From the level of international treaties all the way down to the realities in the classroom, there remains a serious gap between the understood importance of education in climate policy and the actual attention to climate change in our education system. This paper will look at why climate change education is important, highlight key aspects to consider regarding how climate change is taught, provide a summary of how each province is doing, and end on key recommendations for the incorporation of climate change education in Canadian schools.
Where We Stand: The Integration of Climate Change Education in Canadian Schools

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Executive Summary

Despite calls to enhance the climate change education offered to students across Canada, the curriculum in many jurisdictions continues to fall short. While the state of the curricula varies from province to province (see Section 3), there are clear trends that curricula across the country is lacking on the subjects of the scientific consensus on climate change, impacts and future risks due to climate change, and adaptation and mitigation options.¹

In addition to the mere presence of climate change content, it is critical that this curricula moves beyond the mindset of individual action to address the need for systemic change. This can be addressed by learning about climate change in both science and humanity classes, so fact and debate can be easily delineated, discussing the ties between inequality and the impacts of climate change, drawing on Indigenous knowledge and stewardship practices in a school’s area, and utilizing context specific data and information to tie student’s learning to their own communities. While there are some inspiring examples of teachers incorporating experiential learning, Indigenous community perspectives, and student empowerment into their teaching, the majority of teachers continue to feel that they lack the support and resources to properly address climate change in their classes.² While resources offered by non-profits fill this gap in some parts of the country, teachers should not have to rely on such materials. There is a clear need for teachers to be offered more professional development opportunities related to climate change and resources from the provinces to stay up to date with technological advances and make the best use of local data and information.

Climate change education is a crucial piece of climate action. We know that climate change will come to affect all aspects of our lives and our future decision making. This embedded nature must be reflected in the education we offer our students, tying together everything from ecosystems to development, history, and inequality. This education not only fosters an informed citizenry, but empowers students to innovate and push for change in their communities.
Both within Canada and internationally, foundational climate policy documents recognize that education on climate change is a key part of tackling our global climate crisis and pursuing Sustainable Development Goal (SDG) 13, climate action. As a signatory to the Paris Agreement, Canada has made a commitment on the international stage to enhance climate change education.³ Article 12 of the Paris Agreement⁴ specifically stipulates that, “parties shall cooperate in taking measures, as appropriate, to enhance climate change education.”⁵ The few commitments to environmental citizenship existing in Canadian federal government documents, such as those in the Common Framework of Science Learning Outcomes K-12 (1997), which stipulates that “students will be encouraged to develop attitudes that support the responsible acquisition and application of scientific and technological knowledge to the mutual benefit of self, society, and the environment,” have not translated into intentional changes in the curriculum.⁶ Instead, research has shown that the incorporation of climate change education continues to be added into the curriculum only as an afterthought.⁷ This trend is even starker at the provincial/territorial level, where curriculum is actually developed. Whereas a majority of jurisdictions include education as a part of their plans to address climate change, only six out of the thirteen mention climate change, in terms of curriculum reform or other such action, in their education policies.⁸ From the level of federal policy making and provincial curriculum development, all the way down to the realities in the classroom, research has shown that there remains a serious gap between the understood importance of education in climate policy and actual attention to climate change in our education system.⁹ This paper will look at why climate change education is important, highlight key aspects to consider regarding how climate change is taught, provide a summary of how each province is doing, and end on key recommendations for the incorporation of climate change education in Canadian schools. These findings were generated through policy analysis and a secondary literature review, and seek to give a general overview of the state of climate change curriculum in Canadian schools and not a fully comprehensive review of the inclusion of
climate change related curriculum across the provinces. While the analysis for some provinces, particularly for those with recently amended curriculum, involved the review of current curriculum documents, the review of other provinces relied on existing findings and summations of the curricula.

