

# Teaching Climate Change Across the Disciplines



The **FPSE Climate Action Standing Committee** seeks to assist locals in pursuing initiatives to address the climate emergency. Climate impacts are inevitable and necessarily linked with issues of concern to unions and union members such as collective agreement language, education curriculum, health and safety of workers, and work to achieve environmental, racial, social, and economic justice for all. As such, the committee will coordinate and collaborate with other FPSE committees as needed early in policy development processes through a climate action lens. This committee will work together to advance the broader understanding of the inevitable impacts of climate change to increase perspectives and communication on interconnected issues.

**Our goals are to:**

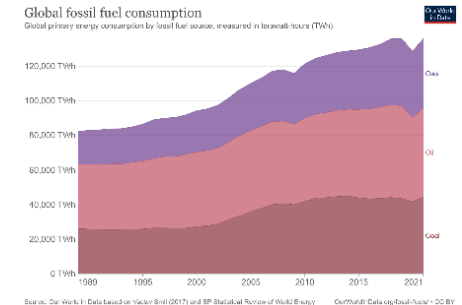
1. Assist Locals in advocating for climate justice, pursuing initiatives for climate justice, and climate action to address the climate emergency, which is interrelated with occupational health and safety, with international solidarity and human rights, and with decolonization, reconciliation, and Indigenization practices, and of course with protection of ecosystems.
2. Share resources on best practices related to the development and implementation of climate-change pedagogy in institutional and union education.
3. Network with appropriate organizations (including other FPSE committees, non-profits, activists, municipal and provincial representatives, etc.) to exert pressure on our institutions to act on the climate emergency.
4. Partner with appropriate organizations, with the approval of FPSE PC, to act on the climate emergency.
5. Create and pursue strategic initiatives focussed on the climate crisis, including through the collective bargaining process.
6. Liaise with specific local, provincial, national and international organizations which advocate for climate justice and recommend Presidents' Council formalize those relationships.
7. Assess climate action policies and processes at institutional governance structures, including Education Council and Senate.

# why climate change across the curriculum?

The first UN Intergovernmental Panel on Climate Change met in 1988. Since then, there have been a total of 27 meetings to confront the danger of climate change.

In 1989 the global consumption of fossil fuels was 82, 240 TWh (Terra Watt hours, a unit of energy). After 27 meetings where governments around the world agreed on the dangers of climate change and the need to take action, in 2021 the global use of fossil fuels had increased by 65%. In addition, even though everyone agrees that coal is the most damaging fossil fuel, its use has increased along with the rest.

The amount of greenhouse gases in our atmosphere has increased along with fuel consumption. In 1989 the concentration of CO2 in the atmosphere was 353 PPM. Last year it was 418 PPM. 350 PPM is the safe level where we might avoid catastrophic climate change.



We live in a world where the 2021 heat dome killed 600 people in BC, and the 2022 flooding killed 1700 people in Pakistan and displaced 30 million more. Atmospheric carbon dioxide levels are still rising; devastating events like these will be more common and more severe in the future.

Governments from every party and at every level have failed to take meaningful action to end our reliance on fossil fuels and put forward a path to a just transition. We need to take on the task of building movements in our unions and in our classrooms that treat the climate emergency with the seriousness it deserves. One part of that work is including curriculum on the climate emergency in our classes. We hope this pamphlet will help you partake in, or continue with, that journey.

