

# TEACH

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& Life Cycles



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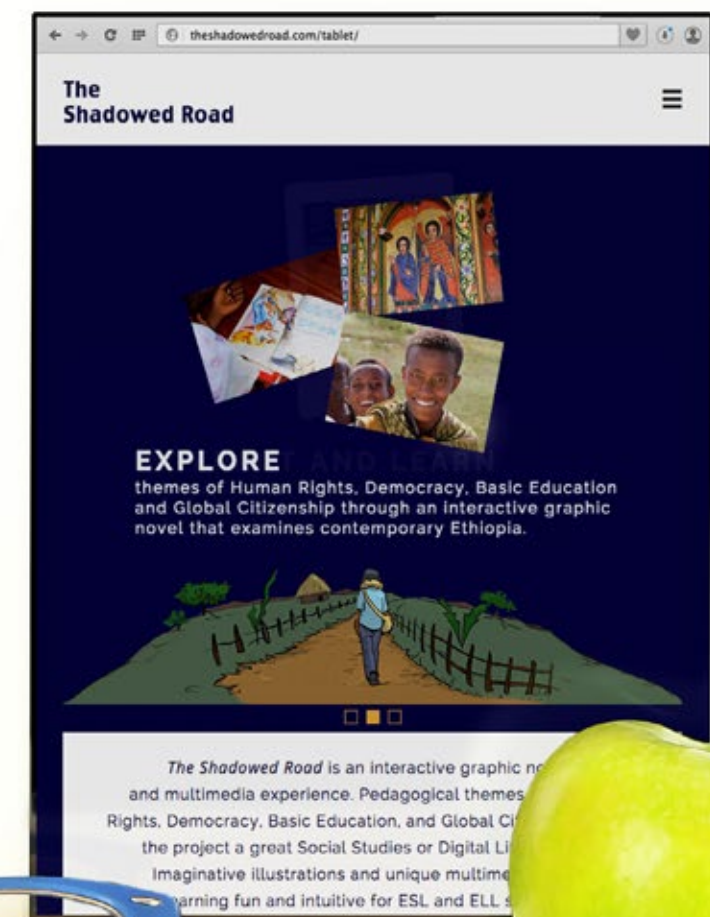
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The coronavirus pandemic threatens humanity within a specific timeframe. Either

the virus will become an ongoing presence in our lives like colds and the flu or it will be eradicated through the development of effective vaccines. In the throes of it, as we are at the time of this particular writing, it is terrifying, surreal and traumatizing all at once. We know that some aspects of how we live and work will likely change inexorably, hopefully for the better.

Although the pandemic currently monopolizes life as we know it, one day, it will fade into the background. Other issues are with us and have not receded while the world's efforts and resources fight this most recent threat. In a phrase, climate change, is still out there and threatening our way of life and existence. The time frame isn't as immediate but nonetheless, time for action is ticking away.

What efforts will be required to blunt the impact of climate change? Will we see comparable herculean acts comparable to what we've seen recently? What will it take to move societies and governments to action?

In recognition of the other pandemic we know as climate change, this issue of TEACH is dedicated to the topic. Our contributor, Adam Stone, writes about the

## NOTES

positive strategies teachers are implementing in classrooms with their students where 'practicality

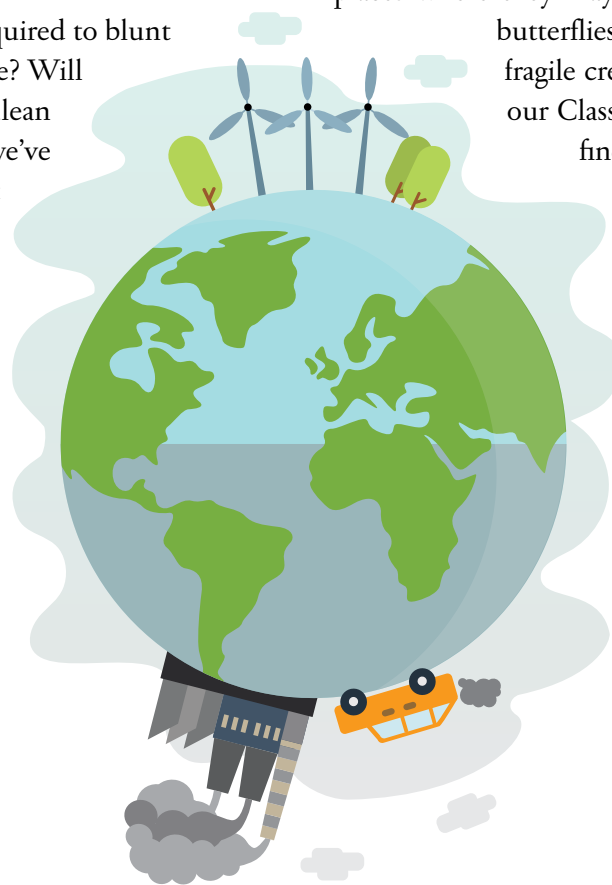
and hope based on facts and science' are promoted. Teachers focus on the positives and how students may better themselves in society by taking action and where doom and gloom is deemed antiquated thinking.

Similarly, another contributor, Meagan Gillmore, writes about student activists driving change, how it is kids who have taken the lead focusing attention on the needs of the planet and us. After so much doom and gloom recently, we accentuate the positive in dealing with the most important issue of our times.

Carrying on with the environmental themes, Webstuff is all about sites that promote sustainability. The Field Trips column delivers suggestions where you may take students, once back in school, to places where they may observe and interact with butterflies, some of the planet's most fragile creatures. And just for fun, in our Classroom Perspectives column, find out how you can set up a Rubik's Cube club in your school and how it can drive engagement in the classroom across grade levels and capabilities.

Until next time.

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# LEARNING ABOUT BUTTERFLIES

In light of schools being closed due to the pandemic as we go to press, the following field trips are listed for future consideration.

How does a caterpillar turn into a butterfly? Your students can find out with a field trip to a butterfly conservatory and witness this fascinating metamorphosis. Observing the beauty and grace of these colourful creatures up close will certainly capture students' interest, as you introduce them to the various stages of the butterfly life cycle. Here are some places to visit where kids can learn more about the lives of butterflies and how to keep them safe.

1

## VICTORIA BUTTERFLY GARDENS BRENTWOOD BAY, BC

Thousands of tropical butterflies, consisting of up to 70 species flutter around this enormous garden. Along with the array of butterflies, visitors can also see poison dart frogs, flamingos, tortoises, tropical flowers, fruits, and much more. The garden is the size of almost three basketball courts, providing vast learning opportunities as visitors explore something unique around every corner. This educational trip takes requests for groups of ten or more so make sure to plan ahead! For more information, visit: [www.butterflygardens.com](http://www.butterflygardens.com).

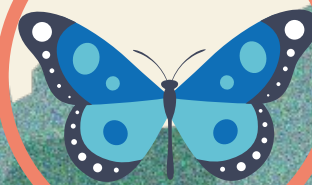


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## JOHN'S BUTTERFLY HOUSE MEDICINE HAT, AB

Located inside the Windmill Garden Centre, the John's Butterfly House is a 5000 square foot tropical paradise filled with exotic tropical plants and species of tropical butterflies such as the Blue Morpho, Atlas Moth, Paper Kite, Long Wing, and many more. The Butterfly House is open May to October and contains around 500 butterflies at any one time. School tours are an hour long and include a tour of the garden and an emerging house where students can view the different butterflies in their chrysalis form. Large groups are offered discounted rates. To learn more, visit: [www.windmill-gardencentre.com/butterfly.htm](http://www.windmill-gardencentre.com/butterfly.htm).

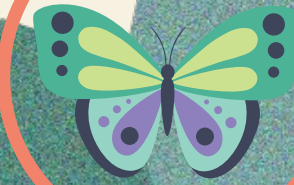


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## SHIRLEY RICHARDSON BUTTERFLY GARDEN WINNIPEG, MB

From late spring to early fall, this 2,000 square-foot exhibit is home to hundreds of butterfly varieties such as the Monarch, Painted lady, Black Swallow Tails, and Red Admirals. Outside, special plants attract local butterflies at all stages of their life cycle. Inside, the peaceful, pastoral garden features colourful perennial and annual flowers preferred by adult butterflies, a container garden section, as well as interpretive information. A central area houses a hatchery, displays, and demonstration space. For more information, visit: [www.assiniboinepark.ca/zoo/home/explore/exhibits/shirley-richardson-butterfly-garden](http://www.assiniboinepark.ca/zoo/home/explore/exhibits/shirley-richardson-butterfly-garden).



