



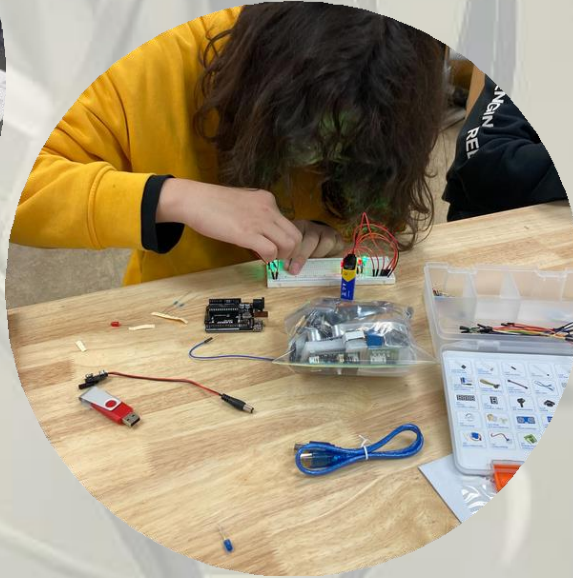
**Future Skills
Centre**

Building Pathways into STEM Innovation Futures for Indigenous Youth

Program Pilot Overview & Impact Summary

**MindFuel's Canada Tech Futures Initiative
April 1, 2021 - June 30, 2023**

Overview



- Thank you
- Pilot Intent & Goals
- Pilot Journey
- Pilot Impacts
- Beyond the Pilot

We acknowledge that we are on the traditional territories of many Indigenous peoples, Metis & Inuit whose footsteps have marked these lands for centuries.

Our working together & learnings happened on the lands of Northern BC, Treaty 6, Treaty 7, Treaty 8, and Yukon.



Thank you & Acknowledgements

To our Indigenous Collaboration Partners - the Students, Teachers & Communities:

Thank you for welcoming us into your schools & communities, learning together, and teaching us more about our programs and ourselves than we could have even imagined at the beginning of this journey.

We are grateful, humbled & we look forward to our continued learning together.



To our FSC consultants, partners and funders:

With each conversation, email, insights, wisdom & understanding that you shared, we learned more, and our Pilot evolved, our journey became clearer, and without a doubt, grew beyond our initial expectations and ideas.

Transformer Funding Partner



Supporting Funders

- Anonymous
- Government of Canada (CanCode)
- Schulich School of Engineering, University of Calgary, Dr. Meera Singh
- NSERC PromoScience
- RBC Foundation (Future Launch)
- Syncrude (operated by Suncor)
- TC Energy

Advisors & Consultants

- Andreas Johnston, FSC Evaluation Advisor, Johnston Research Inc.
- Aytaj Pashayeva, FSC Program Manager
- Claire Buré, FSC Accelerator Advisor
- Dawn Pratt, Founder, askenootow STEM Enterprise Inc.
- Gordon Chan, FSC Accelerator Advisor
- Julie Legault, Founder, Amino Labs
- Toronto Metropolitan University, FSC Research & Ethics advisor
- Tracy Zweifel, Program Consultant

Collaborators & Partners

- AC Robotics
- Alberta Native Friendship Centres Association
- EiAmplified
- Tutoring Education Centre
- Firecracker Strategies
- IndigeSTEAM
- Northland School Division
- Yukonstruct

Pilot Intent & Goals

Inspired by MindFuel's first all-Indigenous Tech Futures Challenge (TFC) team and their innovative student project, MindFuel's FSC pilot's mission focused on increasing STEM innovation learning opportunities for Indigenous youth in AB, BC & YT rural & remote communities.

Pilot vision: To create learning opportunities that will spark creativity, strengthen prior knowledge in STEM, support ideas and build interest in future studies and work in STEM.

Pilot approach: focus on student project-based hands-on learning, knowledge sharing, mentoring, and interweaving Indigenous ways-of-doing & Western science.

Ultimate outcome: To create a framework that supports long-term economic opportunities for Indigenous youth.



