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Fear Not the Robot

25th ANNIVERSARY

FEATURES

TECH AND READING
TAKING STEM OUTSIDE

COLUMNS

WEBSTUFF: MUSIC APPS
FIELD TRIPS: CODING

CLASSROOM PERSPECTIVES:
HIGH SCHOOL MUSICALS

TEACH
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Technology in education can be an enabler and a disabler as we discover in two of the three feature articles in this spring issue of TEACH Magazine.

In our first **Feature Story** by Martha Beach, we discover that technology, when introduced too early or when a child isn't ready, may have a detrimental impact on reading comprehension and ability. Even when students understand how to decode language and have been schooled in phonics, for example. Yet there is also much evidence to support a range of technological tools and apps that aid students in their reading, taking away the anxiety of a disability such as dyslexia so they can focus solely on meaning and comprehension. Enthusiastic reading on a tablet might not transfer over to print books. Tablets provide an interactive, stimulating reading experience that some children may not be able to replicate when looking at a book. Ultimately, the proper combination of technology and more traditional reading will put children on the path to literacy.

Competition and robotics have been operating in some schools for quite a while now. But the excitement of competing against other schools in skills events and the sense of accomplishment, remains extremely gratifying. Robotics represents hands-on, immersive learning that yields cross-curricular outcomes. Take a look at our second **Feature Story** by Meagan Gillmore on the topic and witness the passion of teachers and students working together. And in a complementary piece, Adam Stone writes about taking STEM out of the classroom and having students work with field-based practitioners of science to deliver real-world experiences that make a profound impact.

Finally, in **Classroom Perspectives**, we have an article that explores the staging of musicals and how such a hands-on activity can yield cross-curricular outcomes and learning opportunities. Keith Mason is a high school teacher in New Jersey, a musical enthusiast, and developer of study guides that integrate the show being performed by his school with curriculum outcomes. The results have been award-winning.

As key elections in Canada and the United States appear on the horizon, **CURRICULA** explores the question of Why Vote? Why is it important for every eligible citizen to exercise that hard fought and won franchise secured by women after a long, arduous struggle. This question goes to the heart of our democratic system of government. Explore with your class, why indeed, everyone of voting age should get out and exercise that right.

Please check out our latest resources:
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Suffrage: Canadian Women and the Vote (***www.canadiansuffrage.com***),
The Road to Confederation (***www.roadtoconfederation.com***) and
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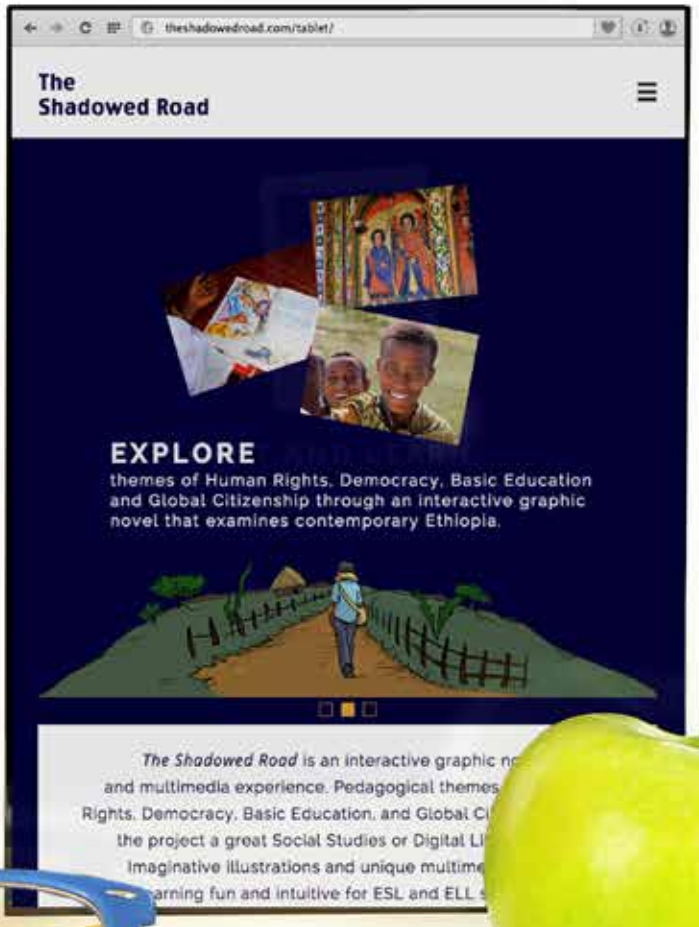

Brought to you by TEACH Magazine

TAKING STEM OUTSIDE THE CLASSROOM

by Adam Stone

A survey by the National Association of Independent Schools found that 82 percent of high school students are sometimes or often bored in class. Todd Ablett has a simple solution: Get them out of the classroom—and into the workshop.

As the chief robotics instructor at West Vancouver Secondary School, he enters a student team each year in the VEX Robotics World Championship. This year his kids finished fifth out of 15,000 competing teams. Through competition, "the kids get to become real experts at something. They take their programming and building to a very high level," he said.

Across the K-12 spectrum, STEM educators are looking for ways to take science out of the classroom and make it come alive. In addition to robotics competitions, they are partnering with the industry, teaming with universities and seeking a range of other creative ways to make STEM more than just a textbook exercise.

LOCAL LANDSCAPE

As head of the science research program at Lincoln High School in Yonkers, NY, Dean Saghafi works in partnership with the Sarah Lawrence College Center for the Urban River at Beczak to give kids first-hand scientific encounters with the Hudson River—a ubiquitous feature of the local landscape.

"My students have to come up with their own original projects, and they will use the university's equipment to measure conductivity, salinity, dissolved oxygen, pH and water quality," he said.

By leveraging the university's sophisticated hydrometers, spectroscopy equipment and other high-end laboratory assets, Saghafi is able to take kids beyond the basic classroom understanding.

"The hands-on activity really fosters their interest. Seeing it live instead of just seeing a lot of numbers on the internet, that really brings it to life," he said. "By doing it themselves, the can see what it means to get the numbers, to

incorporate their chemistry knowledge with their research skills, so it ends up being an interdisciplinary thing."

In a separate project, Saghafi teams his kids with biology researchers at the Sloan Kettering Cancer Center, as well as epidemiologists through the Sophie Davis School Biomedical Education Program—a weekly biomed program of experiential learning. "The key to bringing STEM out of the classroom is definitely having universities and research institutions that are willing to take the kids and give them research opportunities," he said.

TAPPING SAP

The natural environment forms an intuitive jumping-off point for many STEM teachers looking to take scientific inquiry beyond the textbook level.

Just as the Yonkers kids investigate the Hudson River—a pervasive feature of the local landscape—Maya Crosby takes her students out to tap maple sap.

As STEM director of the Allendale Columbia School in Rochester, NY, she leads an annual maple sugaring experiment that combines concepts of agronomy and chemistry to produce over 60 bottles of syrup a year.

"They harvest sap, they render it and they sell it. During the project they learn about the science of syrup production and about food production," she said. "It has quite a bit of botany, we discuss plant science and why its maple trees produce this sugary substance. There is chemistry involved in turning the sap into syrup. It touches on the kinds of science and quality control you have to take into account when you produce something for a person to ingest. That's a growing area of STEM."

Crosby also connects with local industry and higher education in the quest to expose students to "real-world" science. With companies like Kodak and Xerox as longtime local residents, the area is rich with optics and imaging science opportunities.

Partnering with the local community college and university researchers, she has found opportunities to engage students with controllable LEDs, 3D-image projectors and other technologies that would ordinarily be out of reach. "They get into it at a level that is pretty amazing for lower-level students," she said.