4

## CAMBRIDGE BUTTERFLY CONSERVATORY CAMBRIDGE, ON

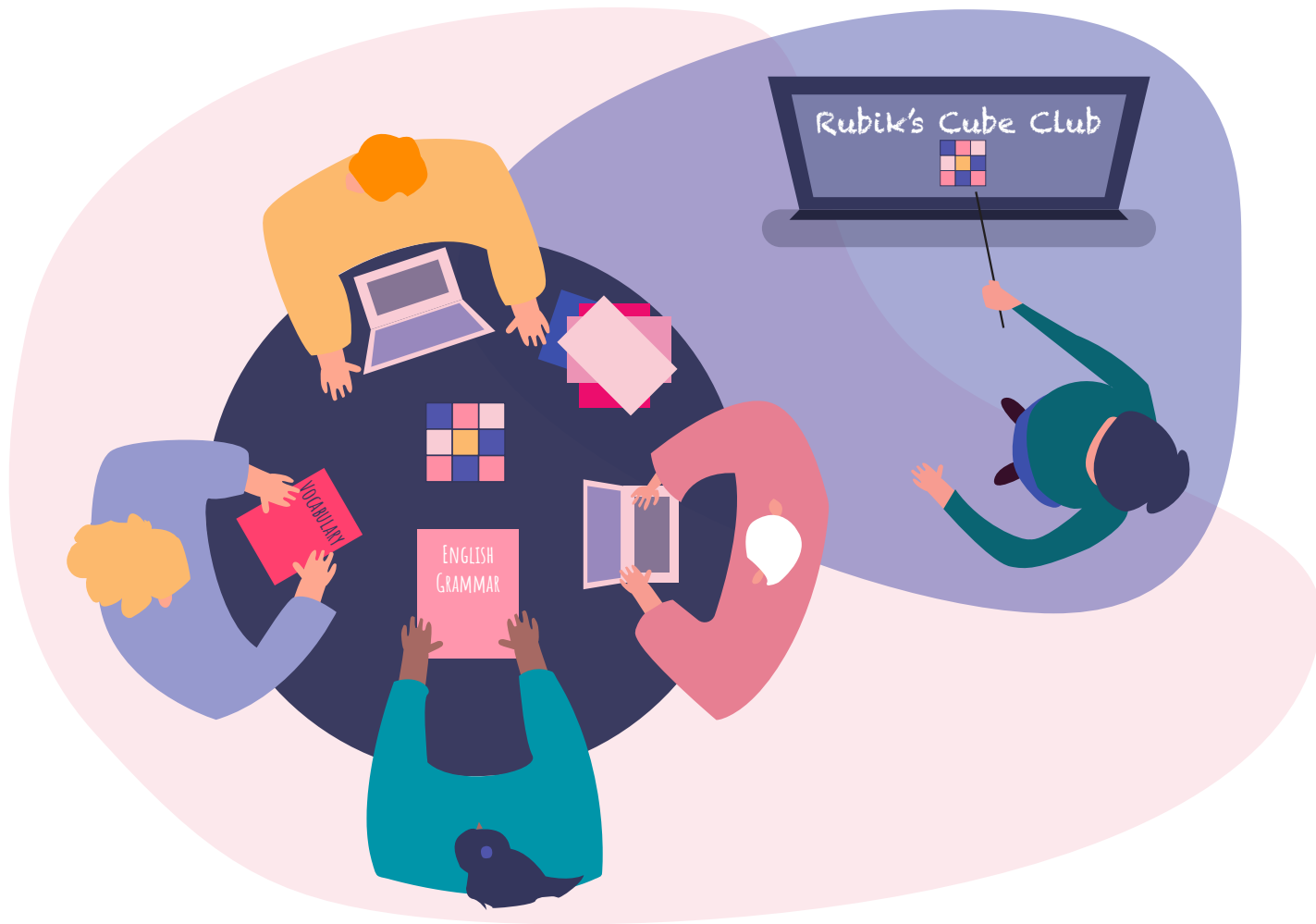
Learning takes flight at the Cambridge Butterfly Conservatory. The lush, tropical garden is home to thousands of free-flying butterflies. Students can marvel at these delicate creatures as they wander under the floral canopies or stop by the cascading waterfall. Field trips focus on inquiry and exploration, with a variety of curriculum-linked, hands-on activities. Each education program is 90 minutes in length and students will experience three different interactive components: the butterfly conservatory that is also home to birds, fish, and turtles; the learning discovery room, where they will participate in hands on activities; and the insect gallery, where brave enough students can meet some bugs up close and personal! A visit here will surely inspire curiosity and wonder about butterflies and other insects, and their importance in the natural world. To learn more, visit: [www.cambridgebutterfly.com](http://www.cambridgebutterfly.com).



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# Starting a Rubik's Cube Club

Author Sally Marin



Are you interested in improving student engagement with your English Language Learner (EL) students? Here's an idea that I tried at my elementary school that was both fun and successful—a Rubik's Cube club.

The idea came about during a home visit when I discovered that one of my EL student's older brother is a Rubik's Cube whiz. So I asked him if he'd like to help me organize a Rubik's Cube club at my school. Since he was a 10th grade student looking to complete community volunteer hours, this was a win-win situation.

First I met with his mother who was concerned about his ability to keep a 6-week commitment. Then I met with my potential "teacher." After a serious conversation, "Mr. Mike," our Rubik's Cube instructor was born. Upon getting my principal's support, we decided to go for it. I started researching. How would I get the cubes? Who should I invite? How do you solve the darn thing?

I settled on inviting the EL students from 3rd to 5th grades and wound up with a group of 15 students. We held hour-long classes once a week, for 6 weeks.

I also discovered the website [www.youcandothecube.com](http://www.youcandothecube.com) that has amazing resources, including a free loaner program! Now, I was armed with cubes, solution guides, videos, and lesson ideas.

I asked parents to donate snacks so that students could munch and crunch while we talked about perseverance during our warm up. "Never Give Up" became our club slogan and each week, I created a new inspirational poster with a quote for us to discuss. My personal favorite was by Thomas Edison who said, "I have not failed, I've just found 10,000 ways that won't work." It sums up my personal experience with the Rubik's Cube perfectly. Mr. Mike also shared his personal story, telling the kids that he was an EL student too. He had trouble focusing and learning to solve the challenging Rubik's Cube helped motivate him with his studies. Hearing Mr. Mike speak was so compelling for my students. All of these lessons also came in handy during EL testing.

Over the years I've noticed that most of my EL students have limited experience with playing games that involve solving puzzles, word games, or even simple board games. Developing critical thinking was one of my motivations for starting the club. So we began each session with a little friendly competition. First, I showed students the simple strategies of how to look for the edge pieces of the cube and to observe how they fit together. Next, we talked about teamwork and how to conquer the challenge together in small groups. Then, we divided up into three teams and competed to see who could solve their puzzle first. It was so fun and it really got those neurons firing.

Then it was club time. Mr. Mike sprung into action, first dazzling the students with his ability to solve the cube in minutes. Then, he showed them step-by-step how to attack the cube. I watched this young man grow into a committed leader of our club and the kids just loved him.

At times, it was a little chaotic. It took us three weeks to simply to get the Promethean board working, but we were modeling perseverance at the same time! I knew I was on to something when I realized that we had perfect attendance and kids were asking me how many more days until our next class.

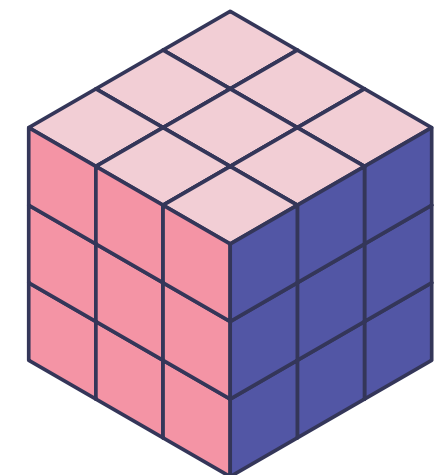
Other teachers started telling me that they were seeing kids bringing out their cubes before class and during recess. There was certainly a buzz around the

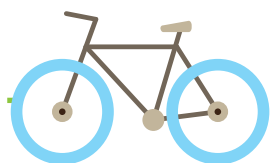
school about the cubes. Soon, other non-EL kids were asking me if they could join and I had to say, sorry but no. That was hard, but the EL kids were now in an elite club of their own. Language barriers melted and friendships were made across grade levels, as kids worked together to solve the cube.