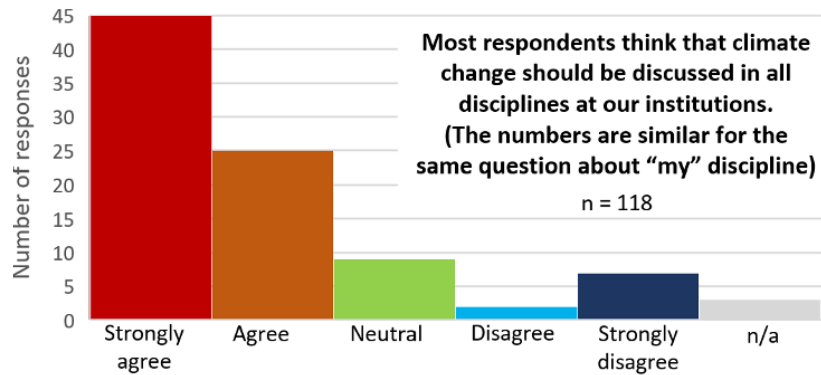
***"Education is our passport to the future, for tomorrow belongs to the people who prepare for it today" – Malcolm X***

As educators we have a responsibility to prepare students for the world of tomorrow.

# CLIMATE CURRICULUM SURVEY RESULTS

Steve Earle, Local 17

Teaching about climate change is important in all disciplines



CASC has surveyed FPSE members about their experiences with teaching or discussing climate change. Some of the preliminary results from that survey are illustrated here. A large majority of those surveyed did include something on climate change in their classrooms, and most indicated that it is important to teach climate change in their own discipline and in all disciplines at our institutions. Most also acknowledged that they would feel more comfortable discussing climate change if they had more background knowledge and more resources.

**Some responses to the survey prompt:**  
**Briefly describe any innovative approaches that you are using to bring climate-change awareness and knowledge to your students.**

**I teach Carpentry and building science** which is heavily influenced by climate change. There have been many changes to the British Columbia Building Code (BCBC) in recent years, including Step Code, which mandates that all buildings in BC will be required to be Net Zero Energy Ready by the year 2032.

**To highlight the severity of unchecked climate change**, my classes have looked at next stage consequences of water, food, or power, including migration and increased risks of conflict. We've also looked at sustainability programmes to see if they contain any material on how e.g. hospitality and tourism businesses can prepare for the increased number of climate-related disasters they will face. None of these issues are covered in current curriculum.

**We do a class on Disaster Nursing** which speaks to the nursing role in disasters whether natural or other and we also do a class on SDG's and the role that nurses take in supporting/achieving these.

**We are working to produce a lab** that would illustrate the process of carbon dioxide capture.

**I teach entrepreneurship-type classes** and ALL of the stories and examples I use in some way demonstrate an example of a response to climate change. The idea is to demonstrate that responding to climate change is not only desirable and interesting, but it's also viable and a clear demonstration of our capacity to change. While investigating the notion of what we consider success, I try to clearly quash the notion that there is an inverse relationship between economic performance and environmental legislation.

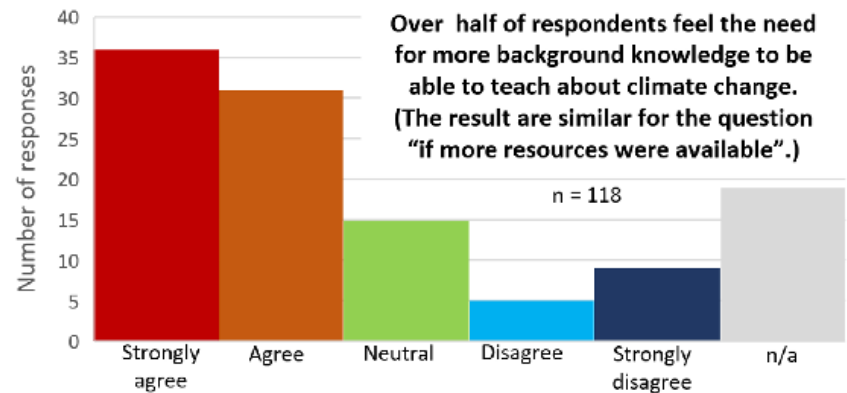
**I discuss personal methods espoused in ecological philosophies** for developing connection with and appreciation for nature. This includes things like nature meditations, philosophical discussions on our relationship to nature, noting consumption habits, remembering childhood experiences of nature, etc. All of these are geared towards motivating behaviours that have a more positive impact on the ecology.

