2013-2014 NOII Case Study

School: Gifted Pullout Program **District:** SD60 Peace River North

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Question / focus area: Will fostering relationships between school, community and family (3 legged stool model) be an effective "outside the box" method for teaching [the gifted]?

Scanning: Our students learned to:

- Develop relationships (instead of adversarial positions on controversial subjects)
- Use fact-based conclusions yielded in scientific inquiry (rather than popular opinion) to plan "next steps"

Focus: Can we connect middle/high school students with scientists so that they may investigate their student-generated hypotheses:

- "What's the difference between pre and post use barium sulphate?"
- "Are there any interesting compounds in the soil near frac sites?"

Hunch: Education is a three-legged stool: Community, School and Family. Our gifted program is actively involved in community both at local & global level, especially in humanitarian and environmental projects. However, the opportunity exists to connect with the business (resource based) community and the scientific research community. We hope to expose our learners to these other perspectives, as they encounter "what if" scenarios in the North Peace and beyond.

New professional learning:

- **Teachers**: Went to Canadian Light Source for "teachers on the beamline" training.
- **Students & Teachers**: Got industry level safety training through CLS, so that we would have the necessary training to use the beamline.
- **Students**: Used the IDEAS beamline (XRF & XANES spectra) to determine the "overall picture" of elements in their samples; then focused in on certain elements (Iron, for example).
- **All**: Participated in workshops/field studies/further inquiry/scholarly readings/training led/recommended by industry partners on a) hydraulic fracturing & b) synchrotron use

Taking action: The students were able to at least partially answer their research questions, though the IDEAS beamline can't "see" hydrocarbons. They found the experience invaluable.

- The students developed relationships with industry and the scientific community, and are using those relationships and scientific inquiry to "delve deeper" into their questions next year.
- Seven of the students are interested in further pursuing the study of hydraulic fracturing via science fair (three are moving on to post secondary, one isn't interested)

Checking: We are proud of many things:

- Our students were the first team from BC to participate in "Students on the Beamline"
- They tapped industry relationships and science to learn more about a controversial subject
- They compared their scientific inquiry to the science undertaken by researchers and discussed the merits of having a large enough sample size & enough control samples
- They talked about the importance of "the right tools for the job" – as our research is largely about hydrocarbons (oil & gas), yet the IDEAS beamline can't "see" hydrocarbons. Next time, the kids would like to use a more sophisticated beamline. Having said that, using the IDEAS beamline was completely appropriate for this stage.

Reflections/Advice:

- We learned that there is powerful teaching & learning in the "guide on the side" method that we had to employ (we couldn't influence the students or their inquiry).
- We're really happy that most of our kids want to further develop their understanding of hydraulic fracturing; they don't see scientific inquiry as "finding the right answer," but as a thoughtful process.
- We wish that we had involved the First Nations Community earlier than we did; We took them to Wanuskewin Heritage Park on our last day of inquiry in Saskatoon. Muskwa (a First Nations dancer) said, "Water is the most important thing," but we didn't have enouh time to connect the dots between First Nations Culture, environmental stewardship, and hydraulic fracturing best practices.