'CURIOSITY CUBE'

A 7th Grade science teacher at Marshall Simonds Middle School in Boston, MA, Tammy Scelsi took her students out of the classroom and into a giant box.

Actually, it's a 22x10-foot shipping container, dubbed the Curiosity Cube. Life science company, Millipore Sigma developed it and makes it available for free to educators. It's a mobile lab packed with hands-on learning opportunities and staffed by experts.

"There's a 3D printing station where they were printing pieces for a robotics assembly. There is gestural interface technology where kids can take apart a skeletal image of a skull and look at the brain, just by waving their hands in the air. And they had some microscopy, looking at cancerous brain cells and healthy brain cells," Scelsi said.

Best of all, students get to extract DNA from their own saliva. "If you're a 7th Grader, you're doing science and you're spitting. So it's just great," she said.

Most exciting to Scelsi was the chance to see her students interacting with the industry experts. "These are people who actually work in science, who can talk about possible career paths. So at age 12 or 13 these kids can start thinking: Here's a direction I could go in my life. We don't often get a chance to bring in professionals from the outside," she said.

COMMUNITY TIES

While some look to nature or the industry for ways to connect the dots between science and real life, others

There's no one right way to move science and technology beyond the classroom. Institutional partnerships, field trips, competitions—all offer avenues through which students may be invited to put aside their textbooks and roll up their sleeves.

take a different approach, using classroom science as the jumping-off point to connect with and even enhance their local communities.

Jaleesa Trapp is a former high school computer science teacher and currently a student and research assistant at the MIT Media Lab in Cambridge, MA. In her previous work as coordinator at The Clubhouse Network in Tacoma, WA, she led her students on an investigation of the local emergency call system, applying scientific inquiry to a specific social end.

Students met with 911 operators and learned that lines are often backed up with non-emergency calls. Then they set out to design an app that allows people to report emergencies without tying up the phone lines.

The project succeeded because it grew out of authentic student interest. "This project allowed students to combine the technical skills they acquired with what they care about in the community. It was important to have student buy-in, and allow them to tell me their interests, instead of telling them what they're interested in. It also allowed them to find other students in the class who shared their interests," she said.

The effort took students well beyond the classroom. In addition to emergency operators, they spoke to people experiencing homelessness, youth program directors and a range of others in their search for a problem to solve.

Some might wonder about the legal and logistical hurdles around these kinds of activities, and in fact STEM teachers who have ventured beyond the classroom say these can be stumbling blocks.

"There are safety concerns, legalities around meeting with kids after school or on weekends. There are also contractual issues around how I can use my time and those can become a limiting factor," Saghafi said.

Most often the key to surmounting such hurdles lies in having a sympathetic administration. "I'm lucky. My principal and the public schools are very nice to us: If I say I want to take the kids out to measure water samples, I get support for that," Saghafi said. "You need to have an administration that is amenable to that kind of stuff."

ONLINE TOOLS

For those looking to take STEM beyond the classroom, there are a range of online resources available.

- In addition to lesson plans and classroom activities, *eGIF Dream Up the Future* offers links to a range of outreach programs from universities, corporations, museums and government agencies.

- The *Teach Engineering* site offers lesson plans as well as "Maker Challenges" meant to encourage experiential learning across a range of STEM topics.

- From Lego to slime, teachers will find ways to help younger learners get their hands dirty at ***https://littlebinsforlittlehands.com/outdoor-stem-activities-science-kids/***.

- Got an idea for a way to take STEM outside the classroom? *The Science Everywhere* campaign can help to fund your project.

There's no one right way to move science and technology beyond the classroom. Institutional partnerships, field trips, competitions—all offer avenues through which students may be invited to put aside their textbooks and roll up their sleeves.

At West Vancouver Secondary School, Todd Ablett has one main rule he likes to follow as his students cobble together their robot creations: Stay out of the way.

"I advise and mentor and coach, but at the end of the day it is their design and they run forward with it. The hardest thing I have to do is to put my hands in my pockets," he said. "They may discover that after a month or two that they have gone down the wrong path, but that can be a powerful learning moment, the moment when they ask: Now what do we do? In STEM, you have to learn to be fearless about your failures."

A seasoned journalist with 20+ years' experience, Adam Stone covers education, technology, government and the military, along with diverse other topics.

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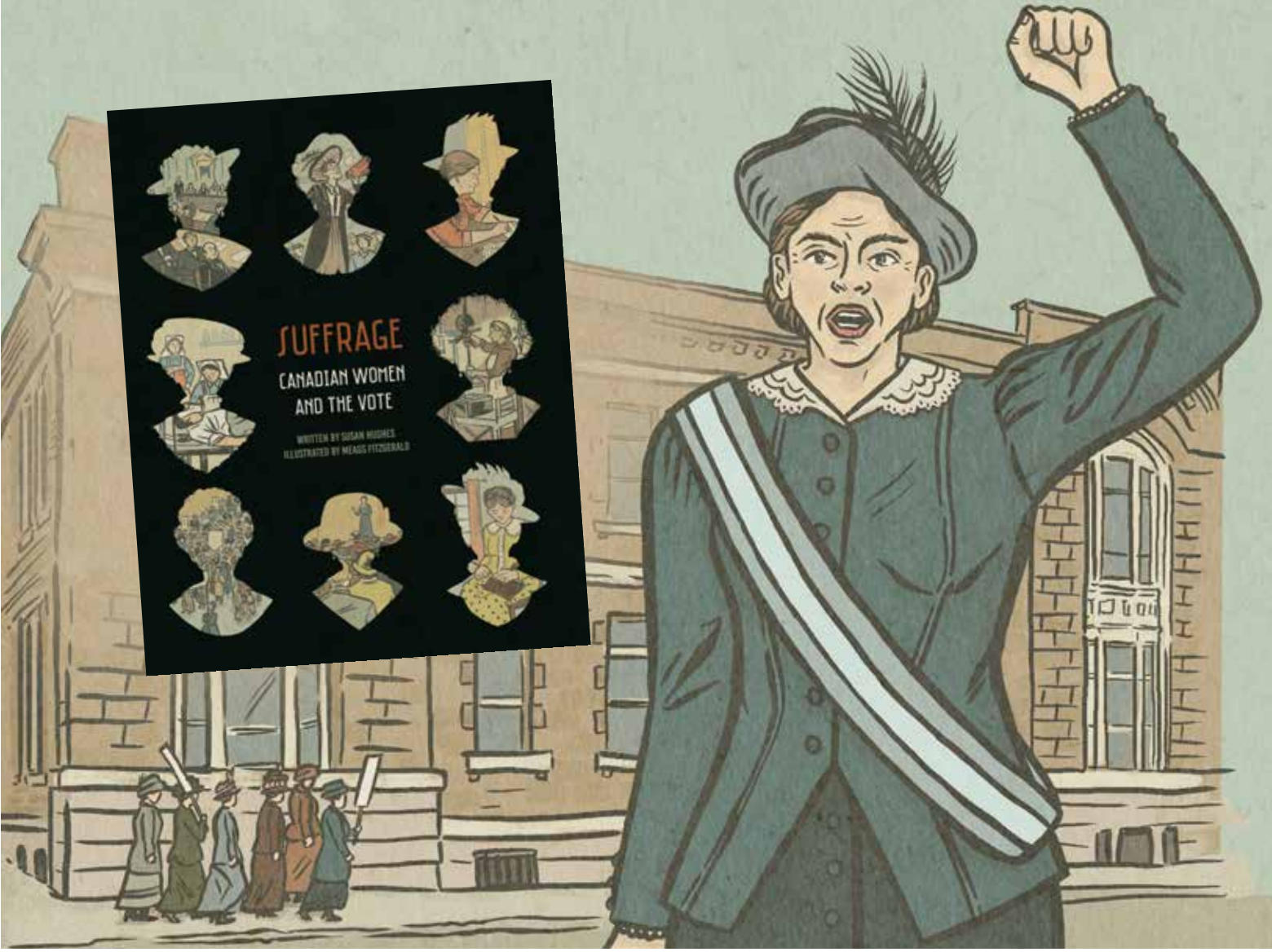

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HIGH SCHOOL MUSICALS

by Keith Mason, Ph.D.