**We cover the environment as a major determinant of population health** and as related to the WHO Sustainable Development Goals. For example, we look at disaster preparedness, responding to extreme weather events and the health risks they introduce: wildfires & air quality, flooding & communicable diseases, heat & cardiovascular risks, sea level rise & housing insecurity, habitat/biodiversity loss & zoonotic diseases etc.

**I teach Gender, Sexualities, Women's Studies** in Interdisciplinary Studies. I teach an ecofeminism course, and we do quite a bit of work on climate change. We do discourse analysis and we also look at "petro masculinities."

**I address the circular flow model with economy**, the alternative diagram by Kate Raworth which includes the environmental limitations. I introduce the UN's Sustainable Development Goals in the course and link the importance of the environment to the economic capacity. I have mentioned work on macroeconomic models and the carbon budget or limit. I also bring to their attention positive work such as Project Drawdown.

I would feel more comfortable teaching about climate change if I had more background knowledge

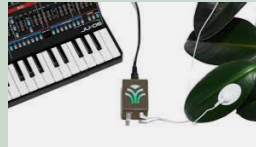


# TEACHING CLIMATE CHANGE

## KPU's CLIMATE+ CHALLENGE

more tips!!

We're working toward climate solutions and reconciliation. This began late 2020/early 2021 with 2-3 faculty members (in Policy/Journalism) and then some Geography faculty came on-board. In Fall 2022, the team expanded to 8-10 faculty to also include English, Public relations/Business, Indigenous studies, Design, and Teaching and Learning. We host events – some are drop in and others are by registration (e.g. 6 March land defenders). We've a regular book club, a climate-library and we run biweekly, online Climate+Coffee sessions for Faculty & monthly Climate+ Cafés for students/ staff and faculty to meet up and know they can ask questions in a climate-safe share space. Each term, we highlight the Climate+ intersectional-relevant courses so students and faculty can see

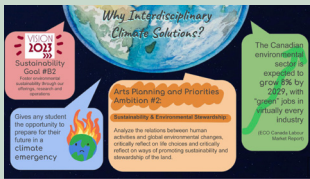


## MUSIC

Introduce students to experimental projects in translating plant biorhythms into music via MIDI boards.

## ARTIFICIAL INTELLIGENCE

Earth Species Project uses AI to attempt to decode communications of more-than-human species. Links to bioacoustics and behavioral ecology research and solar timing and those triggers do not advance similarly with climate change.



what's on offer and how the curriculum crosses disciplines. We're developing new courses, credentials and more importantly, looking at ways for students to explore what their own climate-relevant specialisations might be.

## INDIGENOUS EPISTEMOLOGIES

In my courses, I invite students to think about co-existing and sharing responsibility toward humans and more than human entities. Drawing from Indigenous epistemologies, students embrace a view of all world relations, relationality, interdependencies, and interconnectedness of nature, humans, and culture. By providing recycled materials and natural materials for my students to make teaching resources, showing videos on climate action, and assigning readings that highlight current issues related to climate justice, I ask students to become activists and advocates and use education to create a better world.

# SHARING ACTIVIST STORIES WITH STUDENTS

Kim Trainor, Local 04

I share with my students stories of my own experiences of participating in blockades at Fairy Creek, staging civil disobedience actions in defence of old growth forests, and witnessing sentencing in the court system, which continues to use injunctions to support industry over First Nations on their ancestral lands. Below is a photograph of a rally prior to a recent Supreme Court sentencing trial in Kamloops where Secwepémc matriarch Miranda Dick and Hereditary Chief Sawwes (both pictured below), along with four settler allies, were sentenced to 28 days each in jail for performing ceremony on traditional Secwepémc land, allegedly disrupting a "shift change" for TMX workers at the Kamloops airport. I share these stories with my students to illustrate the real-life implications of the ongoing support by government of the fossil fuel industry on peoples and environments. I hope to encourage my students to feel informed of the current climate crisis as it plays out in so-called British Columbia, and empowered to take action.

