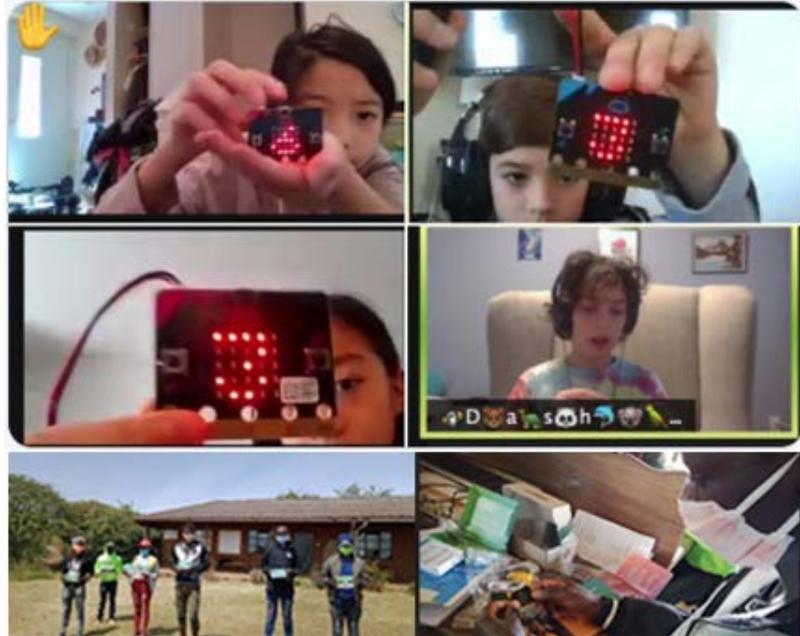




Knowledge Sharing with Kenyan Schools

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School District: Toronto DSB



What We Did

We provided ongoing learning opportunities to leverage technology (computational thinking as one of many models promoting thinking about the world) to support deep learning in the junior grades; engaged students through the design thinking process, posing challenges that will in turn become learning opportunities that focus on the Global Competencies and UN Sustainable Development Goals; fostered a global partnership with schools in a rural community in Kenya; took learning beyond our class walls, building digital citizenship and responsibility focusing on youth service. We are continuing to teach computational thinking as one of many ways of understanding that can enhance and complement other types of knowledge, including indigenous ways of knowing by taking learning outdoors, being on the land and learning from the land.



What We Learned

- Coding can be learned by anyone even with limited resources.
- Students gravitate towards open-endedness of coding.
- Adapting program with coding tools can foster engagement during changes to school delivery model.
- Growth over time in understanding coding concepts (sequencing, nesting, etc).
- Learning value of testing, receiving feedback and making iterations or debugging code.
- Using the inquiry model to guide research to build understanding of the UNSDGs.
- Using the design thinking process to guide students in concept design and sharing their final coding projects.
- Providing students with culturally relevant technological artifacts to build can enhance student engagement and lead to deeper learning.
- Learners can gain design thinking skills through the iterative process of coding.



How We Shared Our Learning With Others

- Social media
<https://twitter.com/Sebasualto>
<https://twitter.com/ZeliaMCT>
- Lewa Annual Stakeholder Report
<https://indd.adobe.com/view/17bd6bba-1b27-406a-858c-e3f346922887>
- Will be submitting a proposal to upcoming conferences (TDSB Unleashing Learning)
- Will be submitting a proposal to KidsCodeJeunesse virtual summer camp



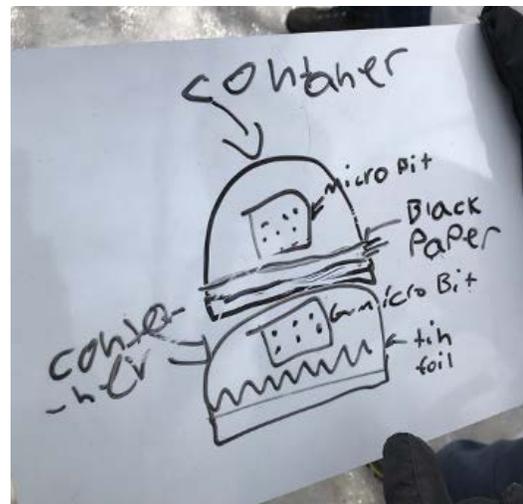
Links to Our Work

<https://twitter.com/Sebasualto>

- Headbands Microbit <https://twitter.com/Sebasualto/status/1362139804947873795>
- Lynx <https://twitter.com/Sebasualto/status/1337431707335725056>
- Remote Learning Micro:bits: Roll the Die <https://twitter.com/Sebasualto/status/1359905515040632838>
- Virtual workshop <https://twitter.com/Sebasualto/status/1359850302963412993>
- Coding and the Outdoors <https://twitter.com/Sebasualto/status/1367234615522525188>
- Girls Who Game: MinecraftEDU & Coding video winners
<https://twitter.com/ZeliaMCT/status/1355181996570456070>
- Secondary students in Kenya <https://twitter.com/MrBasualto/status/1291459426050875392>
<https://twitter.com/MrBasualto/status/1288147859603443712>
- Girls Who Game: Eatery Of The Future Canadian winners <https://flipgrid.com/s/qRsp1PMs9sCUKrBD>



Students coded their Micro:bits using MakeCode before we headed to the ravine.