My appreciation of musicals started with *The Sound of Music* soundtrack. As a child, I listened to the entire album. I branched out to other musicals discovering they comprised a favorite form of entertainment both on stage and screen. I realized musicals had much to offer instructionally and thus, bridged a favorite pastime with my professional life. Musicals form an important part of the arts, serving as powerful resources for student learning, engagement, and motivation.

When I approached the school's musical directors to see how I could participate in the spring musical, I never knew how career changing it would become. I learned our school was participating in a New Jersey high school musical competition, the Rising Star Awards, with our local theatre, The Paper Mill Playhouse in Millburn. I was tasked with bridging the school musical, *Carousel*, with our high school curriculum and state standards, and build a lobby display. I created a study guide for teachers wishing to do lessons. The study guide provides a history of each musical, characters, plot, songs in the score, concepts for thematic, subject-specific and interdisciplinary learning, activities and resources. I assigned students in my advanced Spanish class to create song translations and ink drawings tied to the *Carousel* score. Students in French class were asked to create a show program. The lobby display was created under my direction of a carnival scene inspired by the Rodgers and Hammerstein musical with a 24-foot-long mural of carnival amusements in tempera paint, calliope music, and a ticket booth. Teacher chaperones dressed up with boater hats and bright red ties. Projects were placed on display to coincide with performances for audience members to see. Response was enthusiastic.

The night of the Rising Star Awards arrived a few months later. I received the Educational Impact award judged on the support materials I submitted showcasing students' art work, projects, and the *Carousel* study guide.

I kept on with the musical integration program and

Dr. Keith Mason in a publicity photo for a school production of *Hello, Dolly!* with Victorian Ocean Grove, New Jersey, in the background.

it grew bigger. We staged *Bye Bye Birdie*, *The Boys from Syracuse*, *The Music Man*, *Hello, Dolly!*, *Anything Goes*, *Into the Woods*, and *The Boy Friend*. Faculty participated voluntarily. More teachers and students became involved in their regular classes across subjects, including world languages, language arts, video production, visual art, culinary arts, social studies, and science. For the remaining seven show integrations, we received the Educational Impact award at the Rising Star Awards ceremony. It seems we were doing something right. The combination

> **… encourage them to tap into their creativity and learning strengths while aligning to curriculum standards.**

of student activities and projects in regular classes and co-curricular lobby and cafeteria displays focusing on the visual arts, became a highlight of the academic year. It was wonderful to witness students not in the musical production complete projects and artwork inspired by

the themes and music of the school productions. The displays came to life and audience members enjoyed and complimented our work.

Projects were designed to accommodate students' learning styles, Multiple Intelligences, curriculum standards, thematic learning, and cooperative learning. Themes and songs found in musicals helped teachers devise activities and projects and were a regular part of the integration.

Projects included: cameo jewelry drawings and stain-glassed window drawings with cast members' likenesses linked with text in Italian, show programs, paper dolls of cast members in period costumes, musical-themed quilts, a Red Riding Hood cloak tied to Into the Woods with Italian text, a Reno Sweeney scarf for *Anything Goes* with Italian text, and the history of musical instruments with cast members photographed with the instruments, among many others. All of these lessons brought excitement to the general student population. Students applauded when they saw completed quilt projects, sang along or tapped their feet to show tunes, and worked closely with classmates to create the most artistic projects they could produce. Students often proudly pointed out their projects in displays to parents and classmates during performance intermissions.

An interdisciplinary quilt for a school production of The Music Man completed by an Italian class.

When the musicals initiative began to filter outside of our school walls, I knew we could influence teachers at other schools. I wrote magazine articles for educational publications about musicals across the curriculum as well as tributes to musicals staged thirty plus years earlier. I also published composer tributes to Meredith Willson, Richard Rodgers, and Rodgers and Hammerstein, with an article marking Leonard Bernstein's birth centennial scheduled for August 2018.

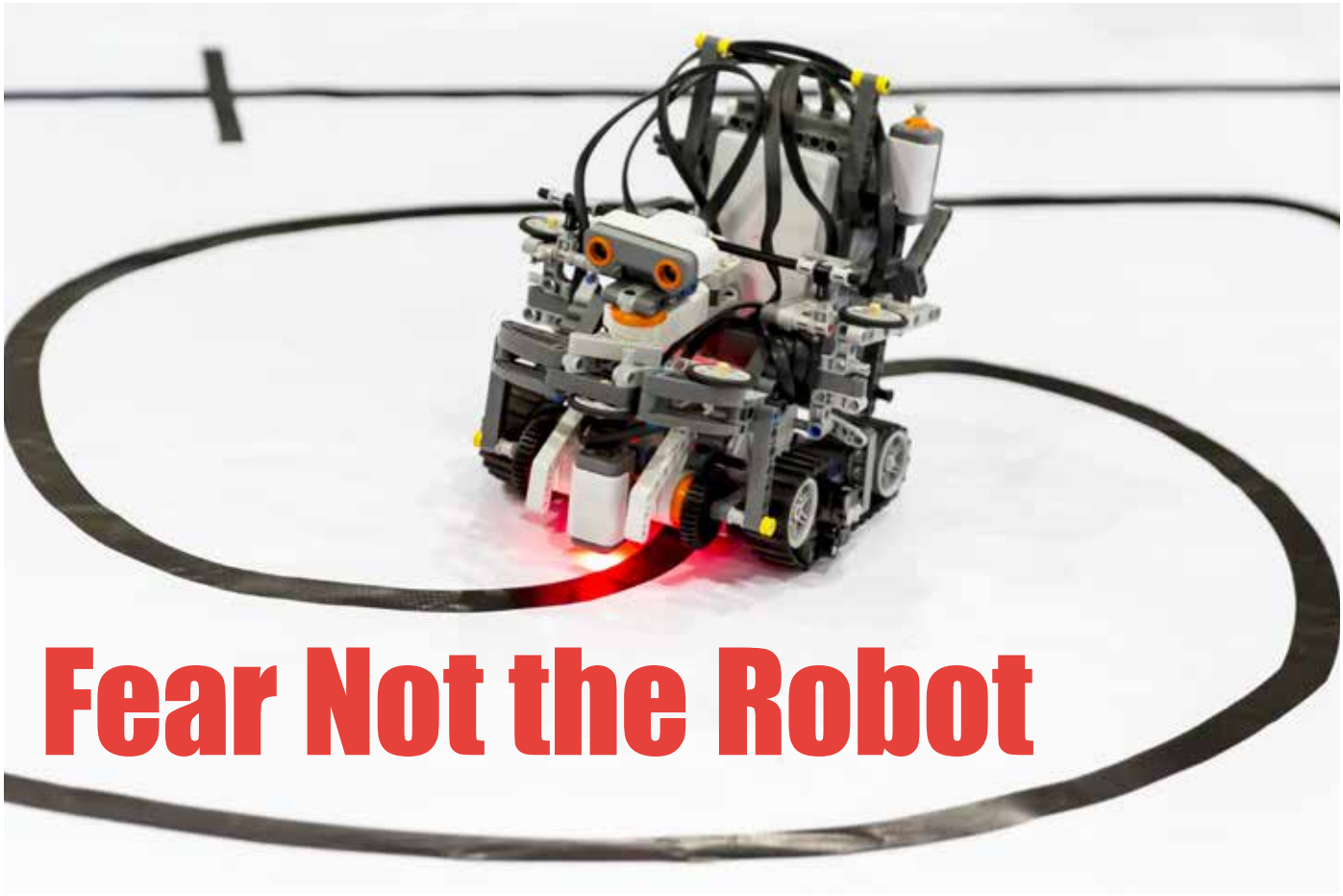
Realizing that all this holds so much potential in student learning, I have explored curricular frameworks to see how they support musicals for learning. I have written subject-specific articles bridging musicals with language arts, world languages, social studies and visual arts. I am also currently writing a book-length description about musicals across the curriculum.