Students & team advisors of the Siksika Nation High School Robotics Team

Key Pilot Goals

Students develop, complete & share their own STEM project

Support 70 Indigenous students from rural/remote communities

75% student completion rate in Pilot activities

70% students indicate improved innovation mindset & skills

Knowledge share learnings with communities & forward

Collaborate with 3 Indigenous collaboration partners: 1 in each: AB, BC & YT

65% students indicate increased access to computers & tech resources

65% students indicate increased interest in high school/ post-secondary STEM courses

Key Milestones for Developing & Delivering Pilot's Goals:

- Objective 1: Engagement through Understanding Community Needs. Conduct two-part needs assessment in developing STEM skills & resilience to capture Indigenous students' perspectives & needs, to achieve Equity Diversity Inclusion (EDI).
- Objective 2: Program Accessibility. Increase access to innovation skills development & quality STEM education.
- Objective 3: Technology Access. Increase access to technology to locations that lack access and connect key partners that provide tech/WiFi or offline support, to achieve EDI.
- Objective 4: Knowledge Mobilization. Share project learnings and outcomes re: how to support Indigenous youth in developing an innovation mindset and resiliency.

Flexible innovation mindset learning model

To support increasing opportunities for Indigenous youth in STEM and innovation within each community, we practiced and prioritized:

Practice cultural safety



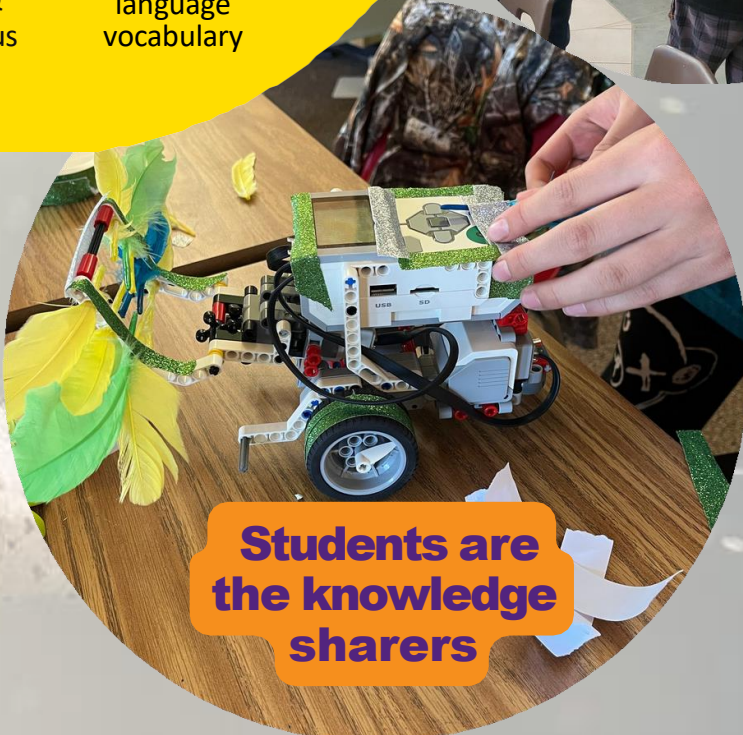
Support community capacity building



Listen, Learn & Adapt - ongoing



Provide accessible tech & scaffolded activities with examples & models



Students are the knowledge sharers

Collaborations & Outcomes

Each of the six Pilot communities has unique, rich histories, learning needs, and community & educational interests; and our work together with each community grew to different levels of collaboration depending on our developing relationships, community needs, & global challenges, in particular the pandemic. Here is a brief overview of each collaboration:

Year 1: 2 digital teacher workshops on coding & automation
 Year 2: week-long in-person programming in Nov. 2022: teacher professional learning workshops & student workshops on coding & automation; tech deliverables

Year 1: 2 digital training workshops for youth educators from eight communities on coding & automation; activities paused due COVID-19
 Year 2: remained in contact with ANFCA contact; no specific activity together due to ongoing COVID-19 challenges

Year 1: 2 digital teacher workshops on coding & automation; 6 digital & 4 in-person student workshops on coding & automation, 1 student team participation in TFC 2022; tech deliverables