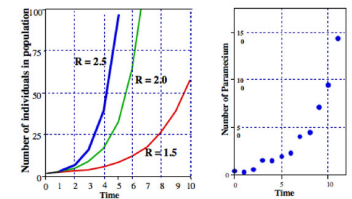


# REDEFINING BOUNDARIES FOR TEACHING CLIMATE CHANGE

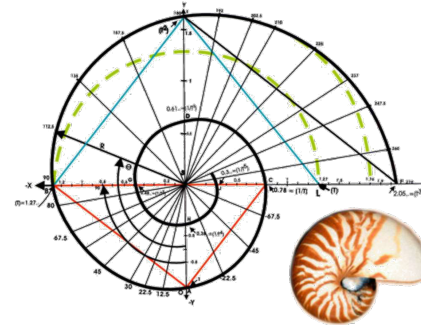
Skye Richards, Local 15

Over my years of teaching, and even as a pre-service teacher, I looked for ways of engaging students in ways that could lend themselves to do more to connect relevancy to their learning. My first real battle, as a budding teacher-in-training, was my collision with barriers set against me, as a math and science teacher, to enroll in a course labelled "Drama Across the Curriculum". I won the argument, with help from my faculty advisor. Often it feels challenging to bring in practices outside of the margins; we have been convinced to silo our topics and disciplines, and it can feel a little daunting at first. I would like to encourage all educators to step outside, quite literally, of that mindset. There is fun and many rewards to the learning process in loosening the reigns and it also could be a great way to collaborate beyond the subsets.

In beginning this work, I recognized I needed to identify areas of the curriculum I teach in order to shift the pedagogy. For example, in my Grade 12 ABE course I identified two areas with potential to bring in a huge array of topics related to climate education. Inverse function and Sequences and Series are two of the easier ones. Exponential Functions lend themselves to deepening the studies of population increases and declines by broadening discussion with peer teaching projects, group presentations, or research essays. Similarly, Logarithmic Function can draw connections to geosciences, from earthquakes around fracking wells to the potential of developing clean energy sources around geothermal heating vents and subduction zones located near coral reefs whose protection may be in conflict with such development.



Equally suited to exploration and critical thinking about climate-related topics, studying patterns in nature brings in a real relevance to sequences and series, which can have students delving into relationships between fractals and ferns, golden ratios and shells, global weather patterns and human migration--simply by having an assignment in which students can create a survey and collect data or make up a game with relevance to marketing, agribusiness, waste streams, distribution, and consumption challenges. If, as 'the instructor', we take ourselves out of being central to the education and reassign our role as guides that nurture true exploration, we too are freer to create opportunities to learn together and empower our students.



## ECONOMICS

Conventional economics is flawed -- we need to switch to ecological economics, steady-state economic model (not reliant in greed and infinite growth). Explorations of how political ideologies influence decisions about climate change and the activities that cause it.

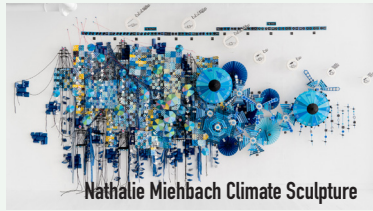


### BUSINESS MANAGEMENT

Students do a research paper with the topic "Are we reaching the Sustainable Development Goals?"

## ECOLOGY

In our TRU ecology lab students studied the effect of a recent grassland fire in Kamloops. Will the same plants return and at what rate with climate change also acting on this recolonization?



## CLIMATE CHANGE THEATRE

### OFFICE ADMINISTRATION

We have an office simulation which has some tasks related to students organizing a mock meeting or conference for their sample business, which is a catering company. Students "organize" a local small conference on sustainability in the restaurant industry, including producing a short report.



