MindFuel™

Learning Together

With & For Indigenous Youth in STEM and Innovation

25 years of collaboration

Publication Date: June 2025

With Gratitude

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

Thank you for welcoming us into your schools and communities for 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 and we look forward to our continued learning together.

Thank you, and with appreciation.

We acknowledge that our collaborations and work take place across the traditional territories of many Indigenous communities, who have lived on and cared for these lands since time immemorial, and we honour their deep connections to the land, waters, and communities. We are committed to walking the path of truth and reconciliation and, we are grateful to live, learn, and work in these territories, as we continue to seek to understand how to deepen meaningful relationships with Indigenous peoples.

Ways of Doing

Since the early 2000s, our work has grown through three key programs that reflect our commitment to collaboration and responsiveness to community needs. We began with the Ways of Knowing: Science-in-a-Crate series, followed by the integration of First Nations, Métis, and Inuit perspectives into Wonderville, and later expanded to community programs that include in-person visits and virtual engagements starting in 2019.

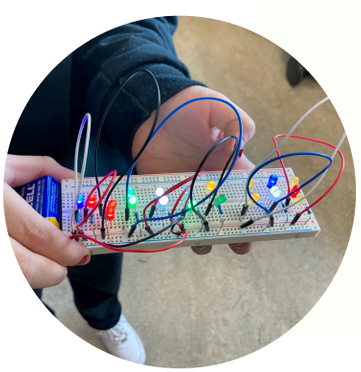
Each program is shaped by the unique histories, educational interests, and learning needs of the communities we worked with. Our approach has always been relationship-driven—starting with professional learning workshops for teachers, and evolving into hands-on activities with students. The depth and pace of collaboration varies across communities, guided by our growing relationships, local priorities, and global challenges.

Through humble collaboration and experiences with our Indigenous community partners we continue to evolve to more meaningfully support Indigenous youth in developing an innovation mindset. We have learned these relationships are a sacred responsibility to each other and the youth we serve and can only truly be honoured by long-term commitment.

Cultural Connections

Connecting with Community

Understanding Community Expectations & Challenges



Ongoing Learning

Knowledge Mobilization

Walking Together

Each community brings diverse strengths, experiences, and ways of knowing to the forefront as we collaborate to adapt and overcome the realities that are often presented. With the uniqueness of each community, there are some common realities that we work together on to support the students' learning journey.

Realities	Collaborative Approach
Communities display a lack of trust with outside organizations	We have heard from communities that if MindFuel is coming in once for a single workshop, they are not interested. Trust is achieved through the long-term relationship building to understand communities; listening and leaning on the strengths of community and wisdom of Elders, community members and school staff members to collaborate on the development of programs. Deep relationships are solidified during in-person school activities and attendance at community events.
Cultural safety and appropriate content	As a team, we are constantly enhancing their own understanding of Indigenous histories, practices, and protocols through OCAP Principles, TRC Calls to Action, UNDRIP and cultural diversity of the Peoples we work with. Entering communities as a learner, we seek out Elders, Traditional Knowledge Keepers, language speakers and educators to ensure culturally appropriate content is centric.
Decreased school capacity due to high teacher turnover	Many communities experience significant teacher turnover due to remoteness, heavy teaching loads and other factors. We prioritize offering professional learning workshops and mentoring sessions to ensure teachers have the confidence, skills, and resources to support their students' learning journey.
Internet Connectivity	Access to Wi-Fi is improving however some remote areas are still challenged with consistent connectivity. To support this, we provide hands-on activities during in-person visits with bundled resources and materials including offline computational thinking activities for ongoing school use.
Accessibility (materials, resources, external organizations)	As part of our programs, we provide tech and materials (starter kits, DNA Playground, etc.,) to schools and provide connection to our partners through online workshops. The trust we have built with schools allows us to introduce our partners and increase opportunities for communities.
Student readiness (behavioural challenges, low literacy/numeracy, inconsistent attendance, etc.)	Our activities provide learning through hands-on project-based, design-thinking activities which speak to many neurodiverse students who have a unique perspective and experience of the world. Skills are developed faster through trial and error, and verbal communication is enhanced which compensates for low literacy/numeracy skills. In addition, we have developed text resources, materials, and surveys to include diagrams, icons and audio/video instructions that assist students to find success when taking on individual tasks with little help.
Community crisis (fires, floods, personal losses, etc.)	Being flexible whether in-person or online has enabled us to better support communities when they face crisis. We have experienced evacuation alongside community bringing us closer together. Checking in regularly lets them know they are seen and heard and are more than just a program check box. One teacher said, "Thank you for coming back when it gets hard".
Overcoming fears by sharing forward	Students often lack the experience and confidence to share what they have learned. Our model, both in-person and online programs, provides an opportunity (Showcase) for youth to share their projects in a safe and welcoming environment. The notable enhancement of individual communication, leadership, collaboration, and problem-solving skills are exemplified as they present and explain the tech behind their project to peers, educators, and beyond.