Now, we have three students in the club who can quickly and systematically solve the cube. They want to be teacher's helpers next year, and one of my 5th graders is vowing to come back from his middle school next year to help. We are happily planning next year's club with the new set of 50 cubes that we won in a raffle from the folks at *You Can Do The Cube*. To qualify, all we had to do was return all the cubes in our loaner kit solved, which we had a lot of fun doing.

Sadly, Mr. Mike couldn't attend our last class due to an important event at his high school. I assured him that we would miss him, but that we would persevere. On that last day, however, and to my surprise, he skidded down the hall, dressed in his best clothes. As he burst into my classroom, he breathlessly exclaimed, "I couldn't miss the last class, Mrs. Marin! I got special permission to leave early." It was then that I realized the club helped more than just my elementary students. As for me, I'm still working on my own critical thinking and maybe someday I'll be able to solve it too.

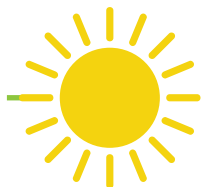
Sally Marin is an EL educator at Ballenger Creek Elementary School in Frederick, Maryland. She also serves as co-president of the Frederick County Literacy Chapter.



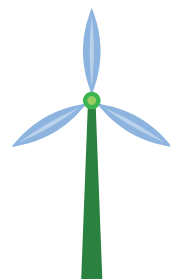
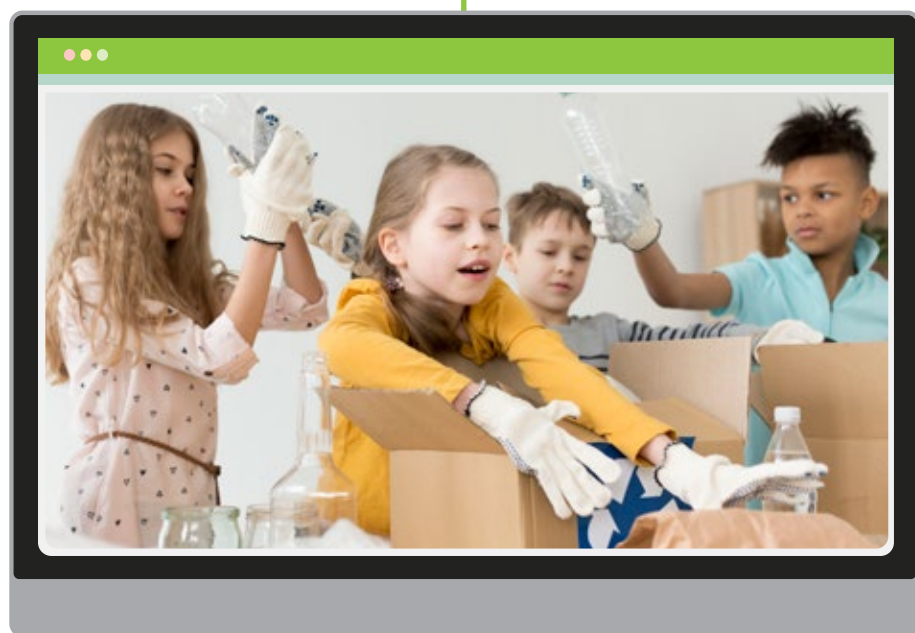


## Sustainability

With the warm weather fast approaching and summer right behind it, there are plenty of opportunities to discuss sustainability as students head outdoors to explore the world around them. Here are some resources to introduce concepts of sustainability in easy, digestible ways. These apps and websites are also designed to encourage students to start taking action towards a more sustainable future—both inside and outside of the classroom.



In light of schools being closed due to the pandemic as we go to press, the following suggestions are listed for future consideration.



**JOURNEY 2050**  
Free – Website

More than just a website, Journey 2050 is an educational experience. Created by teachers, agricultural experts, and professional game developers, it takes students on a journey through the world of agriculture and food production while challenging them to answer the question, “How will we sustainably feed a world population of 9 billion by the year 2050?” The program offers seven hours of free games, videos, and interactive activities that tie into grade 7-12 curriculums. Lesson plans are provided and guest speakers are available to deliver class presentations in some provinces/states. To learn more, visit: [www.journey2050.com](http://www.journey2050.com).



**EARTH RANGERS**  
Free – Website, iOS, Android

By signing up to become an Earth Ranger, students ages 8+ can take matters of sustainability into their own hands. Membership is free through the Earth Rangers app and gives students access to 20+ real conservation projects, educational videos, the Earth Rangers podcast, and much more. Upon registration, a personalized membership card and welcome package is mailed to each member. Visit [www.earthrangers.com](http://www.earthrangers.com) to find out more.



**KIDS VS. PLASTIC**  
Free – Website

An extension of National Geographic, this online resource is a useful way to start teaching children ages 8+ about the impacts of single-use plastics. From plastic reduction tips to crafts and DIY videos, there are plenty of hands-on activities to help kids take action against plastic pollution. They can even earn a Planet Protector certificate by taking the Kids vs. Plastic pledge. To learn more, visit: [www.kids.nationalgeographic.com/explore/nature/kids-vs-plastic](http://www.kids.nationalgeographic.com/explore/nature/kids-vs-plastic).



**JOULEBUG**  
Free – iOS & Android

Suitable for students in grades 6 and up, this app is designed to make sustainable living a fun and social experience. JouleBug promotes sustainable habits at home and during play by organizing sustainability tips into actions such as: ride a bike to school, bring lunch in a reusable container, plant a tree. Videos and links accompany each action to provide an additional learning experience. Each time an action is completed in real life, it can be logged on the app to earn points. Students can compete with their friends and in local challenges to earn badges and medals. For more information, visit: [www.joulebug.com](http://www.joulebug.com).







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**SHATTERED GROUND:  
SOLDIERS MARCHING  
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An educational, interactive project commemorating the First World War centenary. Shattered Ground is designed to engage students in an exploration of the main educational themes related to the First World War, the impact of War on a way of life, and the legacy of sacrifice that is part and parcel of engaging in conflict.

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## Lesson 2: Rebellion in the Land

Grades 9 to 12

### INTRODUCTION

Politics and the actions surrounding political events were fraught with emotion and frequently, extreme conflict. Mobs, unchecked by the British military presence, disrupted events such as elections and political rallies and attacked political figures and institutions. Upper and Lower Canada were subjected to British colonial rule and that meant the interests of Great Britain came first and foremost. In an interesting parallel to the present day, political elites were accustomed to having their way and their say excluding the grass roots citizens and voters. Discontent permeated societies in both provinces. In Lower Canada, minority rights were trampled upon and Francophones were treated as second class citizens. Working citizens in Upper Canada had their interests and needs ignored by a political infrastructure that catered to the privileged and those who benefitted from the patronage (or sometimes, bribery) as afforded by the British crown. The seeds of dissent had been sown. In October 1837, a rebellion led by Louis-H's mentor, Louis-Joseph Papineau, broke out. Later that year, in December, a rebellion led by Canada's first elected mayor, William Lyon Mackenzie, also broke out. Neither succeeded. Each rebellion was put down fairly quickly, although there were casualties and property damage.

### KEY CONCEPTS AND ISSUES

Students will learn about the early rebellions in Upper and Lower Canada as well as the counter-rebellions that occurred during the same period, why they took place, and what impact they had on the political scene at the time.

### DURATION:

3 to 4 classes

### MATERIALS REQUIRED:

- The Road to Confederation graphic novel
- Computers or devices with Internet access
- Materials needed for preparing presentations

### EXPECTATIONS/OUTCOMES

The overall expectations listed below serve as an entry point for teachers. Teachers are encouraged to make connections to specific expectations in their region and grade.

Students will:

- Increase their knowledge of Canadian history;
- Analyze the factors that led to political unrest and subsequently, armed rebellion;
- Examine the main players in the rebellions and the roles they played;
- Explain how certain key events and personalities affected the outcomes of the rebellions and other disruptive events;
- Demonstrate an understanding of the volatility in Canadian politics at the time;
- Describe the relationship between Canada and colonial Great Britain during the period 1800-1850 approximately and the latter's influence on these disruptive events;
- Communicate their ideas, arguments, and conclusions using various formats and styles, as appropriate for the audience and purpose.