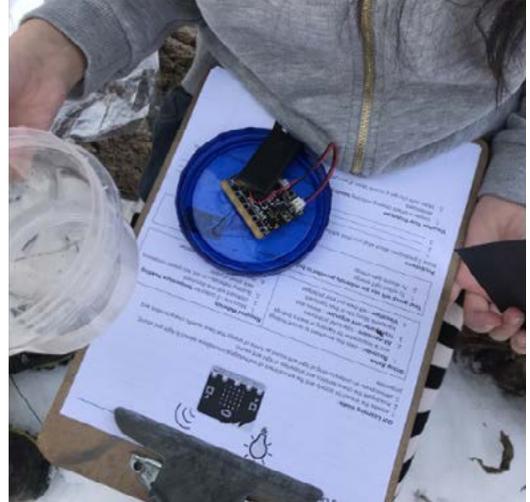


Before building their prototype students draw up a plan for what their device will look like.

Links to Our Work (continued)



Student track their temperature readings using a graphic organizer.



Students in Grade 4 use the Micro:bit's temperature sensor to test how light energy is absorbed or reflected.



Using the Design Thinking process students began to consult with their local community and are developing ideas to address water scarcity.

Their idea involves building an irrigation system on school grounds that will collect water for the school community. Using the design thinking process, students will consult with leaders in the water harvesting system.



Students in Kenya used the Climate Action Kits and Micro:bits to build prototypes of an irrigation system and reforestation robot.

Student Quote:

"My favourite colour is cyan. I like to sleep, but I get up at 5:00 - 6:30 to code. Coding is instructions you give to the computer to do almost anything you want. Here is the link to my best game." - Ohaliav, Grade 4



Links to Our Work (continued)

https://makecode.com/_5Wb48J2sDTHw

In class virtual workshops

- Kid Code Jeunesse, microbit introduction while remote learning about LED display and looking at sequencing, concurrent, repeating and nested events, as well as conditions and controls in code.

Follow up activities after coding in class

- temperature gauge that was tested at Cedarvale Park and results recorded that were analyzed back at school
- using the microbit to practice our multiplication, patterns would shake their coded microbit and as numbers (1-9) appeared they would multiply
- designed headbandz and coded the Micro:bit for game play to build class community
- coded microbit to explore the radio signal option, whereby one was hidden and another would search it out by looking at the display where the LEDs would use directional arrows towards the hidden microbit
- we are beginning to explore the climate action kits as part of an inquiry project in partnership with another junior class
- as students continued to explore and code in MakeCode, they have demonstrated how to transfer those skills into other platforms like Minecraft Education Edition and Arcade.MakeCode. This was highlighted as our members of Girls Who Game were able to build upon their designs by coding. There were 21 girls from a Grade 4 and Grade 6 class taking part in an inquiry based challenge looking at the UNSDGs, Design Thinking and Coding who were later divided into 3 teams to focus on a local or global community in designing an eatery of the future. Team 1 eatery of the future focused on supporting an Indigenous community, Team 2 eatery of the future focused on supporting a community in Kenya, and Team 3 eatery of the future focused on supporting a local neighbourhood in Toronto.

Students documented their learning using paper/pencil tasks while in the field, using graphic organizers in Google Slides as well as submitting written reflections and video reflections on Flipgrid.

How students are meeting ISTE standards

<https://www.iste.org/standards/for-students>

- Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
- Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
- Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
- Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

Introduction to LYNX coding using the print cards to guide activities

- Exploring with a partnering Grade 4/5 class
- Unfortunately interrupted by school closure this winter
- Access to devices became more challenging
- Continuing while remote learning presented its own challenges due to scheduling and access to devices in the home



Links to Our Work (continued)

Professional Development

- Computational Thinking
- Transferable Skills / Global Competencies
- ISTE standards TEACHERS <https://www.iste.org/standards/for-educators>
- Professional resources were used to inform teaching practice and pedagogy
- Attending the March Coding Camp to Learn LYNX for further training and building repertoire to support class activities for the remainder of the school year
- Attended additional 3-part workshops hosted by InkSmith looking at coding and the UNSDGs

Professional Resources:

- Mindstorms by Seymour Papert
- Invent to Learn by Gary
- IQ: A Practical Guide to Inquiry-Based Learning by Jill Coyle / Jennifer Watt
- Closing the Gap, Thomas, Sarah
- Strategies that Work, 3rd Edition- Harvey, Stephanie
- Perceptrons: An Introduction to Computational Geometry- Minsky, Marvin
- Seven Sacred Teachings: Niizhwaaswi Gagiikwewin - Bouchard, David