**SaskMATH RESOURSES FOR**

**Mathematics as a Human Endeavour**

**Indigenous Ways of Knowing**

Indigenous Culture-Based School Mathematics for Reconciliation and Professional Development research project[[1]](#footnote-1)

**Parts Relevant to SaskMATH**

**Template for Developing Indigenous Culture-Based Mathematics Lesson Plans or Modules**

1. Holding a two-day culture immersion. (Duchscherer et al., 2019, pp. 18-25).
2. Mentoring each teacher by Sharon on the topic “Indigenous mathematizing” for a half-day release time during October. (Duchscherer et al., 2019, pp. 25-26).
3. Mentoring the development and revision of the 1st two lesson plans or modules (Duchscherer et al., 2019, pp. 26-37).
4. Collaboration with a school principal and the teachers developing lesson plans or modules is central.
5. Consequences for students: teachers’ observations (Duchscherer et al., 2019, p. 38).
6. Further observations and insights for developing lesson plans or modules: What needs to be learned and unlearned (Duchscherer et al., 2019, pp. 42-61).

6.1 Teachers needed initial support:

 (a) finding authentic Indigenous sources of information,

 (b) learning some features of local Indigenous cultures,

 (c) locating examples of Indigenous mathematizing, and

 (d) creating a support network among local teachers.

6.2 Teachers needed continuous initial support:

 *Unlearning*:

 (a) certain Euro-Canadian ways of understanding Western mathematics; e.g., unlearning Plato’s philosophy of mathematics

 (b) certain Euro-Canadian ways of perceiving the world

 (c) ways that interfere with cross-cultural understandings; e.g., All students are able to excel at mathematics.

*Learning*:

(a) plurality of mathematical systems

(b) inclusion is not enough

(c) what is mathematics? – a human endeavour, etc.

(d) how to avoid subtle appropriation

(e) two-eyed seeing

(f) equity in identifying students who may have potential to excel at mathematics

A recommendation for how to scale-up the materials development process province-wide is described in Duchscherer and colleagues, (2019, pp. 71-72).

**Lesson Plans**

These lesson plans were developed for a specific grade. However, they can be redeveloped for another grade by more difficult, or easier, Indigenous mathematizing activities.

1. *Freestyle Looming and Probability*. Grade 12.

 <http://mcdowellfoundation.ca/isl/uploads/2018/07/1.-E-A.-Freestyle-Looming-and-Probability.pdf>

1. *Picario: A Traditional Indigenous Game to Develop Spatial Reasoning, and Analytical and Critical Thinking Skills*. Grade 10.

<http://mcdowellfoundation.ca/isl/uploads/2018/07/1.-E-A.-Freestyle-Looming-and-Probability.pdf>

1. *Water, First Nations Cultures, Statistics.*Grade 9.

<http://mcdowellfoundation.ca/isl/uploads/2018/07/3.-E-B.2-Water-First-Nations-Cultures-Statistics.pdf>

1. *The Language of Negative and Positive Numbers***.** Grade 6.

<http://mcdowellfoundation.ca/isl/uploads/2018/07/4.-E-C.1-The-Language-of-Negative-and-Positive-Numbers.pdf>

1. *Stick Games, Theoretical/Experimental Probability, & Combinatory Logic.* Grade 6.

<http://mcdowellfoundation.ca/isl/uploads/2018/07/5.-E-C.2-Stick-Games-and-Theoretical-Experimental-Probability.pdf>

1. *Multiplication and First Nations Drumming.* Grade 5.

<http://mcdowellfoundation.ca/isl/uploads/2018/07/6.-E-D.1-Multiplication-and-First-Nations-Drumming.pdf>

1. *Quadrilateral Patterning through Indigenous Beading.*Grade 5.

<http://mcdowellfoundation.ca/isl/uploads/2018/07/7.-E-D.2-Quadrilateral-Patterning-Through-Indigenous-Beading.pdf>

**Videos**

1. ***Birch Bark Biting lesson***(Sharon Meyer. Grade 5. Excerpts, 6:38 minutes). “The storyline goes from students holding real birch bark and concrete birch bark artefacts, to students learning birch bark biting and learning the ideal abstract concepts of right angles, complementary angles, and lines of symmetry” (Duchscherer et al., 2019, pp. 112-113, photos included).

<https://www.youtube.com/watch?v=EUGEdUWs1cU&feature=youtu.be>

1. ***Dream Catcher lesson***(Sharon Meyer. Grade 6. Excerpts, 6:10 minutes). “The storyline goes from willow trees to geometric shapes. Sharon Meyer introduces a Grade 6 class to making a dream catcher.” Students end up by personally experiencing and then discussing two-eyed seeing. (Duchscherer et al., 2019, pp. 113-115, photos included).

<https://www.youtube.com/watch?v=28MGizBhEBc&feature=youtu.be>

1. ***A Conversation* (**Sharon Meyer and Serena Palmer. 18:34 minutes). “Sharon and Serena highlight key events and notable insights gained from Serena’s participation in the research project … Personal details animate: the importance of a culture immersion, how to plan an Indigenous culture-based lesson, student engagement, and collaboration within the school and with others outside the school” (Duchscherer et al., 2019, p. 115)

<https://www.youtube.com/watch?v=p1rlphwI6RM&feature=youtu.be>

1. Duchscherer, K., Palmer, S., Shemrock, K., Vankoughnett, D., Caron, S., Meyer, S., Aikenhead, G., Cardinal, K., Sylvestre, D., & View, T. (2019). Indigenous culture-based school mathematics for reconciliation and professional development. Saskatoon, Canada: Stirling McDowell Foundation. Retrieved from <http://mcdowellfoundation.ca/research/culture-based-school-mathematics-for-reconciliation-and-professional-development/>. [↑](#footnote-ref-1)