Walking Together

In the spirit of walking together the programs and resources are guided by the wisdom of communities and created in collaboration and consultation with community partners.

Ways of Knowing: Science in a Crate 2003 - 2012

Indigenous communities have highly developed scientific systems embedded in their ways of knowing, doing, and being. Honoring, celebrating and sharing this through a two-eyed seeing approach enhances student curiosity. As part of our Ways of Knowing series, these eight crates honour Aboriginal perspectives in the studies of science.

K-6 students engaged in Alberta: +200,000

Ignition Packs (2015-2019)

Development of science resources with teachers for teachers incorporating the Indigenous perspective and practices for the following science units: Grade 5 Wetland Ecosystems and Grade 7 Interactions and Ecosystems distributed to rural schools, including Northland School Division, and Fort McMurray school districts. Kits distributed: 87 Grade 5 Wetland Ecosystems and 44 Grade 7 Interactions and Ecosystems.

Gr 5-7 students engaged in Alberta: 5,980

Wonderville (Digital Program): 2010 - Present

MindFuel's First Nations, Métis, Inuit program on Wonderville.org gives students an opportunity to learn, respect and value different ways of knowing while engaging in active scientific inquiry; skills that are the foundation to the understanding and future success of science. The program engages in the early development of students' interest in science and technology and aspires to influence their future studies or careers in these fields.

K-9 students engaged Worldwide: +3M

Community Programs: 2019 - Present

2019: First all-Indigenous robotics team in Tech Futures Challenge
2021-2022: Professional learning workshops in collaboration with IndigeSTEAM
2021-2024: IndigeSTEAM Summer Camps, annual collaboration
2021-2025: Online teacher professional learning workshops with northern/rural/remote Indigenous schools, annual PL series
2022: Post-COVID all-Indigenous robotics team continuation, in Tech Futures Challenge
2022: Inaugural 1-week STEAM student and teacher workshops in rural/remote Indigenous communities in AB, BC and YT
2022-2025: Virtual tech and STEM student workshops
2023-2025: Northland School Division Student Project Showcases, annual event
June 2023: Student Work Week - grade 12 Indigenous graduates
Nov-Dec. 2023: 2-month internship with Indigenous students
2023-2024: Annual 1-week STEAM student and teacher workshops in rural/remote Indigenous communities
2024-2025: Indigenous student project awarded I3 funding, grant co-application and collaboration
June 2024: STEM Camp for Tsay Keh Dene high school students
May 2025: Aboriginal Youth Career Workshop

K-12 students engaged in Rural/Remote/Northern Communities: 670

Community Programs

Learning Together

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

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

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.

With each community 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.