First, why? Addressing climate change involves pursuing actions with short-term costs for long-term gain. Thus, ensuring continued political will for ambitious policy is going to require a citizenry that is informed and willing to enact behavioural changes.¹⁰ National surveys have shown that while Canadians generally accept that climate change exists, the understanding that it is caused by humans is still not as widely accepted.¹¹ There also remains a gap between Canadians’ high level of concern and their actual level of knowledge in regards to climate change.¹² Comprehensive education on climate change can help Canadians move from being concerned to empowered. Education is a key aspect of handling the climate crisis, not only because of the need for sociocultural and micro-behavioural shifts, but also to create an engaged and empowered citizenry, ready to navigate the choices and challenges ahead.

Pressure for curriculum change has also come from students across Canada. In workshops with students in Alberta, the Alberta Council for Environmental Education found that there was a gap between the education that these students received and the information that they wanted on energy and the environment, making them feel that they lacked the information and power to act.¹³ A group of secondary students in BC have turned this discontent into activism, creating the student-led movement “Climate Education Reform BC.”¹⁴ Their campaign advocates for curriculum revision, the provision of more professional development opportunities for teachers, and the creation of a youth committee to ensure accountability and provide feedback.¹⁵ Thus, youth, who have shown themselves to be particularly forceful in the climate action movement, have added their voices to the call for more holistic climate change education.
SECTION 2

The Devil in the Details: Key Aspects of Incorporating Climate Change into the Curriculum

A. Curriculum Development

There is strong reason to believe that climate change education is still highly dependent on the capacities and inclinations of individual teachers. This is largely due to a lack of specificity in the curriculum when it comes to climate change and a lack of resources and professional development opportunities for teachers. Teachers have noted that despite their desire to provide climate change education, they face a lack of time to incorporate extra material into an already demanding curriculum. Since this system puts the onus largely on teachers, those in school systems that are already underfunded or lacking in resources will face additional challenges trying to incorporate climate change education into their classes. At the provincial level, addressing this gap requires collaboration between the ministries of education and those of environment and climate change to embed climate change more explicitly into the curriculum. Given the constant advancements in science related to climate change, this collaboration needs to be ongoing to allow for frequent revisions that keep the curriculum up to date.

Canadian Example: An approach used by some teachers in the Durham District School Board works by embedding climate change education in earth science curriculum as an overarching trend. One lesson tract created for high school students uses IPCC reports and the Ontario Government’s Climate Change Action Plan (2007) as key texts for analysis. By allowing students to see global processes impact places at the local level through region-specific data, students are encouraged to ask questions related to the relationships between the province’s GHG emission levels and economic development, population growth, and government policies. This holistic approach pushes students to consider both the causes of climate change and the diverse mitigation and adaptation strategies available to their communities.

B. What Frameworks do Teachers Use

When developing curriculum, the framing of climate change, especially when discussing solutions, is critical. While there are different terms to refer to different types of
environmentalism and policy discourses, the key distinction to note is between a discourse that is individual and market-based versus one that sees climate change as requiring systemic change. For example, “market environmentalism” and “smart growth reformers” tend to prioritize market-based solutions and the importance of individual voluntary action over collective action and government intervention. This view emphasizes that social change is just the aggregate of individual behaviour and that focusing on individual changes is sufficient. In contrast, a “ecological modernist” view focuses on social innovation and government investment in technology and other state intervention while “ecological activists” believe in the need for grassroots movements and larger systematic change. This view is more likely to also take on a social justice lens that examines climate change as an issue of power and identity, as well as public health. Through such a framework, teachers can address the values of justice and equity in climate action by examining the ways in which climate change furthers social disparities and often has the greatest impact on marginalized groups.

A curriculum that prioritizes the role of individual action and the power of the markets underestimates the depth of change required to reduce emissions at the rates that are required. Discourses that evade addressing the need for government-coordinated system change fall short of providing a clear picture of the challenges posed by the climate crisis.

