways to assess students. We did not use a framework to measure students’ growth in this project as many of the aspects we were looking at were emergent as well as attitudinal. This is something we could look at for next year – a framework or scale to measure engagement in mathematics as well as a framework for looking at the problem-posing practices of the students.

Recommendations to other schools interested in investigating place-based mathematics would be to start by having students think about what mathematics is and then take opportunities to look for and see mathematics outside, in their community and connected to stories of place.



Byng Elementary
Division 9
Grades 1&2

*How does this picture
inspire you to think of the
story of this place?*

*What stories live
in this river?*

*What connections
are you making?*

*When I look at the boats,
I wonder how they know where the fish are?
Which way do the waves go?
I wonder how they catch the fish?
How fast can the boat go?*