80%

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

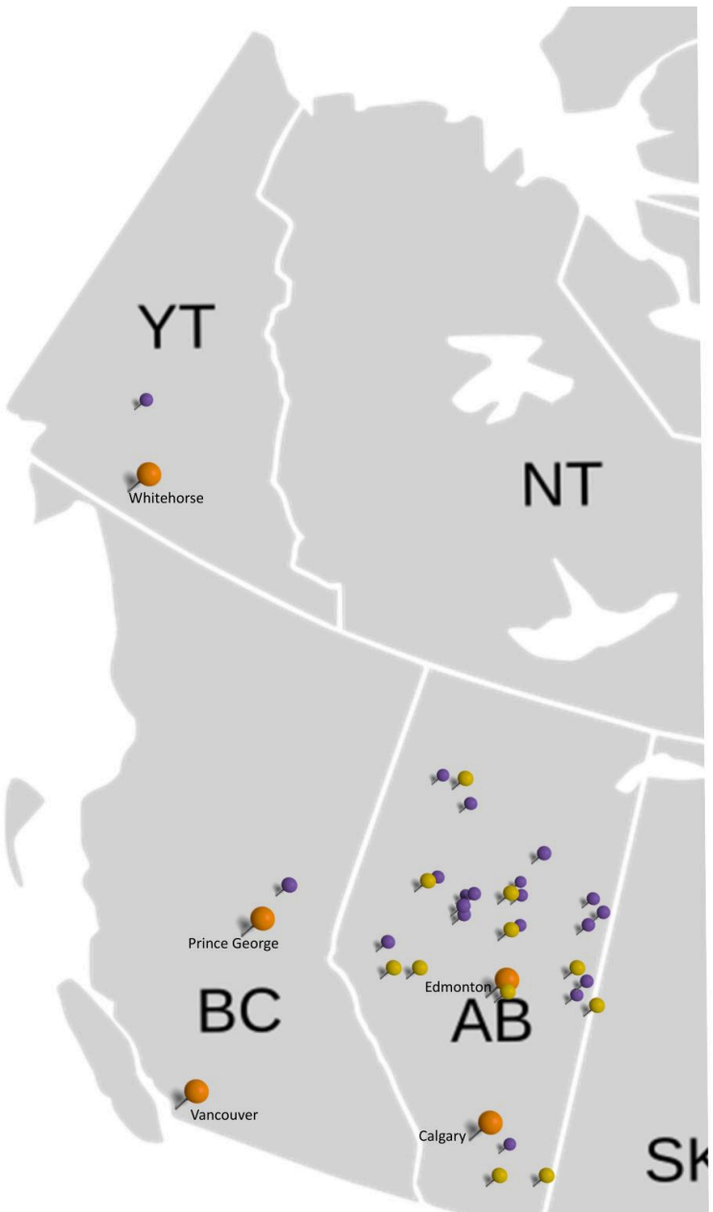
86%

of students stated: "I want to learn more about coding and building circuits."

88%

of teachers stated: "The learnings from this workshop will help me to support youth in building STEM skills relevant to the real-world."

Community Partners



Purple: Tantalus, Tsay Keh Dene, Siksika, Dene Tha' and Northland School Division
Yellow: Friendship Centres

Dene Tha' Community School: Almost 850 km north of Edmonton, AB, (a 9-hour drive) you will find the community of Chateh (700 people), one of three communities of the Dene Nation. The Dene Tha' Community School in Chateh, AB has approximately 150 students K-12 enrolled where traditional Dene culture, language and way of life are foundational to curriculum.

Tsay Keh Dene School: The Tsay Keh Dene Nation is one of the Sekani bands of the Northern Interior of BC, hosting a population of 525 people. An extremely remote community by the Williston Reservoir, it is located a 15-hour drive north from Prince George. We work with the Tsay Keh Dene School which enrolls approximately 60 K-12 students striving for their motto of 'Dream Big, Achieve Big'.

Tantalus Community School: Tantalus Community School: Little Salmon Carmacks First Nation located about 180km north of Whitehorse, YT, on the banks of the Tage Cho (Yukon River), is homeland of the Northern Tutchone people. Tantalus Hats Edan Ku prepares students to become self-sufficient, self-confident and contributing community members reflecting Northern Tutchone values of caring, sharing, and respect. .

Northland School Division: NSD is situated in Treaty 6 and 8 territories, in northern AB, supporting about 1,700 students in 17 schools, across 13 communities. Approximately 95% of the student population is of First Nations, Métis, and Inuit descent. Education is holistic, providing opportunities for student development through all dimensions of self: spiritual, emotional, intellectual, physical, and social. Students are grounded in the values and social relationships within their own individual communities with Elders as an integral component to student success.