**C. Curriculum in both sciences and humanity-based classes**

We need to conceptualize climate change curricula as two-sided. The first side is the science of the issue, understanding how climate change works, that it is human caused, that there is scientific consensus on these facts, and the risks that we, as humankind, face as it progresses. The second side is ‘how we address this issue,’ which is more appropriate for humanity-based discussions on global citizenship, social justice, and government policy. It is critical that this second side is seen as separate from the first to not conflate what is debatable (policy solutions) and what is not (scientific consensus). Introducing the interactions between social justice and climate action is particularly crucial given the way climate change will further exacerbate our societies numerous inequities. Furthermore, it
is important that discussions of climate change move beyond the science to look at and discuss our role in working towards a solution. A blending of these two sides has led some teachers, in an effort to show a balanced and unbiased picture, to mistakenly convey that the science on climate change is up for debate. In curriculum development, there tends to be a focus on balance instead of evidence when it comes to hot-topics to give room for students to decide the merits of each argument for themselves. However, in a topic that holds wide scientific consensus, this tactic is counterproductive since it creates the illusion of disagreement on the science where very little exists. This can be particularly confusing for students if various viewpoints are given equal weight and allowed to veil scientific facts, especially when these topics are addressed in a science class. For example, in Manitoba, Newfoundland, and Prince Edward Island, curriculum documents convey disagreement within the scientific community over climate change, more so than exists in reality, and encourage debate on the subject. Furthermore, a national study found that a third of teachers were open to students debating the causes of climate change instead of presenting it as human-caused. Such obfuscation makes evident the importance of differentiating between scientific arguments and political ones.

This distinction between the science and politics of climate change could be achieved by either splitting curriculum between science and humanity-based courses or tackling the subject in a dedicated course or unit on climate change, that starts with the science and then moves to talking about possible solutions and political arguments. Some schools also opt to make climate change a key theme throughout the year. Such an integrated approach, by focusing on the ways in which climate change touches all aspects of our lives and the interconnections between the social and environmental, could better allow schools to incorporate context-based content that draws on Indigenous knowledge, particularly in the realms of environmental stewardship, cooperation, and problem solving. The decision between these three approaches should be made based on the competencies of teachers and the ability of the province to provide proper training. While there are clear benefits to having a dedicated course on climate change, more integrated approaches have their own benefits if teachers are provided with the proper interdisciplinary training and resources.
D. Providing Resources to Teachers

Budget cuts and limitations in the materials provided to teachers have led many to rely on resource packages and other informational guides from various non-profits. In British Columbia, the Canadian Centre for Policy Alternatives’ Climate Justice Project has created “Climate Justice in BC: Lessons for Transformation,” a resource package for teachers with classroom-ready materials to engage students in discussions on the intersection between climate action and social justice. Based on BC’s local communities, the package ties together the issues of climate change and rising inequality as it focuses on allowing students an opportunity to re-imagine the systems around them. While it is tied to prescribed learning outcomes in the BC Curriculum, it provides teachers with the background to tie climate justice to BC’s communities, ecology, history, and economy.

Similarly, the Yukon First Nations Curriculum Working Group created a Cross-Curricular Unit on Climate Change for Grade 8 and 9 that tied climate change discussions to Yukon First Nations ways of knowing and doing to better understand the implications of climate change and the action required to address it. Of particular interest, the unit provides multiple ideas for local inquiry based experiential activities, draws on traditional knowledge to investigate local changes, and urges educators to collaborate with their local First Nations communities. Such efforts also highlight the importance of curriculum development prioritizing local context based material that connects students to the land and its history. Other organizations include Learning for a Sustainable Future, which publishes resource books for teachers, and Ontario EcoSchools, which runs a certification program for schools and provides both professional development opportunities and education resources to teachers.

While some of these organizations do an admirable job of filling a gap and supporting teachers with contextualized resources for their province, such resources must be examined with a critical eye. In Saskatchewan there are six third-party organizations that have developed curriculum resources, provided professional development opportunities, and delivered programming directly in schools, whose background should make us question their involvement. These groups are largely funded by the oil industry and their outsized influence on climate change education in the province has led to the predominant promotion of market-based environmentalism and the role of individual action. Accusations of anti-energy bias in school curriculum have allowed these organizations to swoop in with ‘bias-balanced’ materials, which give as much weight to industry perspectives as evidence-based environmental concerns. As discussed earlier, this is problematic because it blends the politics and the science of the issue. Since teachers are eager to use these resources, especially the professional development opportunities and funding for excursions, since they lack funding to pursue such opportunities otherwise, it has made teachers feel pressured to always include an industry perspective in their discussions on climate change. While Saskatchewan has one of the most robust and comprehensive climate change curricula in the country, as will be discussed more in the next section, reliance on ‘bias-balanced’ materials reveals that it is not just the presence of curriculum that matters, but also how it is taught.
E. Beyond the Basics