### CURRICULUM LINKS

#### Alberta and Northwest Territories

Canadian History 20  
Local and Canadian Geography  
Perspectives on Nationalism  
Understanding Nationalism  
Nationalism in Canada and the World

#### British Columbia and Yukon Territories

Social Studies 10  
Social Studies 11  
Geography 12

#### Manitoba

History of Canada: A Foundation for Implementation  
Global Issues: Citizenship and Sustainability

## New Brunswick

Canadian Geography 120  
Social Studies 9, Canadian Identity 9

## Newfoundland/Labrador

Social Studies 9  
Canadian Geography 1202  
Canadian History 1201

## Nova Scotia

Canadian History 11  
Geography 10  
Global History 12

## Nunavut

History, Geography, Environmental Science

## Ontario

Canadian History since World War 1  
Canadian and World Issues: A Geographic Analysis  
Canada: History, Identity and Culture

## PEI

Social Studies 8  
Canadian History 12

## Saskatchewan

Social Studies 9  
Canadian Studies 10  
Social Studies 30  
History 10  
History 30

## Quebec

History and Citizenship Education

## BACKGROUND

We think of Canada as a peaceful and peace-loving nation. We learn in school that Confederation was a negotiated settlement, a bargain, in effect, struck among political leaders and prominent personalities (all white men with no female or indigenous representation) culminating in a month-long process in Great Britain. This process then saw the creation of the British North America Act that legitimized the creation of Canada, the country. As we know, much preceded this event, a lot of which, transpired during the lifetimes of Robert and Louis-H who, heavily influenced the direction of events through steadfast belief in the principles of Responsible Government, turning away from violence and violent confrontation and engaging in democratic nation building. That is, bringing to life political processes, establishing institutions and embodying values we take for granted today. Canadians compare themselves to Americans, whose democracy sprang to life out of bloody revolution. America is a violent society because it was birthed out of violence. Yet, Canadian hands are not so clean, stained by confrontation between social classes, discrimination against minorities, mob rule and of course, its deplorable treatment of indigenous communities. To understand who we are as a nation, we need to know from where and what we came.

## STEP ONE: TEACHER-LED DISCUSSION

Teachers will introduce this notion of violence and mayhem that often characterized politics during the period where Robert and Louis-H tried to break the shackles of colonialism and institute a system of responsible government. What do students know of this period? Make a list of their impressions on the board. Are there other examples of countries that became established because of either non-violent means or the opposite? For example, what about countries like France, Mexico, the United Kingdom, Switzerland, Italy, Greece, Israel, Iran, China, South Africa, Sudan, India or Pakistan to name some? What processes were at play to bring these countries into being? Look at maps prior to and after the two world wars. Are there differences in the boundaries and the configurations of the countries? Did the boundaries and even, the names

of the territories/countries change? For example, what became of the Austria-Hungary Empire after the First World War?

## STEP TWO: COUNTRY PROFILE

Have students select one of the countries mentioned above then research and write a paper exploring the following issues:

- Focus on the modern-day iteration of the country;
- Look at the country's history and events that led up to its modern-day iteration (for example, seceding from British rule created modern day India but led to a war with Pakistan; modern day Israel came into being through a vote in the United Nations but fought a war with surrounding Arab nations, etc.);
- Identify key events and individuals that influenced the outcome;
- Current state of affairs within the country;
- Position of the country within the global community (i.e., part of the EU, coalition, trade pacts/agreements, participates in NATO etc.); and
- Media coverage concerning the country selected (critical analysis of how the country is portrayed in the media).

The essays will be a minimum of two pages but not more than four pages. The papers will be handed in to the teacher for assessment.

## STEP THREE: PRESENTATION

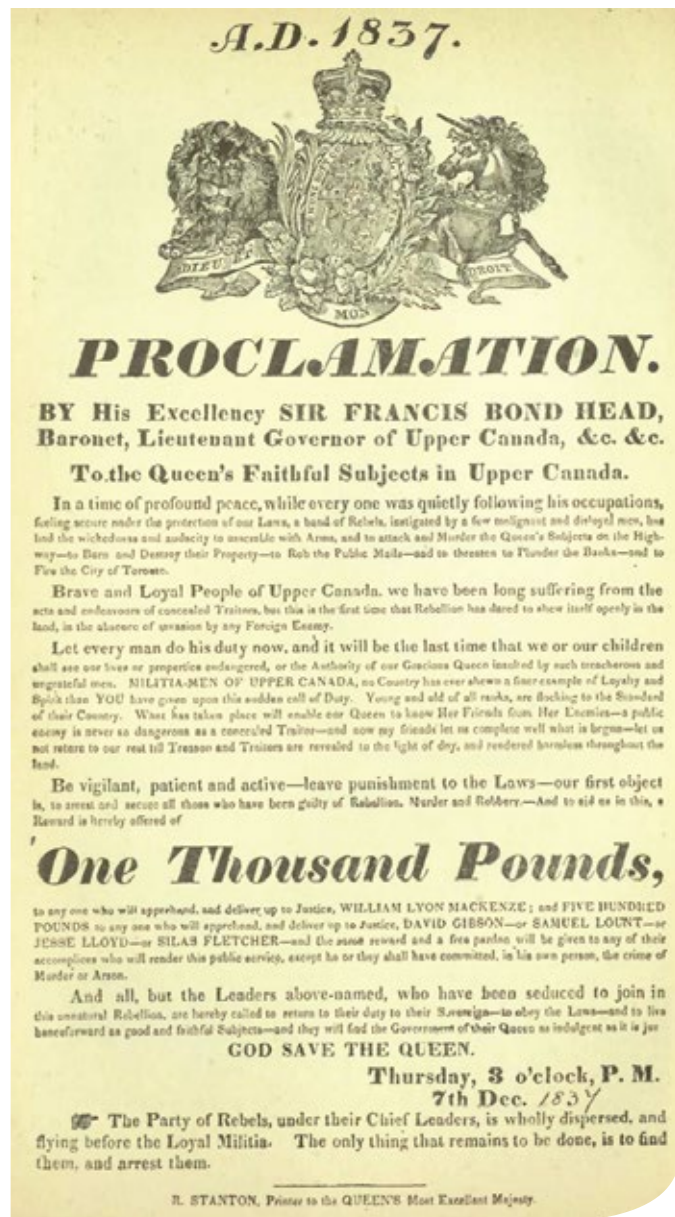
Taking the country selected for the essay written for Step Two, have students use the paper as a foundation for an oral presentation using visual elements that describe the evolution of the country selected leading to its current status. Students may use whatever tools are at hand, i.e., design/presentation software such as PowerPoint, Prezi etc., include video, images (archival), music, sound effects and so on. The presentations will be made to the rest of the class and assessed by the teacher.



## STEP FOUR: CULMINATING ACTIVITY

In the steps above, we have seen the potentially disruptive events that have taken place in other countries, events that, nonetheless, had an effect as to how those countries evolved and helped determine what kind of government came into being. In 1837, in both Lower and Upper Canada, armed rebellions broke out. Each was subsequently squashed by the British military and the rebellion leaders went into exile to the United States.

Teachers will divide the class into teams where each team will develop a scenario based on one of the rebellions. The scenario will take the form of a mock trial (See the Trial of Louis Riel as reference). This may take the form of a short one-act play possibly. The setting will be a courtroom and the characters will consist of the defendant, the judge, the crown attorney (prosecutor), the defense attorney and any witnesses



deemed applicable to prove or disprove the case. Student teams will work on developing this scenario, script it, rehearse it and then perform it for the rest of the class.

Each presentation will then be assessed by the teacher.

#### OPTIONAL EXTENSION ACTIVITIES:

- Mapping exercise. Based on the previous tasks, have students map countries around the world that have true, functioning democracies as opposed to countries that have some other system of government. How many countries fall into the democratic category?

- Courage of conviction. There are those throughout history who have stuck to their principles to effect change for the greater good. For example, individuals such as Dr. Martin Luther King Jr. and Nelson Mandela, in relatively recent times, found courage in their beliefs. In the case of Dr. King, he marched to end segregation in the face of violent threats and intimidation. Nelson Mandela fought against the South African racial policy of Apartheid and served 27 years in prison until his release, culminating in his election to the presidency of that country. Are there other examples of individuals who have maintained the courage of their convictions to effect positive change in society? Have students name two others and describe what each of them accomplished and how.
- We often hear of the idea of rebellion and those who are or have been rebels. What is the origin of rebellion? Where does it come from? Can students name some notable examples? (For example, the American and French Revolutions.) Have students document the origin of rebellion while describing one or two instances where rebellion was fomented.
- The 1837 Rebellions of Lower and Upper Canada, like all rebellions, constituted a revolt against authority. Have students assess the level of success of these rebellions. Did they have a long lasting impact? If so, how? If not, why not? Could the rebellions been organized differently for greater, long-lasting impact? What strategies might students suggest that may have helped those rebels of long ago. Have students imagine they are involved in planning their own rebellion. What would they rebel against and how might they organize it?