Materials for supplies and artwork are now part of the musicals budgeting process. Having applied for grants through a county arts council, we increased funding for three musicals. Our school was awarded two certificates of recognition for contributions to the arts by the arts council.

Educators who wish to integrate musicals should start small, build upon early attempts with subsequent student groups, develop study guides, and innovate with thematic activities and projects. I also recommend exposing students to musicals through audio and video clips and encourage them to tap into their creativity and learning strengths while aligning to curriculum standards.

The musical integrations supported the faculty involved in staging as well as the casts and crews of our school musicals. The resulting musical class projects were satisfying and rewarding because students exerted effort in their completion and enjoyed having their work placed on public display. Students shone through this exposure to musicals, some becoming big fans of the genre, learning both content material and musicals simultaneously. We are ready for an encore.

Keith Mason, Ph.D. is a researcher and educator based in New Jersey who specializes in language education, curriculum, phonetics, Romance linguistics and musicals in the curriculum.



Fear Not the Robot

by Meagan Gillmore

When Tina O'Keeffe was asked to start a FIRST Robotics Club at Esquimalt High School in Victoria, BC, the former computer technician automatically knew her response: No.

Computers have been her passion since childhood, but she didn't think she had time for another extracurricular commitment. FIRST Robotics teams build robots for competitions. They need to make the parts and fundraise; O'Keeffe compares it to preparing a basketball team for tournaments.

She knew one of her students "lives, eats, breathes, sleeps" technology and engineering and really wanted to do the program. She gave him one afternoon to find other students interested in the club. He came back with eight names. Once she saw the interest, she knew she needed to start something. When they presented the idea to the whole school, more than 30 students showed interest. Only 18 decided to join the club, captained by the student O'Keeffe sent to recruit others. The club began in January and finished constructing its robot, named Spike, by the end of February.

"It's been quite the ride," says O'Keeffe. She estimates it took about 60 hours—including some weekends and evenings—to create the 120-pound robot. Her commitment has just begun. She wants to take Spike to elementary and middle schools and introduce younger students to robotics. She could teach them someday: she's developing a full robotics course she'll be teaching for the first time this September.

… as automation impacts more parts of society and transforms the labour market, many argue learning robotics and coding is as important as literacy and numeracy.

Robots aren't just hobbies for students tinkering in basements or garages anymore. Many schools start robotics classes after seeing how popular the clubs are. This may make teachers nervous. Teaching a course requires more time and resources than running a club. But as automation impacts more parts of society and transforms the labour market, many argue learning robotics and coding is as important as literacy and numeracy.

"Technology is such a big part of education these days," says Jonathan Kaiswatum, principal at Cowessess Community Education Centre in Cowessess, SK, east of Regina. The school started offering weekly robotics classes this year for Grades 5 through 7 students as part of the RoboYOU program funded by Innovation Saskatchewan. Schools need to prepare

students to be good digital citizens, he said.

"This is the future, and the future is now," says Kevin Chiasson, a shop teacher at Minahik Waskahigan High School in Pinehouse Lake, SK. A carpenter by trade, he used to teach in Yorkton, SK, where for almost a decade he took robotics teams to Skills Canada competitions. His teams became national champions and competed internationally.

Curriculum needs to include more practical, hands-on skills, says Chiasson. He is a member of the Skills Canada Saskatchewan technical committee. Robotics engages students more than anything he's ever taught.

Teachers need the right materials, and most importantly, the right mindset, to teach robotics well.

Teachers must pick robotics materials wisely. Many companies make kits to teach robotics: LEGO Mindstorms, Sphero and EZ-Robot are a few. Kits can be pricey, especially if they require purchasing tablets or other devices to run the programs, but not everything is expensive. Chiasson says his first robotics club used materials they gathered from junkyards. As the club grew, they were able to get community donations. This is his first year teaching in Pinehouse Lake, and the club he's starting there is using his personal supplies.

"Hardware is available anywhere," says Matteo Hee, a teacher at Bellerose Composite High School in St. Albert, AB. He recommends teachers learn how to work with something simple first. Right now, he likes using the Hummingbird Robotics Kit, partly because it uses a program similar to Scratch, a block coding program many teachers already use. Hee encourages teachers to look for materials that come with professional tutorials that explain how the kits work. Once teachers and students are comfortable with one kit, they can begin using another.

Preparing to teach students takes time. Students are most likely to ask the teacher questions when they don't understand something, or what they're doing isn't working properly, says Hee, who has also given professional development sessions about teaching robotics. Teachers need to prepare for common mistakes, like not connecting parts properly. They also need to be ready to work with different programs and computer systems.

The most important resource teachers have is people. It takes a team to build a robot, and it also takes a team to create a robotics course. When Chiasson first became interested in teaching robotics he didn't even know how to program a radio. What he did know to do was ask other teachers questions. His queries were "endless," he says: he wanted to know about different motors, controllers and receivers.

The biggest challenge many students face is taking concepts out of their heads and turning them into physical objects.

Teachers can—and should—learn from their students. The key to successful teaching is "giving up the idea that you are the expert and you know absolutely everything," Hee says. Robotics is part of students' everyday lives; many have probably built more robots than their teachers. Students may help their teachers. When Tina O'Keeffe's students were finishing building their robot Spike, they didn't have the nut they needed to use with their lead screw. The team captain had to break the news to O'Keeffe. Before she could panic, he told her he'd already solved the problem: he'd designed the nut on a 3D printer and printed it out. It was "ingenuity at its finest," O'Keeffe says.

Not all students are experts. Hee says he makes sure to review even basic skills, like opening computer programs to run the applications. But teachers shouldn't worry the range of skills will hamper learning. Karl Nicolas runs robotic clubs for children up to age 12 at the Toronto Public Library. The program is extremely popular, and it can be hard to make sure every child gets time with the robots. He has seen more experienced students teach others about what they know so they can do better. Teachers don't need to always separate students based on their skill levels, he says.

The biggest challenge many students face is taking concepts out of their heads and turning them into physical objects. Chiasson says curriculum that doesn't emphasize

hands-on application contributes to this problem. It's another reason he says teachers need to be familiar with the robotics tools they're using. They need to show students how things work. "We have a lot of people who can repeat (information) and mimic," he says. Robotics allows students to apply what they've learned and creatively solve problems. Different students approach similar problems in various ways.

Robotics can bring abstract STEM concepts to life. "They can physically see what they're doing on the screen having an impact on the robot," says Nicolas. "They light up every time they see that kind of connection."