Siksika Nation High School: Siksika Nation High School: Part of the Blackfoot Confederacy, Siksika Nation (7,800+ people) located one hour east of Calgary, AB, hosts the Siksika Nation High School (Gr7-12). Their mission is to empower students through inclusive, individualized quality education that promotes Siksika Culture, productive and responsible citizenship, and a life-long learning experience.

Community Partners

Our collaborations with the school communities were strengthened by opportunities to speak and work with Elders and community members, as well as during our journey collaborations and consultation with Indigenous organizations and educators.

Aboriginal Training Services, situated in Edmonton, AB, is a fully indigenous-owned drone training service provider delivering local expertise and support to communities across Canada providing high-quality training and services while upholding the values and principles of First Nation heritage. Our partnership has grown from MindFuel staff training to delivery of drone training in community and collaboration for career events for students.

Alberta Native Friendship Centre Association (ANFCA), is comprised of 20 community-based Friendship Centres (FCs) that collaborated with MindFuel in 2022 to bring coding and digital skills workshops to their individual Centres throughout Alberta. Collaboration exists today.

Amino Labs, located in Lethbridge, AB, a MindFuel Tech Futures Challenge alumnus, has been a long-time partner co-delivering a multitude of student virtual and in-person workshops in genetic engineering and biotechnology, making learning and skill building engaging and accessible to all students. Collaborations include student workshop development and in-person and online delivery, tech resources development, and piloting a biotech program for high school students.

Askenootow STEM Enterprise Inc., residing in Saskatoon, SK, this Indigenous-owed STEM company develops Indigenous STEM lesson activities that includes Indigenous Elders' and Knowledge Keepers; and cultural, linguistic and land based teachings. Askenootow Founder, Dawn Pratt, has provided feedback and evaluation for MindFuel resources, as well has offered her experience as a judge for our Tech Futues Challenge Skills Building Workshop.

IndigeSTEAM, located in Calgary, AB, their mission is the provision of Indigenous-led and culturally-relevant programming in STEM/STEAM to support a better future for Indigenous youth and their communities in STEM. Our partnership ensures spaces that are ethical and respect Indigenous culture and Ways of Knowing. Collaborations include: co-developed teacher PL workshops, IndigeSTEAM team members joining in commuity visits, supporting each other's events, and co-creating STEAM resources.

Johnston Research Inc., from Toronto, ON, provides Indigenous evaluation that meets the needs and priorities of Indigenous Peoples and honours reconciliation in evaluation through a decolonized lens. Johnston Research evaluated MindFuel's program development and delivery model, as well as its knowledge mobilization process, as a third-party evaluator of a Future Skills grant. MindFuel utilizes their Waawiyeyaa Evaluation Tool to capture a qualitative storyboard that incorporates culturally based learning, allowing students to reflect on their project-based journey.

Community Programs

Empowering STEM Innovation Learning & Doing

- Student attendance improved. One school shared they had students who previously had not yet attended school that school year, and they participated in the full week of MindFuel activities.
- Student participation in STEM activities increased, as well as sustained interest and focus.
- Student motivation increased to continue learning & doing, as well as exceeding activity outcomes.
- Teacher supports for learning a new tech and incorporating it into their classroom strengthened.
- Teacher knowledge, skills & confidence in new tech & innovation mindset development increased.
- Project-based learning and the design thinking process works and aligns with Indigenous ways of learning and doing.
- Student understandings of STEM fields & careers heightened.