#### ASSESSMENT AND EVALUATION

##### Student Evaluation Questions Specific to the Lesson Plan

#### Before (Pre-Implementation)

- Do students have a general understanding of the principles of rebellion as it plays a role in the evolution toward democracy?
- Do students have a clear understanding of the significance of the early influences of the rebellions of Lower and Upper Canada on the development of Responsible Government?
- Do students have any prior understanding of the aforementioned rebellions and their importance to Canada's history?
- Are students familiar with the history of rebellion in other nations throughout history?

#### After (Post-Implementation)

- Students will describe the reasons for the 1837 Rebellions and list their significance.
- Students will reflect an understanding of the importance of rebellion in the Canadian political process.
- Students will reflect on, and explain their ideas about the legacy of 1837 rebellions.

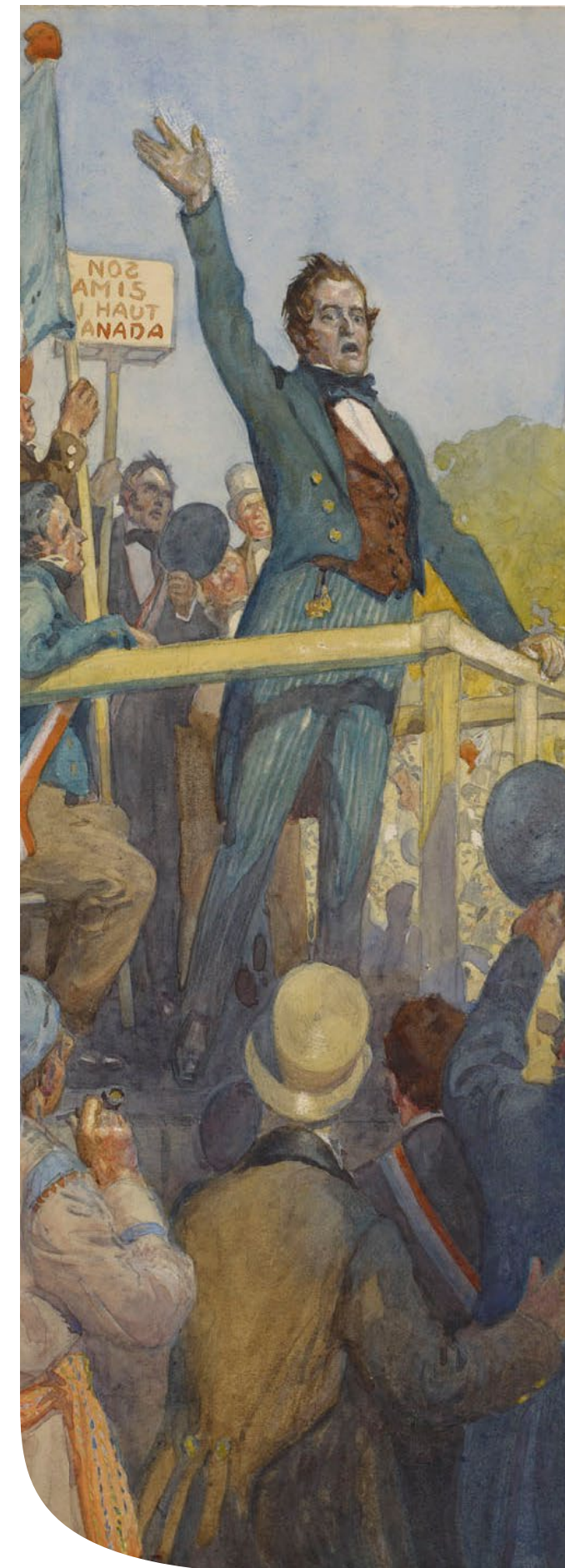
#### Teacher Evaluation Questions

#### Before (Pre-implementation)

- Do you have a general understanding of the importance of rebellion and its role in countries evolving toward democracy?
- Do you have a clear understanding of the significance of the 1837 rebellions?
- Do you have any prior understanding of the importance of rebellion in the development of other nations throughout history?

#### AFTER (Post-Implementation)

- Describe historical rebellions and their impact on countries where they took place.
- Have a clear understanding of the impact of the 1837 rebellions.
- Understand why the 1837 rebellions were important within a Canadian historical context.



GENERAL RUBRIC

	Level 1	Level 2	Level 3	Level 4
<b>Discussion</b>	Student participated poorly in the teacher-directed discussions	Student participated adequately in teacher-directed discussions	Student participated actively in the teacher-directed discussions	Student participated exemplarily in the teacher-directed discussions
<b>Content</b>	Student demonstrated limited understanding of concepts, facts, and terms	Student demonstrated some understanding of concepts, facts, and terms	Student demonstrated considerable understanding of concepts, facts, and terms	Student demonstrated thorough understanding of concepts, facts, and terms
<b>Written Work</b>	Student's written report was confusing, poorly structured, and had many grammatical errors	Student's written report was generally clear and had some structure, but numerous grammatical errors	Student's written report was clear and well-structured, but had a few errors	Student's written report was very clear, well-organized, and had virtually no errors
<b>Presentation</b>	Student's presentation was confusing, lacked emphasis and energy, and resulted in no discussion	Student's presentation was generally clear, but lacked energy and emphasis, and resulted in little discussion	Student's presentation was clear, vibrantly presented, and resulted in a good discussion	Student's presentation was very clear, enthusiastically presented, and resulted in an engaging discussion
<b>Group Work</b>	Students made a minimal contribution to the group; very little cooperation	Students made some contribution to the group, but cooperation was superficial	Students made a considerable contribution to the group, with a good level of cooperation	Students made a significant contribution to the group, with an excellent level of cooperation

SPECIFIC RUBRIC

	Level 1	Level 2	Level 3	Level 4
<b>Step One</b>	Student demonstrated a limited understanding of the concept of rebellion and its impact in other countries	Student demonstrated a basic understanding of the concept of rebellion and its impact in other countries	Student demonstrated a good understanding of the concept of rebellion and its impact in other countries	Student demonstrated a thorough understanding of the concept of rebellion and its impact in other countries
<b>Step Two</b>	Student demonstrated a limited understanding of the country selected and how it evolved	Student demonstrated a basic understanding of the country selected and how it evolved	Student demonstrated a good understanding of the country selected and how it evolved	Student demonstrated a thorough understanding of the country selected and how it evolved
<b>Step Three</b>	Student demonstrated limited understanding of the country selected and a limited effort in the presentation	Student demonstrated adequate understanding of the country selected and a satisfactory effort in the presentation	Student demonstrated significant understanding of the country selected and an active effort in the presentation	Student demonstrated thorough understanding of the country selected and a substantive effort in the presentation
<b>Step Four</b>	Student contributed minimally to the production of the mock trial and limitedly to the presentation	Student contributed adequately to the production of the mock trial and satisfactorily to the presentation	Student contributed significantly to the production of the mock trial and actively to the presentation	Student contributed thoroughly to the production of the mock trial and substantively to the presentation

# Carbon Neutral: Messages of Hope

Author Adam Stone



At Berkwood Hedge School in Berkeley, CA, first-grade teacher Natalie Crowley recently led her kids through a three-day “teach in” on the topic of climate change. There was an all-school assembly. Speakers talked about recycling. Then the kids did projects: Calculate your carbon footprint. Learn how to make a solar lantern.

“They learn best through activity and experience,” Crowley says. “There is so much fear and anxiety around climate change; [a] sense of disaster. It’s really important to empower kids with tools, to remind them that all is not lost and that they can do things that make a difference.”

That’s K-12 climate change in a nutshell. At a time when it would be easy to scare them silly, educators need to empower kids instead. They need to foster in young learners not just an understanding of the science behind climate change, but also a feeling that they themselves can make a difference. Kids need to know that change is possible.

## ‘PRACTICALITY AND HOPE’

For K-12 teachers looking to incorporate crucial information on climate change, a positive attitude is the first order of business.

“We’re trying to give them a message of practicality and hope, based on facts and science,” says Jenny Wiedower, Senior Manager, K12 Education at the U.S. Green Building Council. “We want to help them develop skills and ways of thinking that can contribute to combating climate change and to developing a more sustainable future.”

At the National Wildlife Federation, Director K-12 Education Elizabeth Soper talks about “climate resilience,” which is the notion that environmental changes have wide-ranging social and economic impacts. She too grounds her approach in the notion of kids’ agency, their ability to make meaningful changes in their own world.

“A climate resilient student is someone who knows about all the issues—both the environmental and the social-economic—so that they can make good decisions in their own individual lives and in their communities,” she says.

The song is much the same at the Green Schools Alliance, where Acting Executive Director Arlae Castellanos encourages K-12 teachers to look beyond the predictions of calamity that tend to dominate media discussions around climate change.

