INDIGENOUS LEARNING CIRCLES IN STEM EDUCATION

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Territorial Acknowledgement

- The University of Waterloo acknowledges that much of our work takes place on the traditional territory of the Neutral, Anishinaabeg, and Haudenosaunee peoples. Our main campus is situated on the Haldimand Tract, the land granted to the Six Nations that includes six miles on each side of the Grand River. Our active work toward reconciliation takes place across our campuses through research, learning, teaching, and community building, and is coordinated within the Office of Indigenous Relations.

Map source: Adam Lewis, "Living on Stolen Land," Alternatives Journal December 2015
Image sourced: https://uwaterloo.ca/indigenous/first-nations-groups-within-university-waterloo-territorial

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shé:kon / hello

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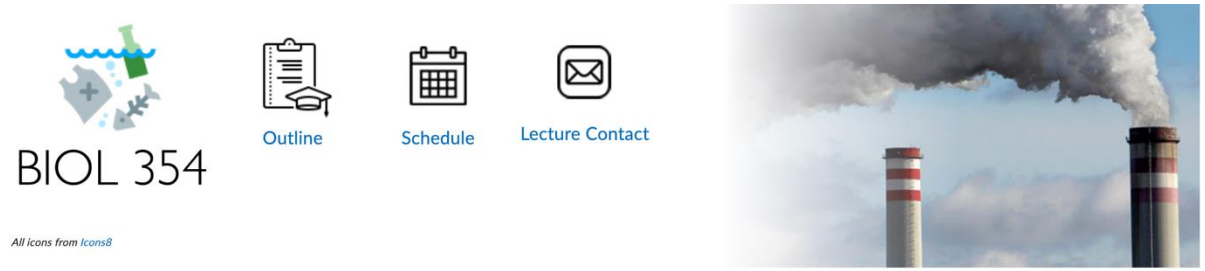
LITE Seed Grant Project

- Supporting STEM education through the implementation of Indigenous Learning Circles as a pedagogical approach to learning in large-scale STEM classes
- Circles will provide students with opportunities
  - for relational and reciprocal learning
  - fostering critical thinking and problem-solving skills
  - to increased engagement and sense of community



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Project Goals

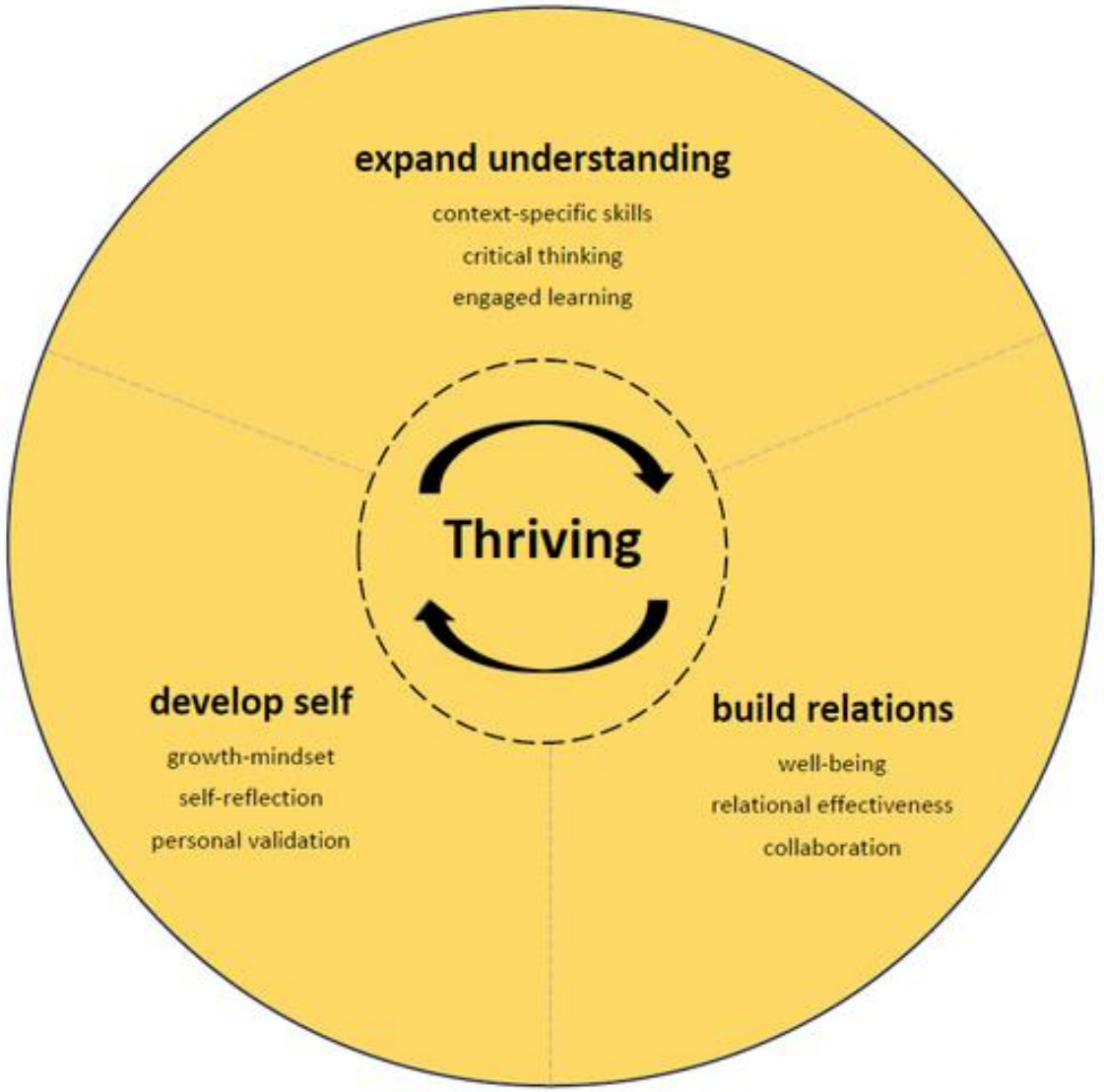
- The following are intended outcomes from the incorporation of Indigenous Learning Circles into STEM courses:

1. Deepen student understanding of the subject matter taught in lectures or tutorials and make meaningful connections between theory and practice.
2. Compare current lecture/tutorial methods and Indigenous Learning Circles with respect to enhancing learning and community building.
3. Employ decolonial practices into STEM instruction and learning environments.
4. Create a framework for the use of Indigenous Learning Circles in STEM courses at UW.

Art by Kat Brown Akootchook (@sweetgrass_and_sage)

Linking to WatSee

- Goals of WatSee
  - Expand understanding
  - Develop self
  - Build relations



https://uwaterloo.ca/provost/watsee

WatSee Toolbox

Provide a Territorial Acknowledgement	Decolonize Teaching & Learning	Adopt Pronouns & Self-Identified Names	Facilitate Course Alignment
Incorporate Inclusive Pedagogies	Support Student Well-being	Foster an Inclusive Community	Promote Student Supports
Utilize Active Learning Strategies	Employ Critical Reflection Activities	Provide Effective Feedback	Promote Sustainability
Focus on Student Purpose	Incorporate SLICCs into Courses	Foster Belonging through Connections	Provide Guidance to Graduate Students

https://uwaterloo.ca/provost/watsee/instructor-and-graduate-student-supervisor-toolbox

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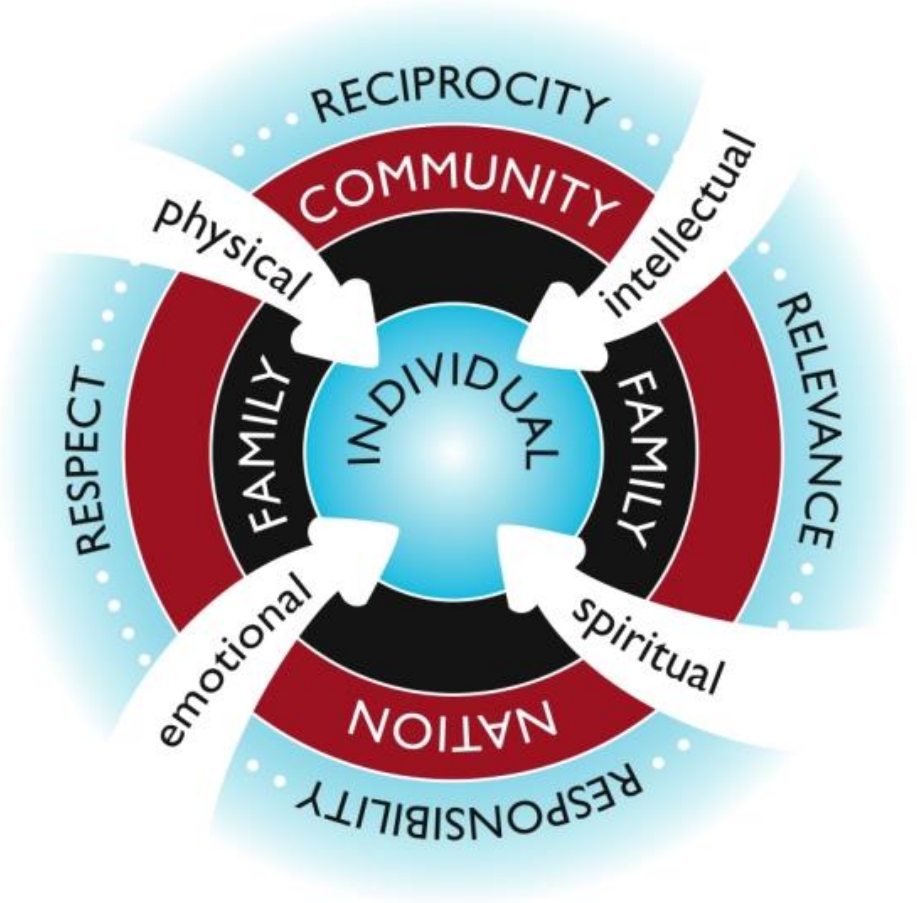
What is a Learning Circle?

- "Communities use talking circles as part of ceremonial, healing, educational, and legal systems, depending upon intentions and contexts, and also use them as a way of bringing people together to pass on cultural knowledges, practices, and values." *(Barkaskas & Gladwin, 2021)*
- Grounded in Indigenous learning pedagogies where the intention is to centre **relational learning:** being in community, knowing one another, and learning together
- Meant to deepen our understanding of content and support more effective learning
- The goal of our circles is to help you understand how to think through problems, to create opportunities to work collaboratively, and to support one another
- A principles-based approach that is more effective than traditional group work

Learning Circle Principles

- The 4 R's:
  - **Responsibility**
    - We owe it to each other to participate and be present
  - **Respect**
    - We are kind and welcoming to one another
  - **Reciprocity**
    - We work together, giving and receiving in equal measure
  - **Relevance**
    - We connect our knowledge to the problem

(Kirkness VJ & Barnhardt R., 1991; Pigeon, M., 2008, 2015)



Wholistic Indigenous Framework, Michelle Pigeon (2015)

Learning Circle Protocols

Determine Speaking Order

- Enter the space with good intention. Determine who speaks first, and which direction your circle will move in. On Haudenosaunee territory we go counterclockwise.

Introductions

- Share your name, preferred pronouns (optional), program, and where you come from/places you are connected to.
- The first speaker can review the question/problem that is being discussed.

Circle Discussion

- All comments are related directly to the question or topic of consideration. Share your process, thoughts, areas where you struggled, and questions you might have.
- Every person in the circle gets the opportunity to speak before a group discussion begins.
- After you have gone around the circle once, you can address things that one another brought up and discuss together.