> *"It made me curious on why it wasn't [working] and then figuring out why it wasn't working and fixing the problem."*
> *~ Student*

> *"Something indecipherable became more easy to understand."*
> *~ Student*

> *"This is the first time I've seen them with their cameras on."*
> *~ Online School Teacher*

Community Programs

> *"There's so much more technology available...that I didn't even know existed before the start of what we've done here...that's just completely changed the direction of how I've used technology. Now it's a tool to help them grow within themselves and show how they know things. It let's them have more of an outlet in different ways."*
>
> ~Teacher *(awareness and insight gained from using the Johnston Research Inc. Waawiyeyaa evaluation tool)*

670
K-12 Indigenous students engaged

17
Rural/remote/northern schools

6
Indigenous Collaboration Partners

108
Student sessions

51
Teacher Workshops

10
Week-long in-person community visits

35
Resources
(7 videos, 27 activities, 1 showcase event)

570 kits, **20** laptops &
195 tech incentives

Sharing Impact

These dynamic, student-centered programs immerse youth in real-world problem-solving, technical skill development and design thinking. By engaging in collaborative challenges, students develop critical innovation skills such as ideation, prototyping, and iterative thinking. These experiences not only build technical and creative confidence but also connect learners to local innovation ecosystems, encouraging them to see themselves as active contributors to their communities and future industries.

Building Stronger Communities

With a combination of in-person and virtual student workshops and events, MindFuel's in-community work continued to grow and strengthen in rural, remote and northern communities, including collaborating with Indigenous communities in BC, AB and YK, including Northland School Division to deliver engaging, hands-on STEM programming to students and teachers. The STEAM-based projects incorporated weaving together storytelling, cultural connections and "tech", and included unplugged computational thinking activities, design challenges, coding, circuit building and text-based coding, with the goal of building youth resiliency in learning and applying new STEM skills.

> ***"I felt super proud making it, step by step, it felt good finishing my project, the first time it worked.***
>
> **~ Grade 8 student – Northland School Division, Coding & Automation participant**

87%

of students stated: "I found using this technology fun."

95%

of teachers agreed: "My students have shown interest in continuing to learn about and using this technology."