“Doom-and-gloom is a very antiquated way of thinking,” she says. “When you are talking to young

students, you need to be talking about the positives, the things they can do to be a better person in society. It’s bigger than just talking about climate. It’s about what you can do to be a responsible person overall. That’s the way to frame it.”

These experts, all of whom stand at the intersection of education and climate change, agree on the basic messaging. They want kids to live their best lives, to feel empowered to act, and to view climate change not as an existential threat but rather as an opportunity to change their world.

How does that look in practice? Educators say the key lies in keeping things practical. By getting kids engaged and involved, even on a small scale, teachers can reinforce the notion that young people are not powerless.

## IN THE CLASSROOM

Marissa Syracuse teaches third grade at Seminole Science Charter School in Lake Mary, FL, where teachers and students together have implemented the beginnings of a waste-reduction solution. “We created this program after noticing the huge amount of potentially recyclable items being thrown in the trash,” she says.

From this simple observation came a comprehensive recycling program. “Each classroom has their own

recycling receptacle—a used cardboard box they decorated as a group, which is emptied every Monday,” she says. “Every classroom also does its best to repurpose paper. If there’s writing on one side of it, we save it for scrap paper instead of throwing it away. This is perfect for things like brainstorming, art projects, and note taking.”

She has also developed a “recycling relay race” where students learn through conversation and interaction about the various recyclable materials. “After discussing what should be recycled and the different types of materials, students had to race to put the items in the correct bin,” she says. “These students were energetic and excited racing to recycle, but they were also learning a valuable lesson about how to effectively clean, sort, and dispose of their recyclables.”



At Escanaba Junior/Senior High School in Michigan, Assistant Principal Jessica Garber recently introduced a program that helps to engage kids with climate change over a topic they can readily relate to—candy.

Experts say Americans purchase nearly 600 million pounds of candy for Halloween each year. Last fall the Escanaba schools signed onto the “Trick or Trash” project offered by recycling company Rubicon, gathering many hundreds of discarded candy wrappers as an object lesson in the possibility of change.

“We had just started an environmental club and this was our project. I liked it because it was easy. We signed up and they sent us a box and then we promoted it throughout the school,” Garber says.

Following the school’s involvement in a regional youth symposium that focused on climate change, the candy-based effort seemed like a good way to put the students’ emerging awareness into action. “They hear so many negative things about the way our world is treated, things they don’t have any control over,” Garber says. “We want to show them how small things they can do can make a difference.”

In the same way that candy offers a familiar and friendly way to talk about climate change, other experts say that when talking to K-12 students, it makes sense to start close to home and what could be closer than their own schoolhouse?

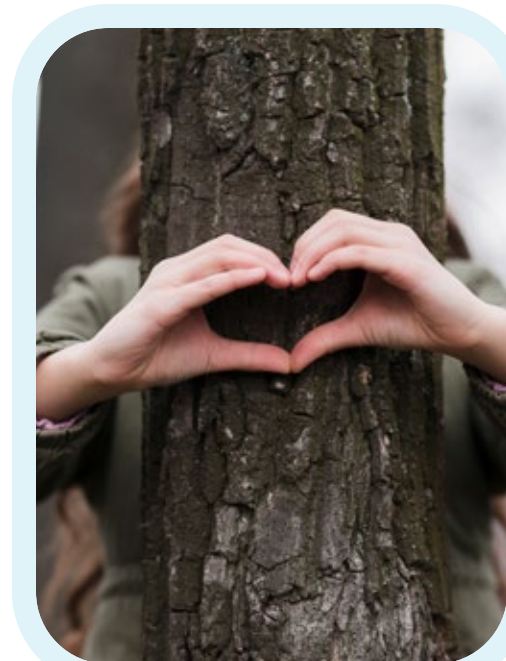
“Students are already learning in buildings, and so the building itself becomes an incredible opportunity to pair learning with action,” Wiedower says. “We see classes conducting energy audits to understand how the building uses energy and working with building staff to identify areas where they can implement change—even if it’s just turning out the lights or unplugging unnecessary appliances.”

The school building offers a range of ways in which students can discover and measure for themselves the realities behind what they have learned in the abstract:

How many kilowatt hours of power? How many bins of trash? “You can use your own school as a teaching tool,” Wiedower says. “That’s pretty incredible, for students to have that kind of role in the place where they are actually doing the learning.”

Crowley went a step further, literally sending the lesson home. She followed up on her school’s climate change teach-in with a challenge for students and parents to document their environmental efforts around the house. “The expectation is that every family will do at least one thing on the list, and they will submit a photograph to document that, to go in a shared Google album,” she says.

She doesn’t want to confine the lessons of climate change to the classroom, but rather to make them an integrated part of students’ lives. “The reality of this situation is that this is something that is ongoing, something that is only going to become more important,” she says.



## TEACHING THE SCIENCE

Of course, K-12 also needs to teach the science around climate change. The key here, experts say, is to keep those lessons age-appropriate.

An instructional specialist at Washington University’s Institute for School Partnership, Lauren Ashman develops science programming for St. Louis area schools. Middle schools may chart the blooming times of plants to measure the effects of a warming climate, while high schools delve deeply into data from the Intergovernmental Panel on Climate Change.

“At the elementary level they focus more on human impacts in general, how human activities impact the environment in different ways,” she says.

This in turn led kids from one local elementary school to successfully petition their school board to ban plastic straws in the cafeteria—leading us back to that

notion of positive empowerment. “We focus the fact that even as young people, they still have the ability to become involved in developing solutions,” Ashman says.

## TOOLS & RESOURCES

There is a range of resources available for teachers looking to incorporate climate change into their K-12 lesson plans.

The Rainforest Alliance offers [15 ways](#) to teach green. (“Keep a few plants on your classroom windowsills to improve air quality.”) The Environmental Education Alliance has a [similar list](#), as does the nonprofit group [Population Education](#).

The U.S. Green Building Council’s [Learning Lab](#) offers a K-12 curriculum that encourages student leadership, sustainability literacy and real-world action. Climate Change Live offers detailed [lesson plans](#) by grade, while the National Education Association has an extensive [list of resources](#) available. To make the commitment to climate change practical and tangible, Hampton Roads area teachers can [pledge online](#) to take specific steps toward having a greener classroom.

With all these various tools in play, a simple rule of thumb applies: The more hands-on, the better.

“Kids can take on authentic issues in their school or their community,” Soper says. “When they collect data and take action, they learn a heck of a lot more than when they are just reading it in a textbook or watching a video.”

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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# Planet School: Building a Greener World

