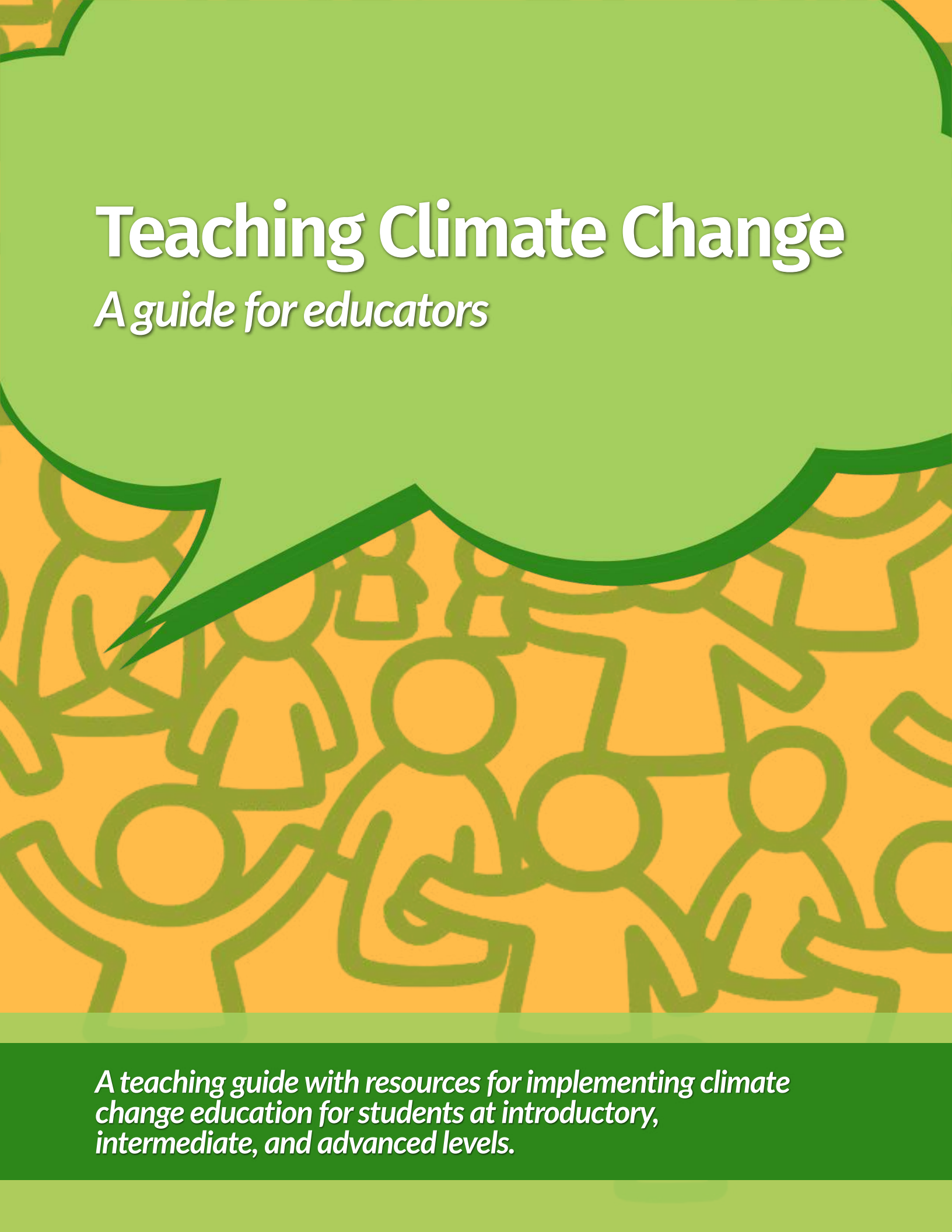




# Teaching Climate Change

*A guide for educators*

*A teaching guide with resources for implementing climate change education for students at introductory, intermediate, and advanced levels.*

# TEACHING CLIMATE CHANGE

A guide to climate change education at all levels.



THE UNIVERSITY OF  
**WINNIPEG**

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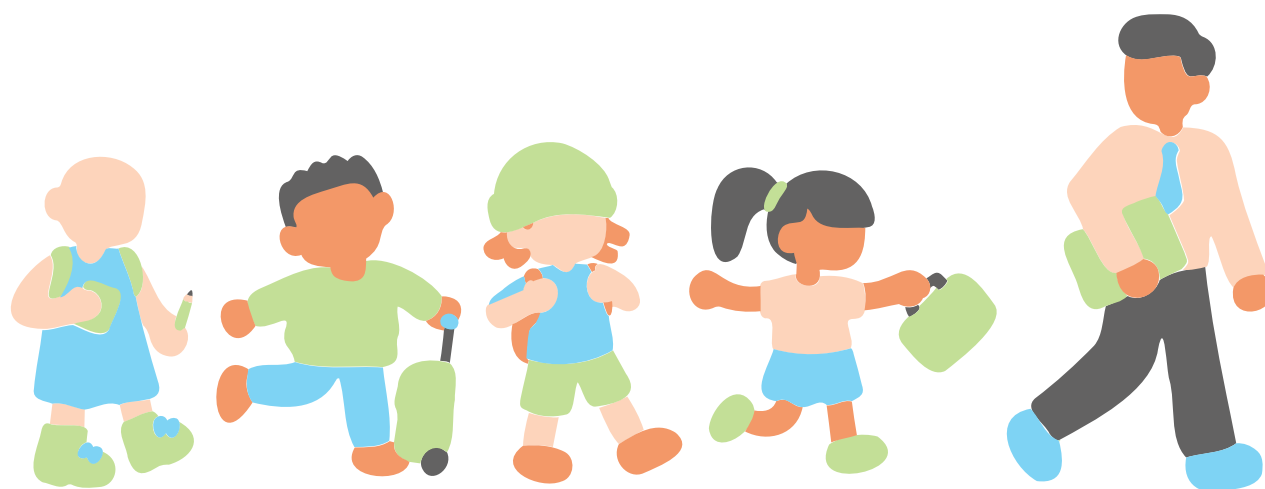
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# Introduction to the Guide