Ann Poochareon is co-founder of Little Robot Friends. It is a Toronto-based company that makes small robots children

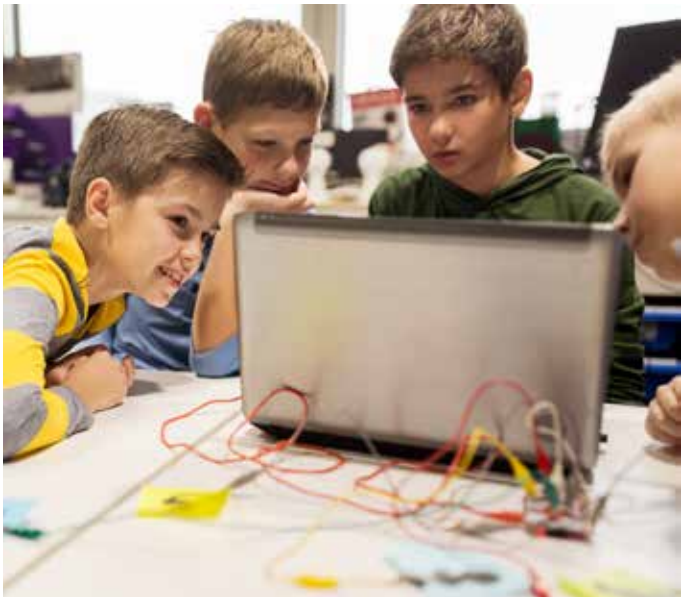
Robotics connects students to people—whether in different grades, or different countries.

can program to express emotions when they're touched. The robots can't run away, and students turn their robots into characters. Robots respond to different touches, so students learn about empathy while programming them. The company recently started camps for children and is making resources educators can use. They emphasize creativity and technology: children make circuit boards or mazes; before programming robots to sing, they learn about frequencies and Theremin.

"Not everything happens in the computer," she says. "Things that happen in the computer can come outside and affect something that's around you. It's an interesting world that we've constructed around learning on the computer, because a lot of times things get stuck on the screen."

Robotics connects students to people—whether in different grades, or different countries. Sarah Sils started teaching after a career in telecommunications, largely to encourage more women to pursue careers in technology. She helps run the FIRST Robotics team at St. Mildred's-Lightbourn School, an independent all-girls school in Oakville, ON. SWAT 771, which stands for "St. Mildred's Women Advancing Technology," has won awards at world competitions. They name their robots "Mildread"—a play on the school's name that reminds other competitors their robots should be feared. In 2017, they signed an online petition when an all-girls robotics team from Afghanistan was originally denied entry to compete at a FIRST Robotics Competition in the United States.

"We felt this affinity," Sils says of the team's reaction. "How dare they ban such a noble cause? This is not OK!" The Afghan team, called the Afghan Dreamers, was eventually allowed to compete in the United States. Students at St.



Mildred's have maintained the connection. The Afghan Dreamers came to Ontario in January. SWAT 771 has helped them build their robots; the Afghan girls weren't as familiar with all the tools SWAT 771 uses. Some of the Afghan Dreamers visited Parliament Hill where Prime Minister Justin Trudeau drove their robot in the Parliamentary Library. Sils, the only SWAT representative there, says the Prime Minister was as excited as a child at Christmas. He "looked like a young kid driving that robot."

The two teams competed separately across Ontario in March, but Sils hopes their relationship lasts beyond this year.

"Hopefully (they'll) be able to take this excitement and learning back to their own country," she says.

Meagan Gillmore is a freelance writer in Toronto, ON.

Coding

Telling a device, such as a computer or phone, what to do, can be an empowering experience for students. Coding, or programming, is a skill that encourages kids to think creatively and innovatively. Learning coding connects to other subjects like math, reading, and science as students develop computational and problem-solving skills. Attend a field trip to get students practicing their coding skills!

Apple Field Trip

On field trips to Apple stores across Canada, K-12 students can exercise their imaginations using Apple products. The hands-on sessions include activities that allow students to explore creative storytelling through video and music, elevate ideas to action through posters or podcasts, develop multisensory learning, and learn the beginner fundamentals of coding and robots. The work they create may also complement existing classroom projects. To learn more, use the search term 'fieldtrip' at ***www.apple.ca***.

Canada Learning Code

Currently at 18,000, Canada Learning Code's kids program has a growing number of participants. The program offers youth ages 3-12 hands-on experiences that are designed to inspire them to learn about technology in a new way. Canada Learning Code sees technology as a medium for self-expression, and as a means for changing the world. Workshops cover interesting topics such as webmaking, gamemaking, and digital generative art making. Workshops are effective and engaging because of the 4:1 ratio of learners to mentors at every gathering. Programs are available in cities across Canada, including Toronto, Vancouver, and Halifax. Learn more at ***www.canadalearningcode.ca***.

Maker Kids

Maker Kids offers after-school programs, lunchtime programs, and workshops for schools in Toronto. All programs are customized according to the school's needs and the curriculum. They cover topics such as coding, robotics, and Minecraft. Students learn technical and soft skills, including design, engineering, coding, problem solving, and leadership. Projects include light shows, rovers, video games, apps, and night lights. Learn more at ***www.makerkids.com***.

YouthSpark Field Trips

YouthSpark field trips are free, two-hour events, for students aged 8 and older at Microsoft Stores across Canada. On the field trip, students learn to code, design games, and get creative with the latest apps and technologies. Students are introduced to programs such as Touch Develop, PicsArt, and Surface Pro 4 to help them explore the coding environment. Contact your local Microsoft Store, and ask for the Community Development Specialist to book a field trip, or visit ***www.microsoft.com*** to learn more.

Kids Code Jeunesse

For an in-class experience, learn code with Kids Code Jeunesse. Kids Code Jeunesse introduces computational thinking and computer programming with the help of free tools, like Scratch and Trinket, to students and teachers in Canadian schools and community centers. Their educational materials are developed for children from 5-12 years old. Kids Code Jeunesse members volunteer in K-12 classrooms to help teachers who are interested in integrating code into the language, arts, math, and technology curriculum. Instructors spend eight weeks with the teacher in the classroom and complete a teacher training session to ensure sustainable, long-term impact. Learn more at ***www.kidscodejeunesse.org***.

CURRICULA

FOR GRADES
9 TO 12

The following is a lesson plan excerpt from *Suffrage: Canadian Women and the Vote*, an interactive graphic novel and resource. To see the full lesson plans or to learn more, please visit ***canadiansuffrage.com***.

LESSON 4:
Voting: Why Bother?

The struggle for women's suffrage in Canada began at the birth of the nation and continued for almost half a century before the federal government granted "universal" women's suffrage in 1920. It continued on for 40 more years until finally, all women, regardless of race, gained the right to vote in 1960.

But do all women show up to vote today? How many Canadians of any gender vote today? According to Statistics Canada, in the 2015 federal election, 32% of people who did not vote gave the reason as "not being interested in politics." This was true for people of all ages between 18 and 64, men and women. Twenty-three percent of non-voters said they were too busy to vote.[1]

According to Statistics Canada:
"Voting is one of the most fundamental aspects of civic engagement. Many political scientists link voting with the health of the democratic process and argue that declining voting rates may be symptomatic of a "democratic deficit" (Pammett and LeDuc 2003; Nakhaie 2006). Because political participation can also influence public policy, others are concerned that lower participation may result in policies that are not necessarily representative of key constituencies, like those who tend to vote less (Archer 2003). As a result, the voter turnout rate is used as one indicator of civic engagement."