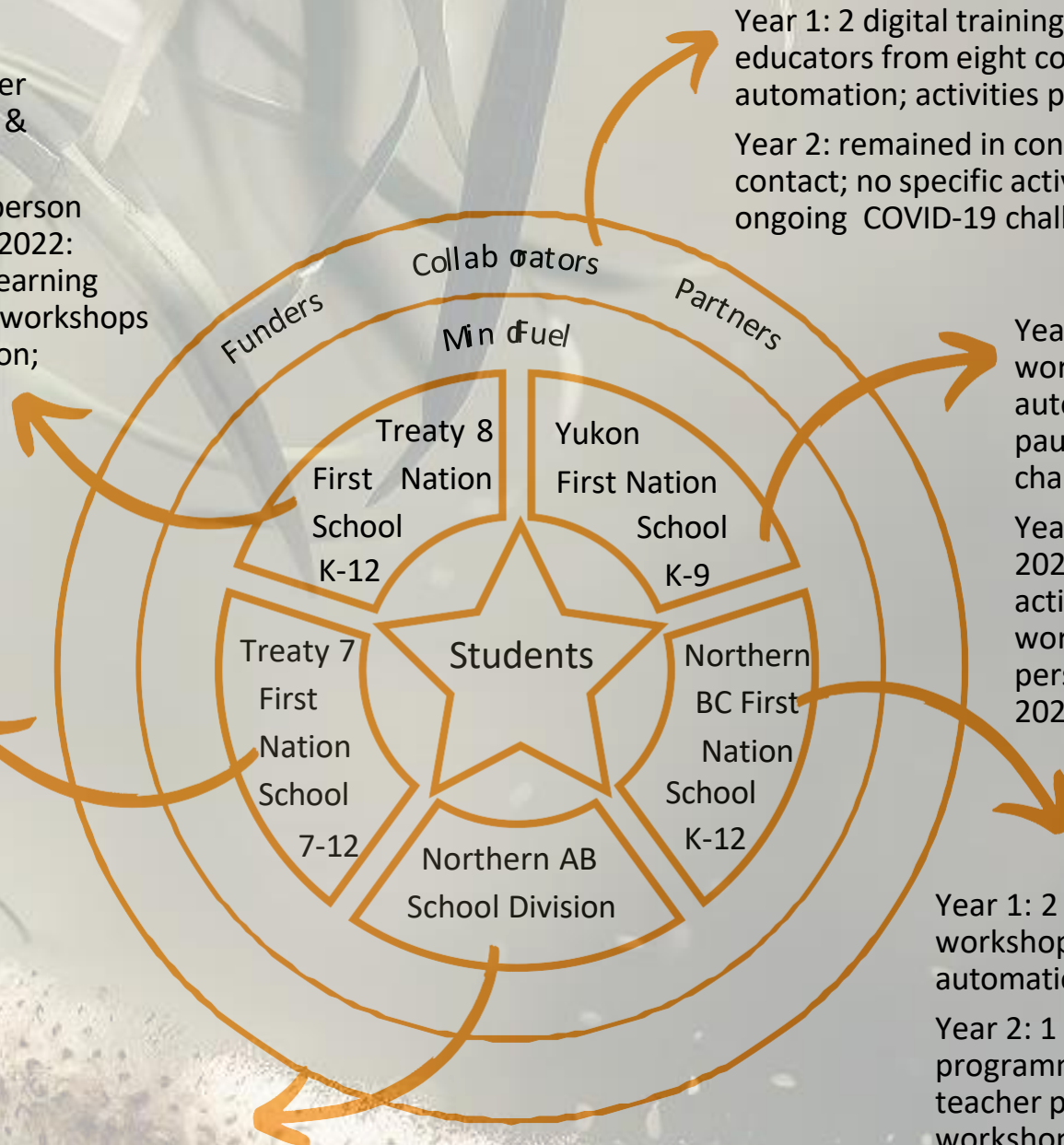
Year 1: 3 digital teacher workshops on coding & automation; activities paused due to admin change
 Year 2: 1-day visit in Nov. 2022 doing a tech & fur activity; 2 digital student workshops; 1 week-long in-person program in May 2023 on coding & robotics

Year 2: 6 in-person & 4 digital student workshops on coding & automation; 1 full-day teacher professional learning workshop on Project-Based Learning; tech deliverables;
 1 student work week for 5 grade 12 graduates at MindFuel

Year 1: 2 digital teacher workshops on coding & automation
 Year 2: 1 week-long in-person programming in Oct. 2022: teacher professional learning workshops & student workshops on coding & automation; tech deliverables

Year 1: 2 digital teacher workshops on coding and automation; tech deliverables
 Year 2: 10 teacher digital workshops; 7 digital mentorship sessions during class time; 1 virtual student Showcase in April 2023; Tech deliverables

MindFuel team was readily available to troubleshoot & support via digital platforms throughout the entirety of the program.



