# 2016 - 2017 AESN / NOII Case Study

**School Name: Smithers Secondary School**

**School District: SD#54 Bulkley Valley**

**Inquiry Team Members: Shirley White and Brad Lytle**

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**Type of inquiry: NOII**

**Grade levels: Secondary (8 - 12)**

**Curricular area(s): Mathematics / Numeracy**

**Focus area(s): Growth mindset, Universal design for learning, Project- Based, engagement**

**In one sentence, what was your focus for the year?**

**We are looking to improve students attitudes toward math and themselves as learners of math.**

**Scanning: Briefly summarize your scanning process. How did you use the four key questions as part of the scanning process? What did you notice about the experiences of your learners that were most important to your team?**

**At the beginning of the year we scanned our students for attitudes and mindsets that they had about themselves as learners, and specifically themselves as math students. We asked use images and words that represented their ideas and thoughts about math and science (they are taught together by the same teacher in the grade 8 world). The wording and the focus of the questions asked related closely to the two questions: What are you learning and why is it important? and How are you doing in your learning?**

**Focus: In a few sentences, explain why you selected this area. What changes were you hoping to obtain for your learners?**

**In general we discovered students generally don't seem to like math and had a very limited view of what it means to be good at math. Many also had a very fixed mindset about their own math ability. With this information we set out to teach/ model growth mindset in our**

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**classes. We used the work of Jo Boaler to establish classroom learning norms to help foster a growth mindset in students about their ability at math and expand their view of what it means to be " good" in math.**

**Hunch: Describe your hunches about the ways in which practices at the school may have been contributing to the experiences of your learners that were of concern to you.**

**Math concepts are often practiced in isolation, with a lot of focus on correct answers and at the speed at which they can be completed ( ie Mad Minutes) Speed and Accuracy to parameters that students commonly use to define themselves as either good or bad at math. We wondered if developing rich problem /project based tasks, while fostering the habits and attitudes and learning norms that encourage the development of a growth mindset improve ours students level of engagement and attitudes toward math and their math ability**

**New professional learning: What new areas of professional learning did you explore? What resources were most helpful? What specific designs did you use to support the learning of your colleagues?**

**Jo Boaler's book Mathematical Mindsets and the her youcubed.org website were the most valuable resources for our journey. We worked together as a grade 8 team along with Aboriginal Curriculum support task to develop rich project based tasks.**

**Taking action: Describe strategies you and your team decided on and how your actions worked out.**

**We spent the first 2 weeks of the school year in September doing a variety of activities in both in science that helped identify our growth mindset/ learning norms. By the end of the following norms were established and represented by only a few words : 1) Teamwork 2) Want it ! Keep it! 3) Believe 4) It's not about Speed 5) Mistakes are manitory 6) Question , Question Question 7) Everyone can learn 8) Look for Patterns.**
**In each unit of math/ science the students completed a hands on final project that applied skills learned in math and science. The most popular project according to the year end reflection was the " Great Bannock Challenge" which touched on ratios and fractions as well as our over-arching theme of staying healthy at a cellular level in science. At the end of each unit students also reflected back on the learning norms to establish which was most useful and helped them with their learning journey in the unit.**

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**Checking: Summarize the differences you made. Were they enough? Were you satisfied?**

**At the end of the year we  brainstormed what we had done and learned throughout the year. After generating a web of information the student then had the students answer a variety of questions related to their learning journey and our classroom learning norms. Variations of all four questions were included in the questions that the students needed to answer. The students then had to create a graffiti of wall with image and words to represent their answers. It was clear from the visual representations of the students learning that the hands-on projects had increased the level of engagement and interest in math. It was also evident that learning norms had also played a significant role in how students view themselves as learners. Not about Speed and Mistakes are mandatory were the two biggest areas of leaning for many of students.**

**Reflections/Advice: Finish by sharing what you learned from this inquiry, where you plan to go next, and what advice you would offer other schools with a similar interest.**

**We feel that our journey has just begun. We plan to go deeper next year in terms of project/problem based learning opportunities for our students. It was clear also from the reflection that the why and the connection behind some of the tasks was still lost for some, thus an area of focus for next year. There were some learning norms such as patterns and "more then one way" that are essential to truly changing a students attitude and understanding of math need to be more deliberately and consistently taught throughout the year. Consistently throughout the year, is something we want to do in terms of the all learning norms - perhaps at the end of each week instead of each unit. We feel that our work has been meaningful but we are just at the beginning of our journey and plan to continue with a similar focus next year.**