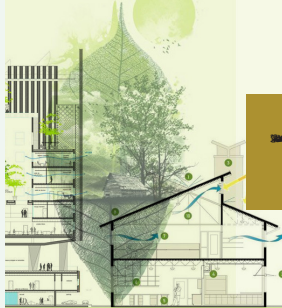
## ALL THE ARTS

Visuals can provide an immediate and visceral understanding of the scale of anthropogenic impacts on the planet. The role of art, graphic art, narrative, theatre, poetry, and song tap into emotional responses.

## GREEN BUILDING DESIGN

**NET ZERO** Incorporating near-net zero energy home building principles and practices into my curriculum, based on the new 2020 National Building code. By the year 2032 all buildings in BC must be built to near-net-zero-energy ready standards.

Passive solar design, low energy building, urban planning for sustainable communities.



## BOTANY

Explore plant adaptations to climate change.

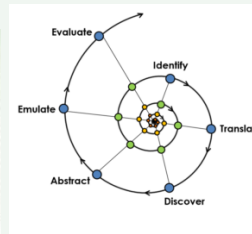
## RENEWABLE ENERGY

Renewable energy systems are founded on electrical/electronic systems (Camosun).

This has now been incorporated into 'Electronics and renewable energy program' as well as vehicle (cars, ships, planes) electrification.



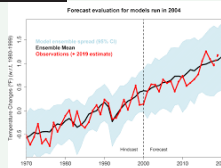
## TEACHING CLIMATE CHANGE



## BIOMIMICRY

learning from nature to design sustainable technologies/solutions - lots of examples to research and present findings to class in a student presentation. Role of plants/trees in climate regulation.

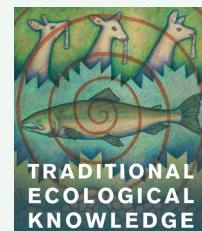
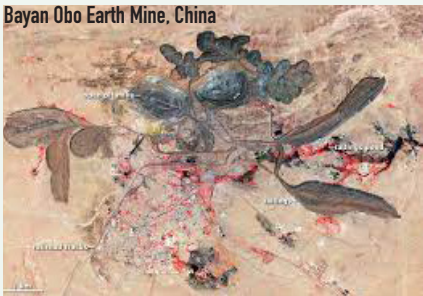
**STEM** Math, physics, and computer science are all used together in making climate models, can also be used to model efficient buildings etc. Simple example: calculate the carbon stored in a single tree. More complex: Demonstrate the effects of positive feedback and how these may drive climate change.



## EARTH SCIENCES

I want students to think about the options that we have to reduce our climate impacts. The most important change we can make is to drive less, but many people in Canada have no option but to drive. Are electric cars a good alternative? I think so, but following the UN's Sustainable Development Goal 12 of 'ensuring sustainable consumption and production' I ask my students to research the supply chains for the materials that are needed to make batteries for electric vehicles, and to consider if mining of metals like lithium, cobalt, nickel and copper is sustainable in the various places where it is carried out.

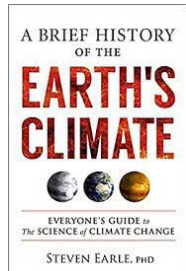
Bayan Obo Earth Mine, China



## INDIGENOUS KNOWLEDGE

Invite knowledge holders and elders to speak to our students. Incorporate stories of Indigenous protests against resource extraction. Teach FPIC, UNDRIP, BCDRIIP.

## BOOKS



Earle, Steve. *A Brief History of Earth's Climate: Everyone's Guide to the Science of Climate Change*. New Society Publishers, 2021.

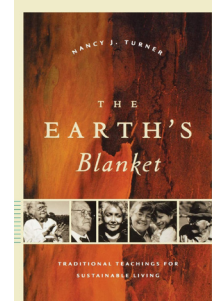
Garrard, Greg. *Ecocriticism*. Routledge, 2011.

Kimmerer, Robin Wall. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*. Milkweed, 2015.

Kimmerer, Robin Wall. *Gathering Moss: A Natural and Cultural History of Mosses*. Oregon State UP, 2003.