SUBJECTS

Citizenship, Global Citizenship, Canadian History, Social Studies, Political Studies

DURATION

3 to 4 classes

KEY VOCABULARY

Franchise: the right to vote

Suffrage: the right to vote in political elections

Suffragist: a person who supports or recommends extending the right to vote, especially to women

KEY CONCEPTS AND ISSUES

In this lesson, students will reflect on what they have learned from their study of the Canadian suffrage movement. They will consider how the struggle for suffrage has informed contemporary attitudes towards voting in general and, in particular, women's voting. How many women vote in today's provincial and federal elections? Which women vote and which ones don't, and why? What is the role of diversity in Canada? Why is voter turn-out of all Canadian women important to Canadians? Students will consider whether voting still matters in Canada, and come to understand that it remains a critically important responsibility of Canadians.

Students will also gain an understanding of how women became "persons" and gained the legal right to sit in Canada's Senate. They will explore whether what Canada learned from the struggle for women's suffrage and other rights, may help guide our country toward embracing attitudes and putting into place laws that reflect reduced political inequality among Canadians of all genders, ethnicities, and religions and greater diversity in government.

Students will use cameras to document their family and friends' attitudes toward voting and will attempt to connect with, and share evidence from, women of various backgrounds and ages about their attitudes to voting. They will summarize the experience and reflect on how their participation in this project may have created change.

EXPECTATIONS/OUTCOMES

Students will:

- Increase their knowledge of the struggle for women's rights in Canada, specifically the Famous Five and the Persons case.
- Examine and compare contemporary voter turnout rates in Canada and consider the implications for political representation and democracy.
- Gain insight into pros and cons of Canadian electoral reform and consider and suggest various options for action.
- Describe inequities in Canada, including gender inequity, economic inequity, racial inequity, and health inequity, and why these gaps matter.
- Examine and engage in, participatory action research as a method of learning about and documenting the impact of women's suffrage on women's contemporary attitudes to voting.
- Communicate their ideas, arguments and conclusions using various formats and styles as appropriate.

MATERIALS REQUIRED

- *Suffrage: Canadian Women and the Vote* graphic novel
- Computers or devices with Internet access
- Smartphones and/or video cameras
- Factors associated with voting resource (*www.statcan.gc.ca/pub/75-001-x/2012001/article/11629-eng.htm*)
- Study on increase in voting rates (*www.statcan.gc.ca/pub/75-006-x/2016001/article/14669-eng.htm*)
- Statistics Canada (*www.statcan.gc.ca*)
- Short documentary on Agnes Macphail (*www.cpac.ca/en/programs/telling-times/episodes/21254203*)
- Infographic on gender wage gap (*www.canadianwomen.org/sites/canadianwomen.org/files//Mind%20The%20Gap_0.pdf*)
- The Facts About the Gender Wage Gap in Canada article (*www.canadianwomen.org/facts-about-the-gender-wage-gap-in-canada*)

BACKGROUND

Even after women in Canada got the federal vote and had the provincial vote in some provinces, and even after Agnes McPhail was elected to the House of Commons (in 1921), women could not be appointed to the Canadian Senate. Why? The law did not consider them "persons." Albertans Nellie McClung, Emily Murphy, Irene Palby, Louise McKinney, and Henrietta Muir Edwards, who became known as the "Famous Five," fought to change this. In 1929, their legal struggle, in what was known as the "Persons Case," was successful. Although this designation of "personhood" did not apply to all Canadian women at that time, it did confer greater political power on many women.

As well, it created a precedent of interpreting the Canadian Constitution as a "living tree," which should be interpreted in a "large and liberal" way, rather than in a "narrow and technical" way. This is of great importance as it continues to be the way in which the Supreme Court interprets the Canadian Constitution.[2]

Even now, long after all women received the vote in Canada, many people argue that Canada still does not

offer a level playing field to women. In her October 2016 Riley Lecture, Canadian historian Veronica Strong-Boag stated that:

> "A truly level playing field for women, much as for racialized and otherwise stigmatized groups, goes well beyond the franchise itself to depend ultimately on both cultural respect and economic justice (meaning redistribution of resources) so that no one gender, class or race is privileged in governance. Those two fundamental cultural and economic preconditions stand at the heart of everyone's capacity to participate as equals in government. Today, however, lack of respect and material inequality thrive, whether we consider the sexist trolling that stalks the Internet or the gender wage gap. Such failings do much to explain why the promise of democracy remains unfulfilled in Canada and elsewhere in the 21st century."

STEP ONE: TEACHER-LED DISCUSSION

Have students reread the introduction to the graphic novel *Suffrage: Canadian Women and the Vote* and discuss the two teen characters' attitudes about voting. Ask the students to share their opinions of whether or not voting is important and ask for reasons. Have them recall that the teens change their perspectives and by the end of the story have gained an appreciation for those who fought for women's suffrage.

Summarize for students the role of the Famous Five in changing the law to recognize women as "persons" in 1929. Have them review the changes in suffrage rights for women up until the present-day.

STEP TWO: VOTER TURNOUT

Tell students that the voting rate increased between the 2011 and the 2015 federal election. Ask them if this surprises them or not, and to explain their answers.
Have students research this change.[4] They may want to refer to this Statistics Canada study (*www.statcan.gc.ca/pub/75-006-x/2016001/article/14669-eng.htm*). They may also want to examine information about the 2011 voter turnout and the 2015 voter turnout, which are also available on the Statistics Canada website (*www.statcan.gc.ca*). Have students pose their own questions or suggest questions such as these:

How many people usually vote in federal elections? In the past, who would usually vote and who wouldn't, and why? What data can you find about the voter turnout in 2015? Who was responsible for the increase in votes? What conclusions can you reach about why this might have happened?

Gather as a class and prompt the students to share what they learned. Ask, *Why do you think the Canadian government tracks voter turn-out and data about who votes? What does this have to do with democracy?*

STEP THREE: FROM GETTING THE VOTE TO GETTING ELECTED

Have students watch this short video about Agnes McPhail who ran for parliament in 1921 and became Canada's first female member of Parliament: (*www.cpac.ca/en/programs/telling-times/episodes/21254203*).

Have them consider these questions: *Why did Agnes McPhail decide to run for a parliamentary seat? What was the response of the public during her campaign and during her term in office? Explain whether you think it is important for women to be included in the Canadian parliament, and why. What would you say is the public's attitude now toward women in government?*

Have students watch the following video, or a similar one, in which the Special Committee on Electoral Reform discusses whether electoral reform could increase the representation of women, minorities and indigenous peoples in the House of Commons (*www.cpac.ca/en/programs/voting-reform/episodes/49192692*).

After viewing, have students form small groups of three or four. (Arrange for there to be an even number of groups.) Tell the students they will research and then discuss these questions among themselves: Is it important to have diversity in the House of Commons? Why or why not? Might electoral reform change the attitudes of voters about their impact on the political system, and is this desirable? Why or why not? Time them as they do a 15-minute online research blast. Then give them time to meet in their groups, discuss their thoughts, and make notes to clarify their thinking on the issues.

Have each team meet up with another team. Tell students to imagine they are presenting their views about electoral reform and diversity to their local federal MP and must write a policy paper. Point out to students their teams won't necessarily agree on, or disagree on, all their viewpoints. Tell them the purpose of the meet-up is to further discuss their ideas, consolidate their thinking as a larger group, and write up a policy paper that lists five or six recommendations for action.

Post the papers throughout the room for students to read and discuss.

STEP FOUR: IS THERE EQUITY NOW?

Have students discuss whether they think there is gender equity in Canada, and what that might mean. Discuss the possibilities of an income gender gap, an economic gender gap, a health gender gap, an educational gender gap, and so on. Tell students that the Canadian Centre for Policy Alternatives (*www.policyalternatives.ca/newsroom/updates/without-change-public-policy-canadas-gender-gap-will-persist*) measured the gender gap between women and men in a variety of areas. Ask them to research the results, and discuss the findings.