Pilot Impact

With each community Pilot partner, building relationships was prioritized first, which led to skills building workshops with teachers and/or community educators, and then working directly with the students. Foundational with each workshop was working with a STEM technology new to the teachers & students, and project-based learning.

All students worked on smart circuit models, guided with scaffolded Pilot activities.



1 student team created an algae bioreactor with team advisors for the 2022 Tech Futures Challenge, Jan - May 2022.

2 student real-world community-based group projects during in-person week-long session, Oct - Nov. 2023.

15 students created their own STEAM projects for school district Showcase, April 2023.



Workshops

46 student sessions
31 teacher workshops
5 week-long in-person community visits

283 Indigenous students from 17 rural/remote schools

Collaborated with 6 Indigenous collaboration partners

4 in AB,
1 in BC & 1 in YT

Resources

7 videos,
27 activities &
1 showcase event developed & delivered

Tech

512 kits, 13 laptops & 145 tech incentives distributed

Direct impact: student activity sessions & teacher workshops:

- Increase in student attendance.
- increase in student participation in STEM activities.
- Increase in student motivation to continue learning.
- Strengthened teacher supports for learning a new tech and incorporating it into classrooms.
- Increased teacher knowledge, skills & confidence teaching about technology and innovation.
- Increased participation by students due to project-based learning and the design thinking process, which aligns with Indigenous ways of learning and doing.
- Increased student understandings of STEM fields & careers.

Pilot Impact

The students' and teachers' reflections, sharings and insights tell even more of the story.



80% of students stated, "I kept working with the sensors, breadboard and coding even when parts of it didn't work."

88% of students stated, "I found using new technology fun."

"I wanted to keep working because I wanted to make it work." (student)

73% of students stated "I have more interest in enrolling in STEM classes at high school/post-secondary school."

88% of teachers/educators agreed that, "The learnings from this workshop will help me to support youth in building STEM skills relevant to the real-world."

100% of teachers/educators agreed that, "Students who have accessed Coding & Automation activities show an increased interest in pursuing a job/work/career in a STEM field."

"It is so exciting to teach 'real life' lessons to young people!" (teacher)

"This is the first time I've seen them with their cameras on." (online school teacher)

- "It made me curious on why it wasn't [working] and then figuring out why it wasn't working and fixing the problem." (student)
- "It was challenging and exciting at the same time." (student)
- "Something indecipherable became more easy to understand." (student)
- "My students were successful. It helped the students problem solve and think analytically." (teacher)
- "It helped me to learn the knowledge and skills to facilitate coding and digital skills. I've gained more confidence in teaching and facilitating students and improving their skills." (teacher)
- "Why do you have to leave?" (student) / "When are you coming back?" (teacher)
- "Thank you for coming back when it gets hard." (teacher)

Collaborating Together - Continuing Beyond Pilot

We are excited that there are plans &/or intent to continue working and learning together with each community.

Return community visit planned for September 2023 for weeklong in-class coding & automation classes for grades 3-12 students, and professional learning & support for teachers.

Reconnection with ANFCA. Meeting in September to share organization plans and explore collaboration opportunities.

New in Year 2: Developed a formal partnership with IndigeSTEAM. Continuing to support each others events, and plan to co-apply for grants.