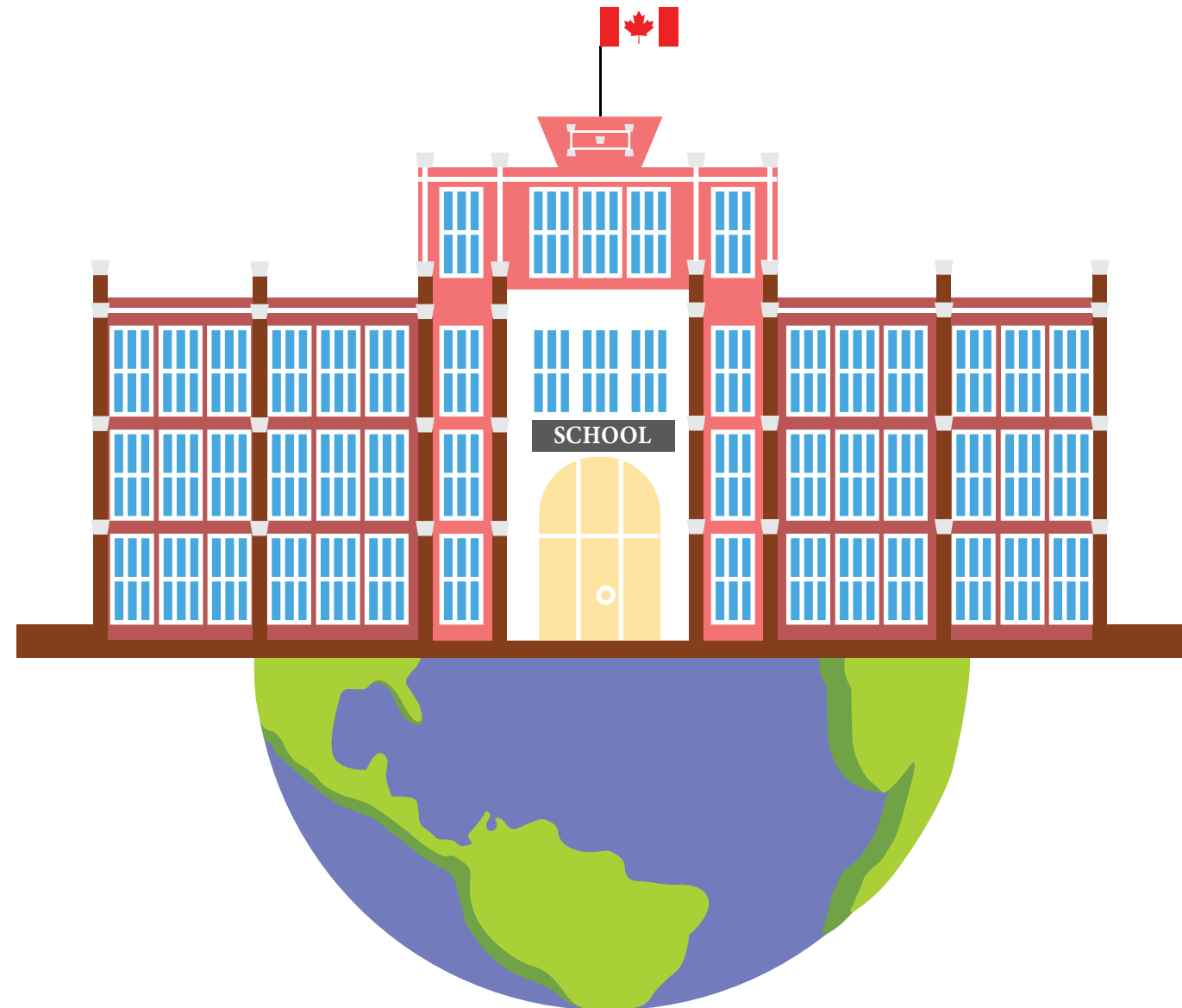
Author Meagan Gillmore

It's not easy for teachers when students strike and urge governments to act on climate change. Depending on school policy, it can be hard for educators to know how to respond. Encouraging students to be civically informed is a good thing, but is it right to advocate they skip class? Some teachers' unions have publicly supported the strikes; some school boards have formally declared climate emergencies. Others may seem slow to join the discussion.

The movement may have shocked some observers, but many who have spent their careers in environmental education say the seeds were planted decades ago—and it's about time.

"Many of us feel that we're at a tipping point," says Hilary Inwood, environmental and sustainability education lead at the Ontario Institute for Studies in Education (OISE) at the University of Toronto. "Many of us have been working in the field for a long time and felt it was hard to get attention brought to the whole importance of environmental education. The climate strikes are fantastic because it's youth standing up and saying, 'This is what we need. We need to be doing this at all levels of education. We need to be doing this across all levels of society.' And I feel we seem to be listening to them."

Inwood helps run a program where pre-service teachers and teachers at the Toronto District School Board (TDSB) come together and have professional development together about environmental education. OISE and the TDSB have been partners for more than a decade.



Inwood sees many aspiring teachers eager to use environmental education as a way to teach their future students about skills like communication, collaboration, and critical thinking. These discussions, however, aren't new to them; many participated in environmental education programs when they were in elementary and secondary school.

"We've had a couple of generations to plant the seeds for this work, and I feel like those seeds are starting to fully grow and take root," says Inwood.

What's happening on the streets reflects youth's growing awareness of environmental problems ailing the planet, the atmosphere, the oceans, and all living species—including them. Administrative policy may dictate how teachers respond to strikes. Preparing

teachers for responding to the needs of increasingly ecologically aware students is more complicated.

"Most students are very aware of those issues," says Marie Tremblay, senior education advisor for the Alberta Council on Environmental Education and a former classroom teacher. "Because we live in a digital age, students typically spend more time on digital screens than they do outside. So, there's a bit of a disconnect: not a lot of students have a lot of first-hand experience with the environment and with nature."

Students do have lots of exposure to quick, extreme temperature changes, and highly charged political discussions. If teachers are going to help them navigate through discourse concerning climate change, they'll need to dig deep.

## UNDERSTANDING INTERNAL THREATS

High school social studies teachers know they have to discuss controversial and difficult subjects with their students. Cathryn van Kessel, however, who has spent much of her nearly decade-long high school teaching career, has been unable to help her students fully articulate why certain subjects made them defensive or angry—and she was also a debate coach. The ability to respectfully discuss challenging topics is crucial when helping students respond to climate change.

"I feel with climate change, it's become as contentious as issues that are long known to be super-controversial: abortion, capital punishment, euthanasia," says van Kessel who now is a teacher in the faculty of education at the University of Alberta in Edmonton. "I feel recently, climate change is on par (with other controversial subjects)."

A few years before van Kessel left classroom teaching in 2015, she discovered trauma management theory (TMT). The theory focuses on humans' anxiety about death, and their beliefs about what happens to them after they die. These beliefs are informed by worldviews. When people's worldviews are threatened, they become defensive.

Climate catastrophes remind people of their own mortality and death, and that makes them feel threatened, says van Kessel. Those feelings get intensified when they encounter people who have strong values that differ from their own.



“Climate crisis is a double-whammy: it’s a direct reminder of death, and it also puts us at worldview threat, which is also a direct reminder of death. What this means is talking about the climate crisis is potentially more contentious than other topics,” says van Kessel.

Students need to learn how to respond to differing opinions if they’re going to thrive. Van Kessel suggests that teachers model this explicitly for their students. If a teacher feels threatened by a student’s comment, they should tell students why they’re feeling uncomfortable. Then, they should show the student how they’re going to respond to the discomfort—by taking a deep breath, for example—and that they’re going to continue to have a respectful conversation. Using humour appropriately to lighten the mood can help, as well as discussing good mental health and self-care strategies.

### MAKING CLIMATE CHANGE FUN

For students at Earncliffe Senior Public School in Brampton, ON, learning about climate change means learning programming. Students program their Micro:bits to water a vertical garden made from recycled pop cans. “It’s been amazing,” says Lisa Kao, the teacher-librarian.

Libraries are a perfect place to teach students about climate change. “A library touches all classes and all students. I can impact every single student,” she says. “I have a lot of time to experiment with my teaching than other teachers do because I don’t have the confines on my time.”

That’s important because using technology to teach about climate change often includes making mistakes. The Micro:bits started working on the third try, she explains.

Kao used materials developed by InkSmith, a company that produces innovative education technology. The company’s teamed up with Kids Code Jeunesse, a Canadian non-profit that teaches students about coding and Artificial Intelligence, to produce kits with activities designed to teach students about how to respond to the United Nations’ Global Goals for Sustainable Development.

The kits help students learn about climate change, while also teaching them about how to design solutions to problems.

“A lot of the students have an understanding of the problems and what is going on, but there is a lack of knowledge about how they can solve it,” says Michael Leonard, experimental learning and innovation lead at the Waterloo Catholic District School Board in Ontario.

These lessons also help focus students’ attention on solutions to problems, which helps keep some of the anxiety at bay.

“Students are tremendously engaged in an activity when we’re leveraging technology. And they see that technology can be used as a positive thing that solves problems, and we’re showing them that these things are going,” he says.

### CONNECTING IT TO PEOPLE

Educators who want to address climate change “need to be willing to go to places that maybe (they) haven’t explored,” says Jonathan Dyck, president of the Environmental Educators’ Provincial Specialist Association in British Columbia. This may include listening to people’s voices who aren’t always heard in climate change discussions.

Michael Ross, a teacher at Okanagan Mission Secondary School in Kelowna, BC, views climate change as a social justice concern. It demonstrates—and exacerbates—existing inequalities in society. “A lot of people that didn’t really cause the problem—geographically and generationally—they are the ones who are feeling the consequences,” he says. Indigenous communities may be disproportionately influenced by resource extraction; youth live with the consequences of older generations’ actions that have hurt the environment. If teachers want to speak effectively, they need to listen to these communities.

Dyck says Indigenous principles in curriculum have helped him incorporate discussions about climate change into his lessons. He learns from Indigenous elders, and also uses Indigenous practices in his classroom. Talking circles give all students an opportunity to speak and learn from each other. “(The circle) makes it democratic and prevents just one or two people monopolizing the conversation,” he says. It teaches students to decipher between facts and opinions, and ensures they’re exposed to views different from their own. “You might still stick with your previous opinion,” he says, “but it will be better informed.”

Ross says his goal as a teacher is to “create a community around a campfire.” This happens literally on outdoor education trips. In his classroom, he has students participate in a talking circle everyday where they learn about each other’s successes and problems. “When you feel like you belong, you feel stronger,” he says. “When you feel stronger, you build trust. When you have trust, you can go further and go faster.”