Nelson, Melissa K. & Dan Schilling, eds. *Traditional Ecological Knowledge: Learning from Indigenous Practices for Environmental Sustainability*. Cambridge UP, 2018.

Ramanathan, V., Aines, R., Auffhammer, M., Barth, M., Cole, J., Forman, F., et al. (2019). *Bending the Curve: Climate Change Solutions*. Location: Regents of the University of California. Retrieved from <https://escholarship.org/uc/item/6kr8p5rq>.



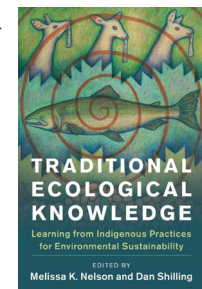
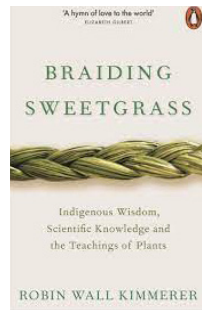
Robinson, Kim Stanley. *The Ministry for the Future*. Orbit, 2021.

Shepardson, Daniel P., Anita Roychoudhury, & Andrew S. Hirsch, eds. *Teaching and Learning about Climate Change: A Framework for Educators*. Routledge, 2017.

Siperstein, Stephen, Shane Hall, & Stephanie Lemenager, eds. *Teaching Climate Change in the Humanities*. Routledge, 2017.

Turner, Nancy. *The Earth's Blanket*. Douglas & McIntyre, 2005.

Young, Rebecca L. *Confronting Climate Crises through Education: Reading Our Way Forward*. Lexington Books, 2018.



## WEB RESOURCES

All project to decode communication of other species: <https://www.earthspecies.org>



Artists and Climate Change: Building Earth Connections. <https://artistsandclimatechange.com/degree-programs-in-the-arts-and-climate-change/>

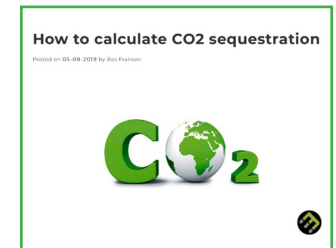
BC Ministry for Education. 2007. Environmental Learning and Experience: An Interdisciplinary Guide for Teachers. <https://drive.google.com/file/d/19zbMp0wJSQ8KA2n-6VTiSCr24-clOa-kS/view>

Biomimicry in design: <https://biomimicry.org/>

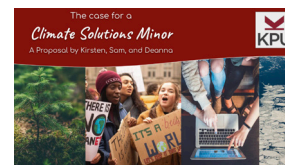
Calculating carbon stored/sequestered in a tree (good for bio, math, ecology classes etc.): <https://www.ecomatcher.com/how-to-calculate-co2-sequestration/>

Climate and systems thinking (big picture and interactions): <https://www.climateinteractive.org/>

Climate Education Reform BC <https://www.climateeducationreformbc.ca/> current updates [https://mailchi.mp/15e95fbd3a05/campaign-update?fbclid=IwAR2kCjurNtKUGhK75M4qllOscaxKCKq28BliaFp\\_djgTmvXmhUBaqA13PZA](https://mailchi.mp/15e95fbd3a05/campaign-update?fbclid=IwAR2kCjurNtKUGhK75M4qllOscaxKCKq28BliaFp_djgTmvXmhUBaqA13PZA)



Climate solutions: <https://drawdown.org/climate-solutions-101>



Ecological economics - System change at the highest level: <https://www.resilience.org/stories/2022-07-26/ecological-economics-an-introduction/>

KPU Climate+ (intersectional) relevant courses, Spring 2023: <https://wordpress.kpu.ca/climatepluschallenge/courses/spring-2023-courses/>

KPU / The Case for a Climate Solutions Minor / Student Proposal: <https://wordpress.kpu.ca/climatepluschallenge/2022/02/16/climate-solutions-minor-proposal/>