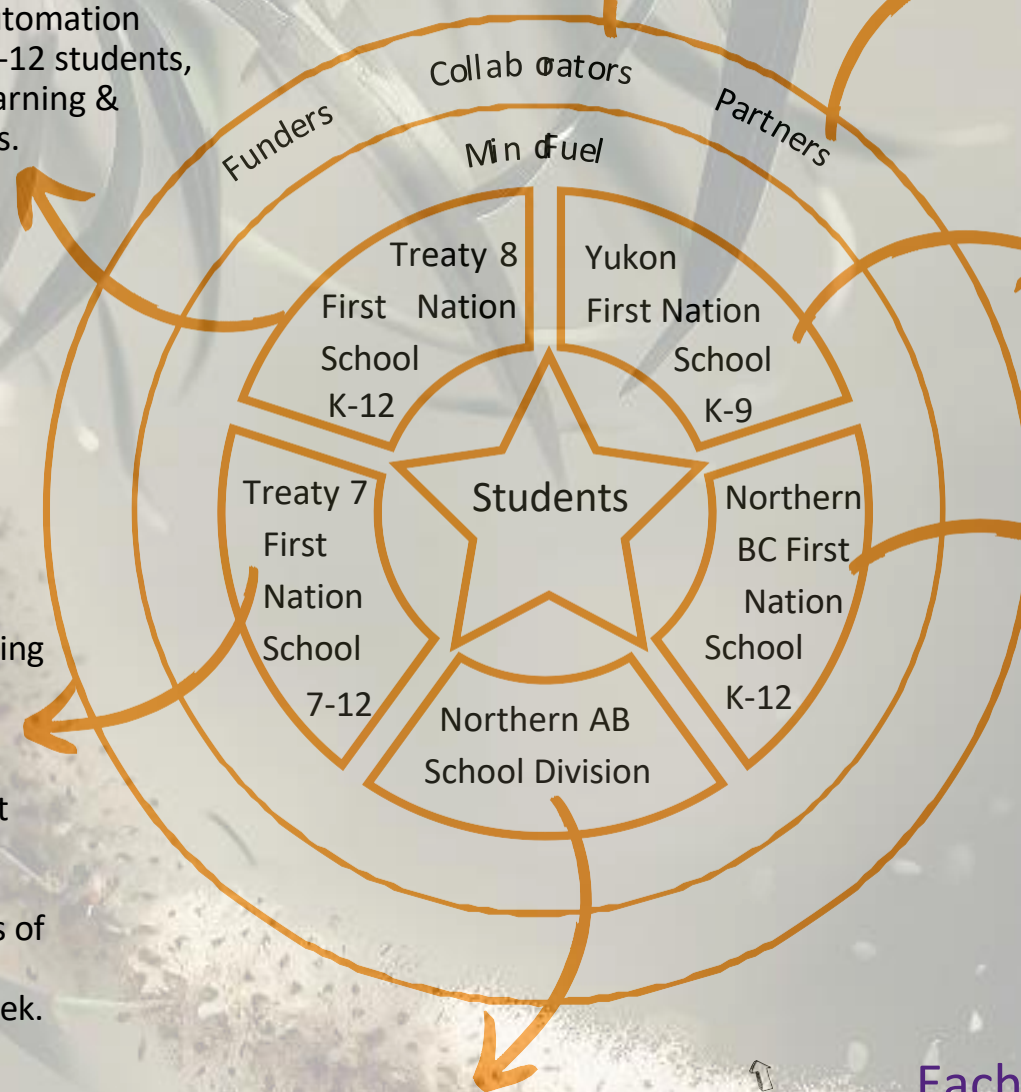
Return community visit planned for November 2023 for weeklong in-class robotics and coding classes for grades K-9 students. Regular yearlong support for new robotics club to be confirmed in September.

Continued professional learning for teachers to be confirmed in September 2023. Additional student work proposed to the grade 12 graduate students of the June 2023 Student Work Week.

Return community visit planned for October 2023 for weeklong in-class coding & automation classes for grades 3-12 students, and professional learning & support or teachers.

Continuing yearlong professional learning & support for grade 5-12 teachers with 3 workshops per year, including training for new teachers. District Showcase of students' projects planned for April 2024.

Each relationship continues to be unique with plans for a different level of collaboration with continued co-planning and co-delivery.



Vision for the Near Future -- Next Steps

Through our learnings and experiences during this two year project, to truly meet students, teachers, and communities needs and interests in STEM and innovation, more than a two year collaboration with community is needed.

All of these collaborations are at a strong next steps point, rather than a project conclusion. With thanks to all the students, teachers, collaborators & partners who we have worked with, there is a solid path forward to engage current and new Indigenous communities.



RECOMMENDATIONS

- Create & implement a 5-7 year program plan that leads to community self-sustainability of the learning program, and critically, build and share a body of knowledge that supports other Indigenous community engagement.
- Engage fundering partners with multi-year dynamic funding that has a flexible, yet accountable time line, supports cultural components including food & additional wraparound supports, and professional learning for teachers, communities & MindFuel team.
- Develop more paid Indigenous Student Work Weeks to evolve into full Summer Work Programs
- Support Indigenous youth innovation projects to commercialization and support community job creation & economic growth.

In keeping with the MindFuel mission, we are committed to long-term relationships to support increasing Indigenous youth STEM innovation learning experiences and project development, and welcome partners, volunteers, and interested communities to participate in this mission.





**Future Skills
Centre**

The MindFuel Foundation

Core Project Team

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Freeda Mulenga, Director, Finance

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