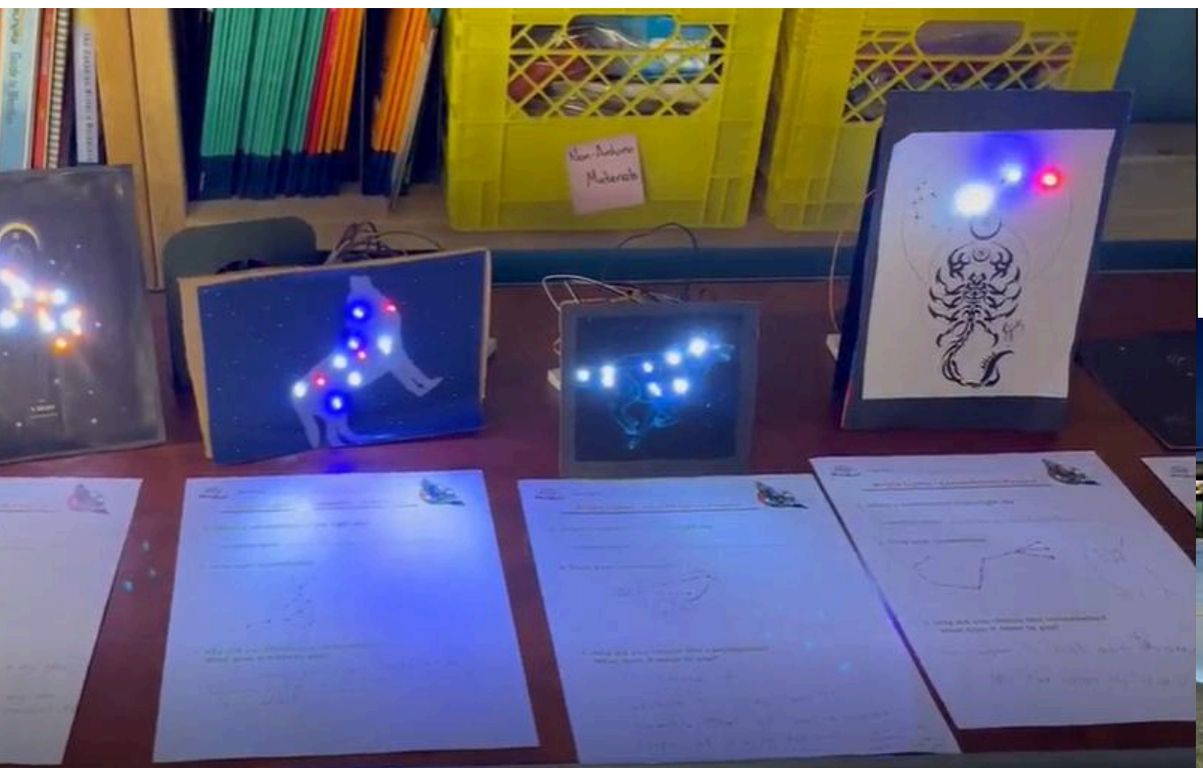
79%

of students stated: "I found using tech, storytelling and art interesting."

Sharing Impact

“They have so many ideas for next year, they also loved seeing the other students projects. It helped with team building and peaked their curiosity in learning about the world around them.”

~ Teacher – Northland School Division



Northland SCHOOL DIVISION

Sharing Impact

From student ideas to reality

Innovation is not a 'one and done' event but a series of scaffolded activities over time where learning greets failure and success with the same enthusiasm and continues to grow until what was impossible at the beginning is finally achieved; it is a living breathing process of curiosity. Continuously showing up to grow long-term trusted partnerships it provides the opportunity to meet youth where they are at and scale programs as youth are ready contributing to student successes.

2019 TFC Project: Building a prosthetic arm controlled directly by the brain by integrating the robotic hand with servo motors & using brain waves collected through an EEG headband.

Student Impact Statements:

- "I believe we can go and take this as a learning experience and compete in other competitions bravely..."
- "It increased my robotics and automation skills a lot and gave me more confidence to present future project." (post-workshop survey by grade 9 students)

2022 Project: Designed and built a solar-powered algae bioreactor to sequester CO2, improve the environment's air quality and offset the impacts of climate change. Automated the growth of algae with sensors and environmental controls and use the algae to create value added byproducts such as biodiesel & pigments.

2023:

- MindFuel provided summer internships to Siksika students to expand their contact with subject matter experts and partners while having employment experience in a work-place setting.
- MindFuel supported a funding application with the I3 (Indigenous Innovation Initiative) for the benefit of Siksika Nation youth and their STEM 'Project Phoenix' - Algae Bioreactor. Funding of $125,000 was secured to: validate product, establish a company, finalize the prototype, build 10 new units, and attract investment. The I3 national review team indicated that Algae Bioreactor proposal was the top choice out of 200+ applications from across Canada as it shows great promise for commercialization potential.

See the 'Project Phoenix' story at: https://www.youtube.com/watch?v=-EBGBsA5u_s

Reflecting on the Siksika youth team journey, it exemplifies the importance of long-term relationships and the commitments & responsibilities that communities, MindFuel and funding partners have to youth since learning, innovation, making meaning of the world, and finding their right path in life is an extended journey rather than a one-year or two-year path.

The Journey Forward

Planned activities:

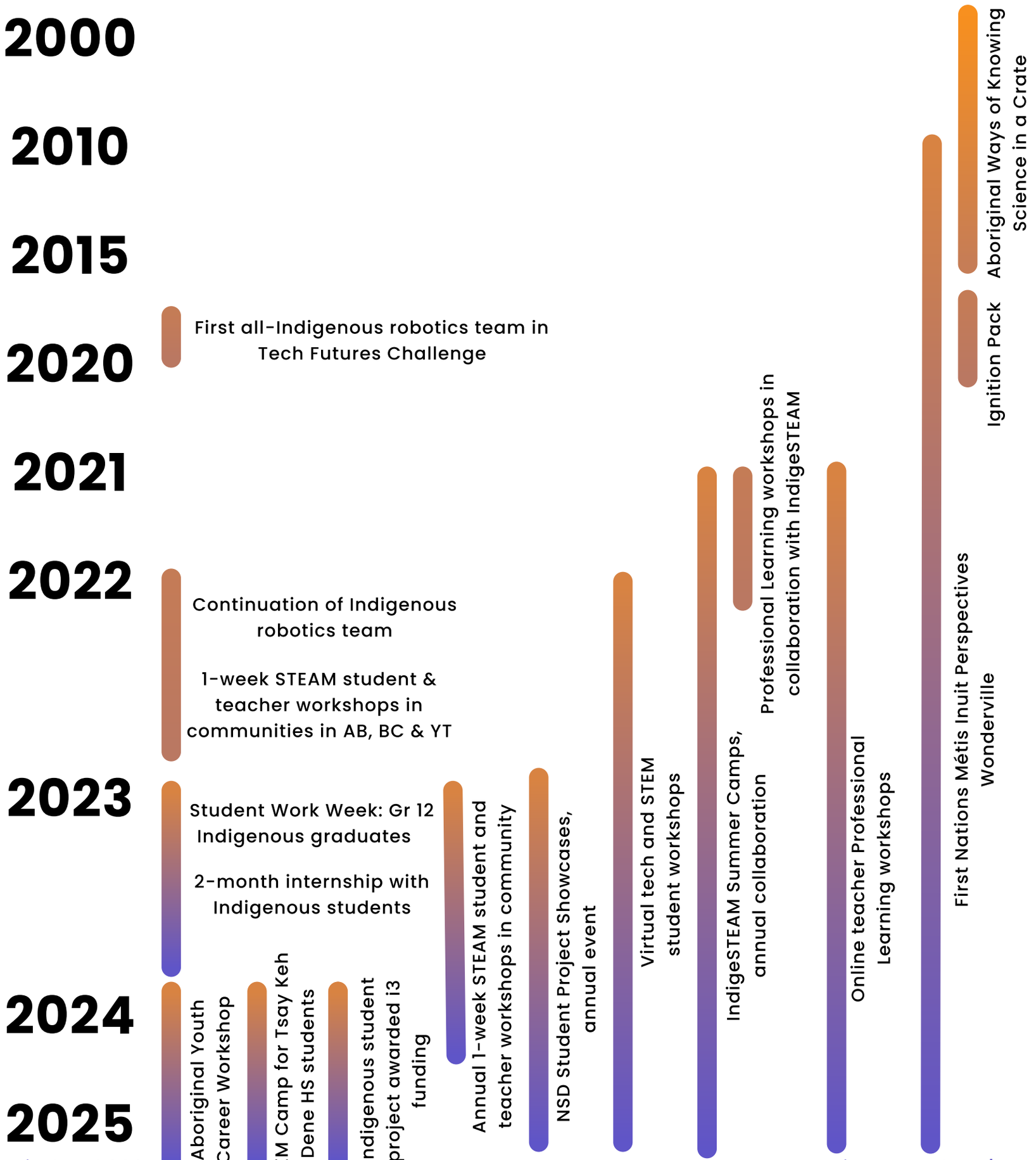
- Fall 2025: Annual 1-week STEAM student and teacher workshops in rural/remote Indigenous communities in AB, BC and YT
- Fall 2025: Aboriginal Youth Career Workshop
- October 2025: CTS Week, Northland School Week
- 2025-2026: Outreach to additional communities
- 2025-2026: Online teacher professional learning workshops with northern/rural/remote Indigenous schools, annual PL series
- 2026: Northland School Division Student Showcase

Vision for continued collaborations:

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

- Co-create & implement a 5-7 year program plan that leads to community self-sustainability of the learning program.
- Co-apply & co-implement grants with funders supporting multi-year dynamic funding and flexible timelines
- Ensure funding includes: cultural components, food, wraparound supports, and professional learning for teachers, communities & MindFuel team, as eligible expenditures
- Provide more paid Student Work Weeks to evolve into full Summer Student Work Programs
- Support pathways to commercialization of Indigenous student projects that create more Indigenous-led businesses, community job creation, and economic growth.

Timeline



MindFuel™

Suite 260, 3512 33 Street NW
Calgary Alberta T2L 2A6

P: 403.220.0077
E: info@mindfuel.ca

Charity registered as The MindFuel Foundation,
formerly the Science Alberta Foundation

Registration Number: 132657065 RR0001