As alluded to throughout the previous four sections, it is important to address through climate change education the interconnections between the environment and our society. It is impossible to fully understand the causes and impacts of climate change unless you account for social and ecological contexts such as the wealth gap, gender inequalities, socio-economic conditions, and histories of colonialism. Climate touches all aspects of our lives, including health, power, wealth, identity, and security, and touches upon the foundation of our sense of justice and equity. Seeing climate change as separate from our culture and societal structure is ignoring a fundamental aspect of this crisis. Instead, we must help students to see how human ecology is both shaped by and embedded in global ecosystems. When examining issues such as the causes and impacts of climate change, it is crucial that students are challenged to examine who is most affected by climate change and how these groups are often marginalized and hold the least responsibility for causing climate change. For example, numerous studies have shown that, due to a wide host of reasons, women and girls face a disproportionately negative impact due to climate change. Examples such as heat waves, now a lived experience for many, can similarly illustrate the higher impact of climate change on the elderly, particularly those lacking in resources. Such examples show that it is essential that students are taught how to consider climate change from a gender-sensitive intersectional lens.

While this education can tie into global and national patterns, it needs to also connect to communities and local contexts. Indigenous knowledge and practices have already been lauded as crucial in our efforts at mitigation and adaptation in Canada. The Yukon First Nations Curriculum Working Group's Cross-Curricular Unit aptly summarizes how this knowledge is also crucial for climate change education: “Students will inquire into the necessary skills for adapting to and reducing climate changes, taking lessons from Yukon First Nations who have faced vast environmental and social changes with the strength, resiliency, and persistence needed for survival.” By connecting with Indigenous leaders and elders through learning about environmental stewardship, schools create an opportunity for students to not only improve their understanding of climate change, but also gain an appreciation for the history of the land they live on and the histories, both pre- and post-colonialism, that have shaped it.

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Example: For one elementary school teacher, considering the impacts on the North and incorporating Indigenous knowledge were integral parts of her approach to discussing climate change with her students. She drew on her teaching connections with Nunavut to connect her lessons with concepts of environmental stewardship, cooperation, and problem solving, all critical skills that have been emphasized throughout Inuit culture for generations. She utilized role-playing exercises, such as one in which her elementary class took the role of a caribou herd facing mounting challenges to their annual migration across the tundra, to initiate conversations about environmental issues in the region and connect development, climate, habitat, and Indigenous knowledge.
SECTION 3

Where the Provinces Stand

On a province-by-province level, we will now look at how each jurisdiction is incorporating climate action education into their curricula. Since education policies, most notably curriculum development, occur on the provincial level, it is important to see how each jurisdiction is enacting improvements to their climate change education. The territories and the smaller jurisdictions largely base their curricula on the other provinces and thus will not be addressed separately. However, as seen by the example of the Yukon First Nations Curriculum Working Group’s Cross-Curricular Unit on Climate Change, this curriculum can and should be supplemented with locally created content, allowing education to be better tied to local contexts, communities, and history.⁵⁰

First, a look at climate education statistics in Canada. In 2020, 35-59% of teachers reported teaching climate change in the classroom, most for about one to ten hours per year or semester.⁵¹ Only 32-33% said they felt like they had the knowledge or skills to teach climate change, noting barriers such as lack of time, resources, and professional knowledge.⁵² Overall, a lack of clear policy left decisions regarding climate change up to individual teachers. A paper by Wynes and Nicholas (2019) evaluated curriculum by dividing the possible focuses of climate change curriculum into six core topics:⁵³

1. How the climate works (introducing the science of the earth’s climate)
2. It’s warming (recognizing that climate is overall getting warmer)
3. It’s us (explaining that humans are causing climate change)
4. Experts agree (accepting that there is scientific consensus on climate science)
5. It’s bad (understanding the damage climate change could cause)
6. We can fix it (examining policy options to address climate change)

They then evaluated how well each province covered each of these topics. Overall, they found that curricula across Canada failed to convey the impacts of and possible solutions
for climate change, and only one province emphasized the scientific consensus in their curriculum. The lack of attention to the impacts of climate change suggests that sub-topics in this area, such as the unequal effects of these changes, particularly on marginalized communities, are not given due attention.