Have them look at the following infographic and discuss it (*www.canadianwomen.org/sites/canadianwomen.org/files//Untitled-2.jpg*)

Tell students that some people don't believe there is a wage gap then show students this second infographic (*www.canadianwomen.org/sites/canadianwomen.org/files//Mind%20The%20Gap_0.pdf*) or this article written by the Canadian Women's Foundation (*www.canadianwomen.org/facts-about-the-gender-wage-gap-in-canada*). Ask, *do men and women earn the same amount of money for the same work? Why is there a difference in that area? Should this be changed, and if so, what can be done?*

As a class discuss the broader topic: *are there other examples of inequity in Canada beyond gender inequity (e.g., economic, racial, health)?* Divide the class into four groups and have each group research one of these themes: Canadian gender inequity, economic inequity, racial inequity and health inequity. (You could have them each look at the Key Issues page on the Centre for Social Justice and use the information they find there.) Have each group prepare an infographic similar to the ones above and answer the key question: *why do we need to know about this?* (Those who are preparing the infographic for gender inequity need to show data that is not shown on the one above.)

Post the completed infographics in the class.

STEP FIVE: TAKING ACTION

Suggest to students that they have a role in influencing Canadian democracy by encouraging people to participate in elections by turning out to vote. Tell them about an approach to research known as participatory action research or PAR.[5] It has three basic aspects: participation, action, and research. Explain that this method encourages researchers to care about and

influence the results. They will use this method to both understand their community and change it, using what they learn as they do their research. They will not just learn about the community's views on the importance of women's suffrage and voting but try to influence them.

Small groups of students will arrange to meet individually with three to four family members and/or friends and three to four other individuals within their larger community. They will choose a diverse group of people who represent different ages, genders, ethnicities, religions, and socio-economic status. Students will document their conversations with these individuals, recording images and sound as possible (and with the permission of the individuals).

Students will prompt the individuals to share their attitudes about the importance of voting and, if possible, their own voting habits. Students will then chat with the individuals about the women's struggle for suffrage in Canada, sharing what they know. They will also share what they have learned about the importance of voters showing up in order to better represent the opinions, beliefs, and political views of all Canadians, and to have an impact on shaping Canadian policy. Then students will ask the individuals if what they have discussed is likely to influence their future voting practices in any way, and, if so, how and why.

Students will make a presentation to the class, using some of the footage they gathered (edited). They will summarize the experience and reflect on what they learned and how their participation in this project may have created change. When the presentations are finished, allow students time to circulate and discuss their documentaries with one another.

Tech and Reading

by Martha Beach

Jasmine is in third grade. She loves camping, fishing, and hiking in the woods with her older sister. She is a confident, enthusiastic, supportive friend and team participant. Yet, when it comes to reading, her confidence slips away. She has trouble going from the end of one line down to the next, often skipping lines and losing her spot, and has trouble turning pages quickly and carefully. Jasmine's self-esteem plummets each time the teacher asks her to read aloud. She understands letters, phonics, and spelling, but she struggles with overall comprehension. Because she finds no enjoyment, she lacks motivation to continue reading, and her skills do not improve.

Students like Jasmine are likely digital natives: they've grown up with technology and they find enjoyment from tablets, phones, laptops, social media, games, and videos. These kids are familiar with how tech works and they know how to troubleshoot if it doesn't. And for those who struggle with reading, adding technology is hugely beneficial. From voice dictation programs to reading apps that help kids with dyslexia, there are many ways that technology can boost learning and enjoyment for students like Jasmine.

Jasmine is a pseudonym for one student that Leah Fox, an education and human development specialist, once taught. The corresponding 2014 report titled "Effects of Technology on Literacy Skills and Motivation to Read and Write" outlines how strategically using technology in tandem with traditional methods, helped Jasmine improve her visual fine motor skills and overall comprehension. Her enjoyment and motivation for reading grew. "For younger kids, there are so many programs that are great for phonics learning, for those with dyslexia there is Lexia," says Deborah Rooney, an education specialist based in the Boston area. "With some programs, teachers can even monitor virtually what they read and how long they spend on it. They can track it," adds Rooney, who has been working in schools and in her own private practice for 25 years.

> **Kids who are used to reading in such a fun and interactive way on a tablet don't have the patience to sit and read a print book for an hour.**

A 2007 study titled "Electronic books: Children's reading and comprehension" published in the *British Journal of Educational Technology* found that "features such as word pronunciation, narration, sound effects and animations, which support the text, all help to remove the effort from decoding individual words and allow the child to focus on

meaning," so overall comprehension and enjoyment of reading increases.

Andrea Zorzi, a librarian with the Toronto Public Library, agrees that the tools available to help struggling readers are great. "For reluctant readers or kids who are dyslexic or suffer from some other learning impairment, there are tons of great technological resources they can use to improve their print literacy, as well as their general print motivation and or willingness to learn to read," she says. "Plus, if kids are reading—whether it's text in a video game or subtitles in a Japanese anime—they're reading. Whatever gets them engaged with a narrative can't usually hurt!"

As much as reading apps and games can help teach kids, it can also hinder their enjoyment if they are introduced too soon. "What I used to see occurring in first grade was that everyone used to be at a different point in knowledge of phonics and letters," explains Rooney. Now, everything starts in preschool, which is great if the student is ready for it. But some children require additional support or simply need time to enjoy storytelling, not worry about spelling. "Most kids now entering kindergarten know what used to be taught in grade one," says Rooney.

Amanda Halfpenny, a librarian with Conseil scolaire Viamonde (a Francophone school board in Ontario), also notices some reluctance to read for fun: "They don't find pleasure in reading and storytelling because they're getting phonics shoved down their throats [at a very young age]," she says of students at her school.

Additionally, the prevalence of technology can change a student's expectation about reading. "Kids who are used to reading in such a fun and interactive way on a tablet don't have the patience to sit and read a print book for an hour." Part of that is due to shorter attention spans in general. "They are so distracted by all that other stuff going on that the apps don't leave any room for imagination," says Halfpenny. Reading apps and games have colours and graphics. "They don't learn that reading is fun or has imagination," she says. Also, authors today are even writing shorter books to appeal to fast-moving youths.

EQUAL ACCESS TO TECHNOLOGY

Whether students love reading or not, equal access to technology is a real issue. Not all families can afford tablets, laptops, or even Internet access at home. Some public library systems are trying to bridge the technology gap outside of school. Andrea Zorzi highlights a great pilot program taking place now in the Toronto Public Library system. Launched in 2016, the strategic plan allows users who don't have Internet access at home to borrow Wifi hotspots. Technology is also offered within the school system. Some school districts that Deborah Rooney works with provide a Chromebook or other tablet to every student in high school and some schools have shared laptops.

Shared tech doesn't necessarily create equality. One teacher at Amanda Halfpenny's school in north Etobicoke, ON sets aside time in class for research. Each student has the same amount of time. The school provides shared laptops and the teacher is trying to level the playing field. But even that can backfire. "What I've noticed is they feel rushed. The whole process of reading different sources, analyzing the information, and choosing what best supports their argument is rushed," Halfpenny explains. "They'll just find a site, copy and paste some stuff, and base their entire project on one source." Of course, she and other teachers encourage the kids to seek out lots of information and put their findings into their own words to show they understand. "But they aren't given enough time to practice the tools of research and to understand and put it into their own words," says Halfpenny. She notes that this has led to a lot more copy-and-pasting plagiarism as opposed to understanding and paraphrasing. "Plus if you don't even enjoy reading you're not going to read two to three sources and pick the best information that is most supportive."