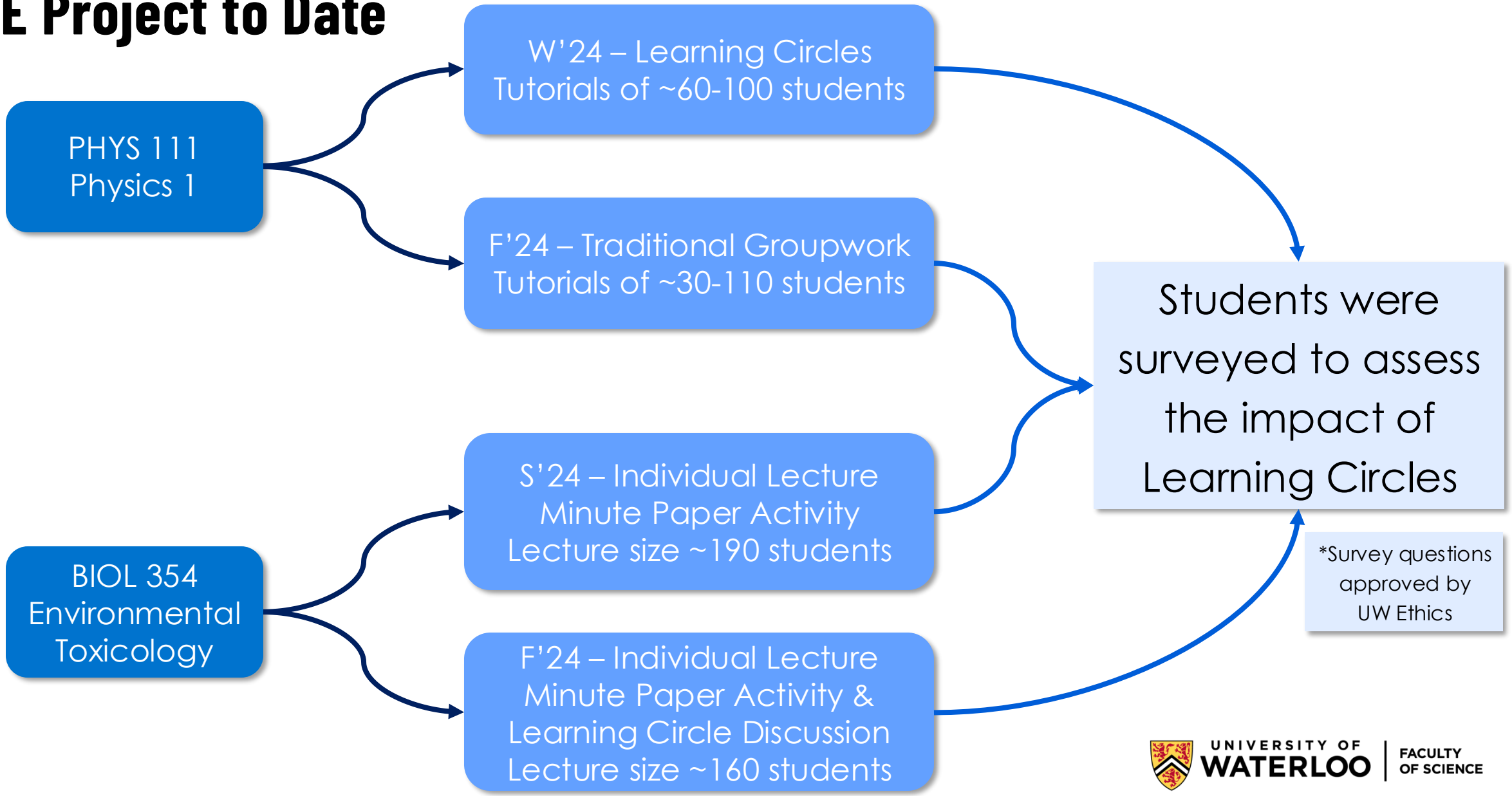
Close the Circle

- When everyone has had the opportunity to speak, ask questions, and discuss together, the group decides collectively that they are ready to close the circle. Remember to leave enough time to complete any required tasks.

How did we use Learning Circles?

- Before each course, Savannah trained the Circle facilitator, TAs, and Instructors
- Students were presented with a problem at the beginning of the class/tutorial (Phys) or asked to reflect on the lecture topic that day (Biol)
- Self-organized into groups of four or five people for a Learning Circle
- Engage in a Learning Circle
  - Physics - discussed the problem, how to understand it, and how to solve it
  - Biology - helped one another clear up any confusion on challenging concepts
- Work collaboratively to build their knowledge

LITE Project to Date



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Instructor Thoughts

- Biology
  - Students have meaningful discussions to help clear up any confusing topics
  - Some groups did not engage in discussing relevant topics (some students disengaged or left lecture) → modified when the Circle took place & kept protocol slide displayed
  - Students commented that they enjoyed the Circles on the course evaluations
  - What about the next time the course is offered?
- Physics
  - Student participation and efficiency of Circles was highly dependent on TAs present as they act as mentors for each Circle
  - Students really enjoyed the Circles and the ability to work with others to solve problems in a safe space where mistakes can be made

QUESTIONS?

- If you are interested in learning more about Indigenous Learning Circles or Indigenous Science Initiatives, reach out to Savannah (savannah.sloat@uwaterloo.ca)

- If you are interested in learning more about how Learning Circles have been incorporated into Physics/Biology, reach out to Brenda (brenda.lee@uwaterloo.ca) or Vivian (vivian.dayeh@uwaterloo.ca)

Braiding Sweetgrass, Robin Wall Kimmerer

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