**Ontario**

Ontario has included some substantive content on climate change in their education policies, with a generally ecological modernist approach that emphasizes technology and innovation but also includes aspects of climate justice. While climate change is most explicitly included in the Grade 10 Applied Science course, it is connected to subject-specific learning outcomes in both science and humanity based courses. Of the six core topics delineated by Wynes and Nicholas’ study, they addressed five of the six topics, all but expert agreement.

**Quebec**

Quebec also touches upon the same five core topics as Ontario in its curriculum (all but expert agreement), but does not have as strong of an emphasis on impacts and solutions. This is an improvement from 2017, when its curriculum had little concrete connection to climate change education. The curriculum uses a mix of ecological modernist and smart growth approaches, focusing on renewable energy sources, social innovations, and emissions trading. However, the province has been critiqued for not providing teachers with enough resources or training in the field of climate change.

**Manitoba**

Of the six core topics, Manitoba only addresses three in its curriculum, lacking reference to the fact that the climate is warming, any solutions, and the existence of expert consensus. Their approach is also a mix of ecomodernist and smart growth. Despite their current shortcomings, the province has one of the more ambitious plans in the nation to incorporate more climate change education into their curriculum.

**British Columbia**

British Columbia (BC) covers the same three core topics as Manitoba, how the climate works, human-induced cause, and the impact it will have. BC’s climate action plan has made engaging with climate a priority for K-12 education. While climate change is incorporated into curriculum throughout the grades, including particular high school elective courses, the basics of the science of climate change and the human response is divided neatly between the Grade 7 Science and Grade 7 Social Studies courses.

**Case Study: BC’s Climate Curriculum**

One of the key units for Science 7 in BC is “earth and its climate have changed over time.” Teachers are expected to cover the “evidence of climate change” and “the recent impact of humans.” As stated above, these inclusions clearly cover the topics of how the climate works and that humans are causing climate change. The Social Studies curriculum for Grade 7 then looks at how humans have adapted to challenges in the past regarding the climate, but doesn’t require teachers to discuss responses to the current climate crisis.
Climate change is also discussed in the Grade 11 elective courses Science for Citizens 11 and Earth Sciences 11. While Earth Sciences 11 delves into climate science and the evidence and effects of climate change, Science for Citizens 11 just touches on human’s impact on the climate and the potential effects of climate change.

A study has shown that the policy discourse in BC’s curriculum includes aspects of both smart growth and ecological modernization approaches, meaning that it combines market-based solutions, individual action, and the role of government intervention. Yet the curriculum also lacks room to focus on policy responses to climate change, which is the core of climate action. The curriculum also fails to focus on green activism and ideas of systemic change that could empower youth to push for deep societal change through climate action. While providing students with foundational knowledge on climate change is important, the curriculum doesn’t help students make the jump from knowledge to action.

Saskatchewan

As noted earlier, Saskatchewan has one of the most comprehensive climate change curricula in place, addressing every core topic fairly well. This has surprised some researchers given that Saskatchewan has the highest per capita greenhouse gas emissions in Canada due to its fossil fuel extraction, showing that there is not necessarily a link between political conservatism and the presence of climate change curriculum. While climate change is covered heavily in the required course Science 10, it has not been significantly incorporated into any social science curriculum where ideas of climate justice can be most effectively addressed. Such discussion in humanity based courses would better allow for discussion on connections between the changing climate, local history and context, rising inequality, and existing power structures.