> **Some kids have much slower output because of slower motor skills. The ideas and knowledge are there but they can't get it out there fast enough.**

All of the swiping and tapping on screens also means that kids are not practicing how to hold pens and pencils properly or turn pages with dexterity and ease. Halfpenny notices a decrease in fine motor skills and knowledge of how to handle books. "With younger kids, you can tell by how they interact with a book, how they hold the book and turn the pages—some kids even walk on the books!" Halfpenny says, noting lack of dexterity can be frustrating for the student themselves.

"Fine motor skills are a double-edged sword," says Rooney. "Some kids have much slower output because of slower motor skills. The ideas and knowledge are there but they can't get it out there fast enough," she says. They can get stuck in a loop of relying on the technology instead of practicing to increase fine motor skills.

Overall, technology is an added bonus to aid in reading development, especially for those who are struggling. "It's a great perk. It's wonderful. But there's still a lot to be said about old school methods, like practicing fine motor skills and memorizing spelling," says Rooney. She questions whether technology is helping these kids get to where they need to be as adults. So many digital tools exist now that students don't always need to learn the most basic skills. Programs such as Grammarly and Noodle Tool eliminate the need for extended grammar knowledge and ability to write proper citations. "They need to be able to write a note or a cheque and they need those fine motor skills," says Rooney. "They need to learn how to spell if they want to be the boss!" Hopefully, the right mix of technology and traditional learning skills will help get kids on a healthy, easeful and enjoyable path to lifelong love of literacy and reading.

Martha Beach is a graduate of Ryerson University's journalism program. Currently, she is a freelance writer and factchecker in Toronto.

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Music Apps

Music can spark many positive emotions and reactions in children. It can encourage them to dance, positively change their mood, tap into their creative side, and create an environment of relaxation. The benefits are countless. Music is a meaningful component of children's development. Studies have shown that music can develop fine motor skills, help with language skills, and improve one's overall IQ. Here are a few music-based apps that can help incorporate more music into children's day-to-day routine.

My First Classical Music App

(iOS – $5.49 CAD)

My First Classical Music App is a great interactive introduction to classical music for students aged 4 and above. The app is full of information on where music comes from, who writes it, and what different instruments sound like. Tap words and pictures to hear the narration, snippets of classical music, sound effects from colourful animal-themed animations, and fun facts about instruments and classical musicians. The variety of music includes Grieg's *Peer Gynt*, Mozart's *Magic Flute*, Williams' *Harry Potter and the Sorcerer's Stone*, among much more.

Rhythm Swing

(iOS – $5.49 CAD)

With engaging animation, the Rhythm Swing app helps elementary students develop their rhythm skills. The beginning levels teach students to keep a steady beat and the more advanced levels incorporate a variety of notes and rests within the rhythm patterns. Each level has a brief instructional video that explains the new rhythm. Students can view and listen to short musical phrases, and then practice their skills.

Easy Music

(iOS – $5.49 CAD)

Aimed at students ages 5 and up, Easy Music is an accessible introduction to music theory for children. Animated characters teach students to recognize notes, pitch, melody, and rhythm. After achieving an understanding of the basics, students can begin composing their own music, with a colourful rainbow piano.

Auxy Studio

(iOS – Free)

Making music is a fantastic, creative experience. This free app takes complex music tools and makes them accessible to everyone. The app comes loaded with more than 50 unique sounds and drum kits. Each sound has a set of carefully crafted effects and custom controls for tuning it just right. All the controls can be automated over time for perfect mix control. Beats and melodies can be created with the loop editor and exported by tapping and dragging on the screen.

Kapu Bloom Tunes

(iOS and Android – $2.79 CAD)

Kapu Bloom Tunes is a peaceful, creative app, as it blends music and finger-painting on the screen. Children trace their fingers on the garden scene to make melodies, while also sprouting a plant that will sing nursery rhymes.

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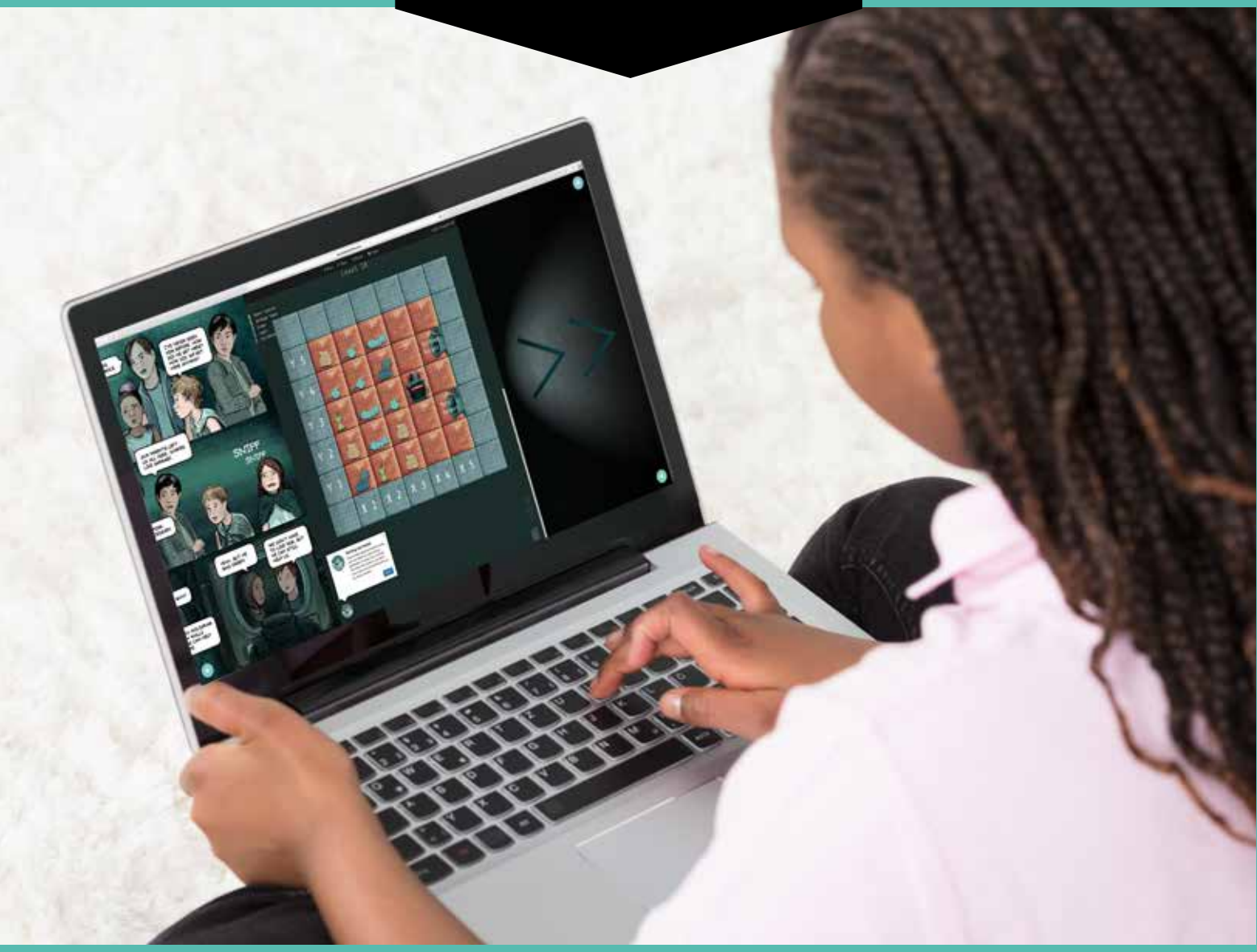

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