That’s particularly true for students who are often excluded from communities. When Lillie Craw’s class at Fir Ridge, an alternative public high school in the David Douglas School District in Portland, OR, tuned in to watch local climate strikes, they quickly discovered they couldn’t see any students like them: there were no students with visible disabilities involved. This really “shocked” her students, she says.

Students in special education classes often don’t learn as much about climate change, says Craw. In a city where vegan lifestyles are prevalent, her students often associated climate change with throwing away garbage, and not as quickly with greenhouse gas or carbon emissions. They were also learning how people

with disabilities are particularly vulnerable during natural disasters.

Craw has used comics in her teaching for years. She and her class made a comic book to explain climate change to younger students who also have disabilities. The books introduce students to how rising sea levels endanger different species. Craw’s class met with younger students and read them the comic books.

“They saw themselves not just as self-advocates, but as advocates for other students with disabilities,” she says.

Climate change education is rife with topics and discussions that can provoke anxiety. But it also creates opportunities for students to take action and develop empathy and leadership.

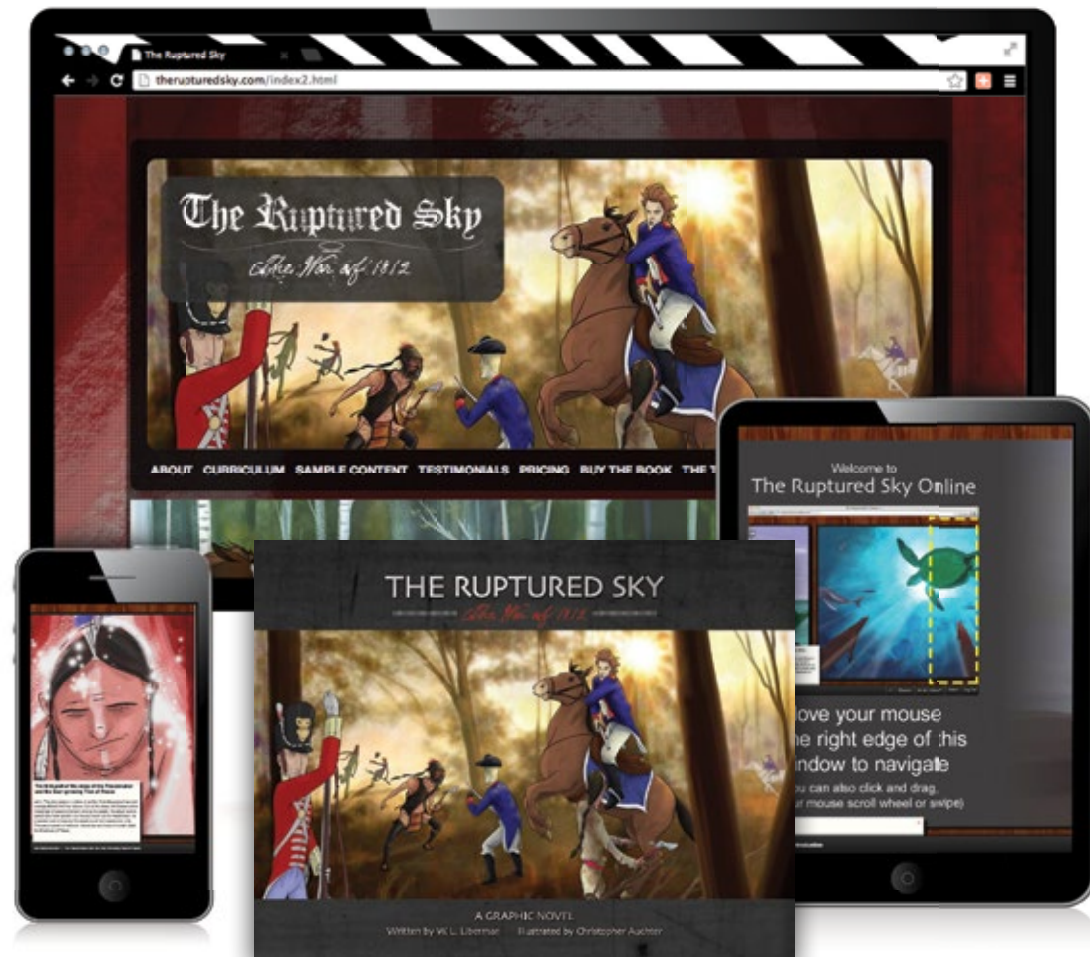
“It’s almost as if we’re there to help them and be resources,” says Dyck. “One of our jobs is to get out of the way and push them to advocate for the changes they need.”

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Meagan Gillmore is a freelance writer in Toronto, ON.



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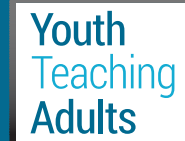


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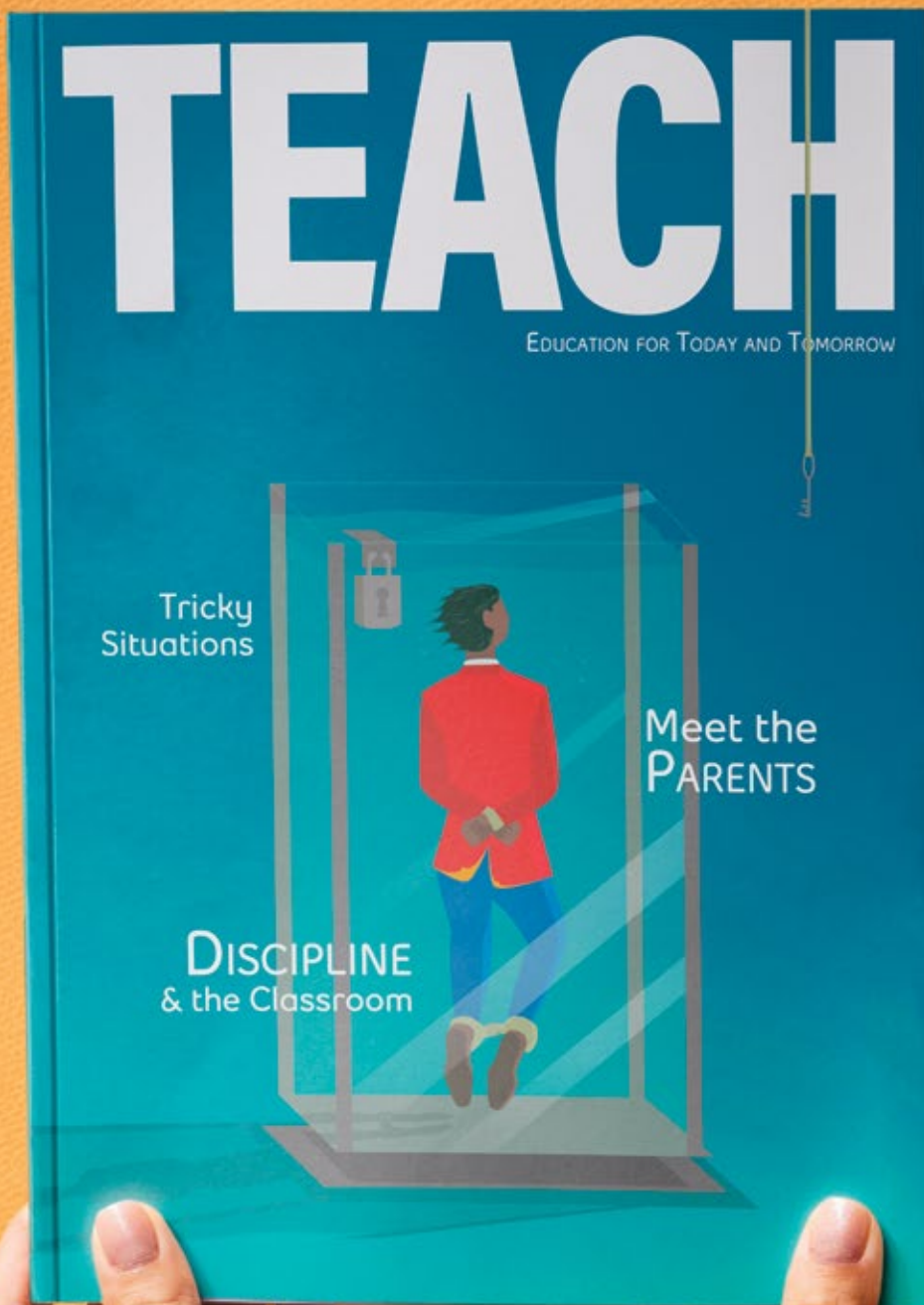
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