Alberta

While Alberta’s curriculum is not particularly strong in any of the six areas, it does touch on all besides the scientific consensus and solutions. In a particularly telling remark, Alberta Education Minister Adriana LaGrange endorsed a report in 2020 that recommended that students learn all views about climate change in conjunction with the value of the province’s oil and gas sector. A local non-profit, Alberta Council for Environmental Education, found through workshops with students that most students were unsatisfied with the degree to which climate curriculum was incorporated into their education and felt that they lacked the knowledge to act.

Global Example: CAMFED, an organization that supports girls in Ghana, Malawi, Tanzania, Zambia, and Zimbabwe to access education, has used peer-to-peer project-based learning in climate-smart agriculture to help students hone their leadership skills through climate activism. Through community workshops, mentoring, and demonstration farms, these projects have not only strengthened the adaptive capacities of their communities, but have also actively contributed to combatting climate change, poverty, and gender inequality.
Canada’s provinces have taken some steps in progressing climate change education. Yet there remains a lack of coordination between climate and education policy makers, as well as insufficient professional development opportunities for teachers. There is also a notable absence of curriculum content related to adaptation, disaster risk reduction, and climate justice which is compounded by the lack of mechanisms to integrate leading-edge science. Additionally, curricula fail to emphasize the strength of the scientific consensus, allowing too much debate on issues that are settled in the scientific community.

With these realities in mind, we present the following recommendations:

- Teachers need to be provided with the professional development opportunities to improve their knowledge and strategies related to teaching climate change.
- Teachers need to be provided with context-specific resources to help them teach climate change, including relevant local, national, and international data.
- Curricula should emphasize that there is scientific consensus on the mechanisms and role of humans in causing climate change.
- More curriculum content is needed regarding the various approaches to climate change policy and possible avenues for addressing climate change, with additional emphasis on structuralist and climate justice approaches (which should incorporate feminist, decolonial, and social justice lenses), in order to empower students and provide needed context on the interconnections between socio-economic structures, colonial legacies, patriarchy, local histories, and climate change.
- Scientific facts and political debates need to be clearly separated in the curriculum so that students understand what is fact and what is a political view, ideally through coordinated placement in both the science and humanity curricula.
• Alternatively, if there is a single class or unit that focuses on climate change, it should be organized to begin with the science and then move to political debates

• The ministries of education and ministries of the environment in each province should pursue ongoing collaboration to ensure that cutting-edge science and ideas are incorporated into curricula and that the commitments made towards climate change education in climate policy are realized

• Curricula and other resources for teachers should clearly delineate fact from areas that are up for debate, particularly so teachers don’t feel pressured into using ‘bias-balanced’ materials

• Curriculum changes should be created with youth empowerment in mind, giving students an opportunity to innovate and share their ideas, and paired with avenues for students to act as climate change leaders in their communities through after-school options

• Curricula should be developed in collaboration with Indigenous communities in a way that emphasizes the value of Indigenous knowledge and practices in the realms of environmental stewardship and ongoing innovation for climate action

• Curricula should include information and tools, such as the Government of Canada’s free online Gender-Based Analysis+ course, that will allow students to analyse the differential impacts of climate change on marginalized and underrepresented groups

• The ministries of education should establish channels through which teachers across Canada can discuss best practices, teaching tools, resources, class activities, and other useful information for the teaching of climate change to encourage strategies that promote critical enquiry among students and innovative ideas

• Curriculum development on climate change should draw on the expertise of climate leaders from a variety of backgrounds to ensure a holistic approach
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42. Wynes and Nicholas, “Climate Science Curricula in Canadian Secondary Schools.”
44. Ibid.
45. Ibid.
47. The Government of Canada has a free open-access
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course, Gender-based Analysis Plus, that could provide a foundation for students and teaching in utilizing a feminist and intersectionalist lens while studying climate change.

51. Field, Schwartzberg, Berger and Gawron, “Climate Change Education in the Canadian Classroom.”
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The British Columbia Council for International Cooperation (BCCIC) is a coalition of over 140 individuals and civil society organizations that has engaged in sustainable development and environmental issues for 30 years.

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