Teaching climate change today involves more than presenting scientific facts alone. It requires adaptable approaches that meet learners where they are at. Across classrooms, schools, and regions, students bring diverse levels of familiarity with climate change. These differences are shaped by a variety of factors such as curriculum priorities, community contexts, access to resources, and lived experiences. As a result, age or grade level alone is not a reliable indicator of a learner's understanding of climate change.

Across Canada, education systems are increasingly emphasizing the development of broad transferable competencies such as critical thinking, communication, collaboration, and global citizenship. Frameworks from organizations like Manitoba Education highlight the importance of preparing learners to engage with complex, real-world challenges.

Climate change education is part of this shift. It offers a meaningful context for students to develop these competencies while exploring one of the most pressing issues of our time. Teaching climate change is not only about understanding environmental science, it is also about supporting students in becoming informed, thoughtful, and engaged citizens.



# Background

There is overwhelming scientific consensus that climate change is occurring as a result of human activities. Its impacts are already being experienced across Canada and around the world, making it an important and relevant topic in modern education. Understanding climate change requires engaging with complex systems, different perspectives, and constantly evolving knowledge.

This guide is designed to help educators navigate this complexity. Rather than organizing content by grade, it offers flexible entry points based on levels of familiarity with climate change: introductory, intermediate, and advanced. This approach recognizes that within a single classroom, some students may be encountering climate change for the first time, while others are ready to explore systems thinking, policy discussions, or more complex climate solutions. It also acknowledges that educators themselves bring varying levels of confidence and experience to the topic.

# Purpose

The purpose of this guide is to support educators in initiating and deepening climate change learning in ways that are accessible, inclusive, and meaningful to their learners. Whether introducing foundational concepts, deepening existing understanding, or facilitating more complex discussions, this guide emphasizes adaptability and responsiveness to diverse learning contexts.

Teaching climate change is not only about knowledge transfer, it is about supporting informed and empowered learners who can think critically, engage thoughtfully, and participate in conversations about a collective future. By offering multiple pathways into climate change education, this guide aims to help educators create learning environments where all students can participate, regardless of where they begin.



# Understanding Learner Readiness

Learners often demonstrate a range of developmental levels that do not align neatly with traditional grade expectations. Their understanding of climate change may vary widely depending on prior exposure, curriculum emphasis, and personal experience. Many students fall between defined levels, showing strengths in some areas while still developing in others. Because of this variability, identifying where to begin can be challenging. A useful starting point is to engage students with open-ended questions to gauge their prior knowledge, awareness, and misconceptions about climate change.



## Assessing Students Entry Level

To identify the level of climate knowledge your student(s) already have, begin with broad, exploratory questions and gradually move toward more complex ones. For example:

- What have you heard about climate change?
- What causes climate change?
- How does climate change affect people or places?
- What actions can individuals or communities take?
- How do systems (political, economic, environmental) influence climate outcomes?

As student responses become less detailed or less confident, this can help indicate their current level of understanding. This informal assessment can guide your choice of entry point.

# Bringing Climate Learning into the Classroom

Translating climate change education into classroom practice involves more than delivering content. It means creating learning experiences that are relevant, engaging, and connected to students' lives. The following principles outlined by Learning for a Sustainable Future can support effective classroom integration:

## Learning Locally

Engaging with the natural, built, and cultural environments of the local community leads to richer and more meaningful learning experiences.

## Integrated Learning

A deeper understanding emerges when learning connects across subjects and incorporates multiple knowledge systems, including environmental, social, and economic perspectives.

## Acting on Learning

Learners apply their knowledge and understanding to improve their communities and enhance their own ways of living.

## Real-world Connections

Learning becomes more valuable when students gather information, communicate with real audiences, and collaborate with their community.

## Considering Alternative Perspectives

Exploring diverse worldviews and knowledge systems helps learners better understand complex issues and outcomes.

## Inquiry

When curiosity drives learning, it opens the door to unexpected discoveries and deeper exploration.

## Sharing Responsibility for Learning

Learners build the skills to take ownership of their learning, extending it beyond the classroom and fostering personal growth.

*Read more: [Connecting the Dots: Key Strategies That Transform Learning for Environmental Education, Citizenship and Sustainability](#)*

# Connecting to Curriculum

Across Canada, curriculum frameworks are commonly organized into four broad categories of knowledge and skills:

- **Knowledge/Understanding** - what students know about climate concepts
- **Thinking** - how students analyze, evaluate, and make connections
- **Communication** - how students express ideas and understanding
- **Application** - how students use their learning in real-world contexts

While terminology and evaluation methods may vary by province or territory, these categories provide a consistent foundation for teaching and assessment.

This guide aligns with these categories by offering opportunities for students to:

- build foundational knowledge
- develop critical and systems thinking
- communicate ideas in diverse ways
- apply learning to real-world contexts

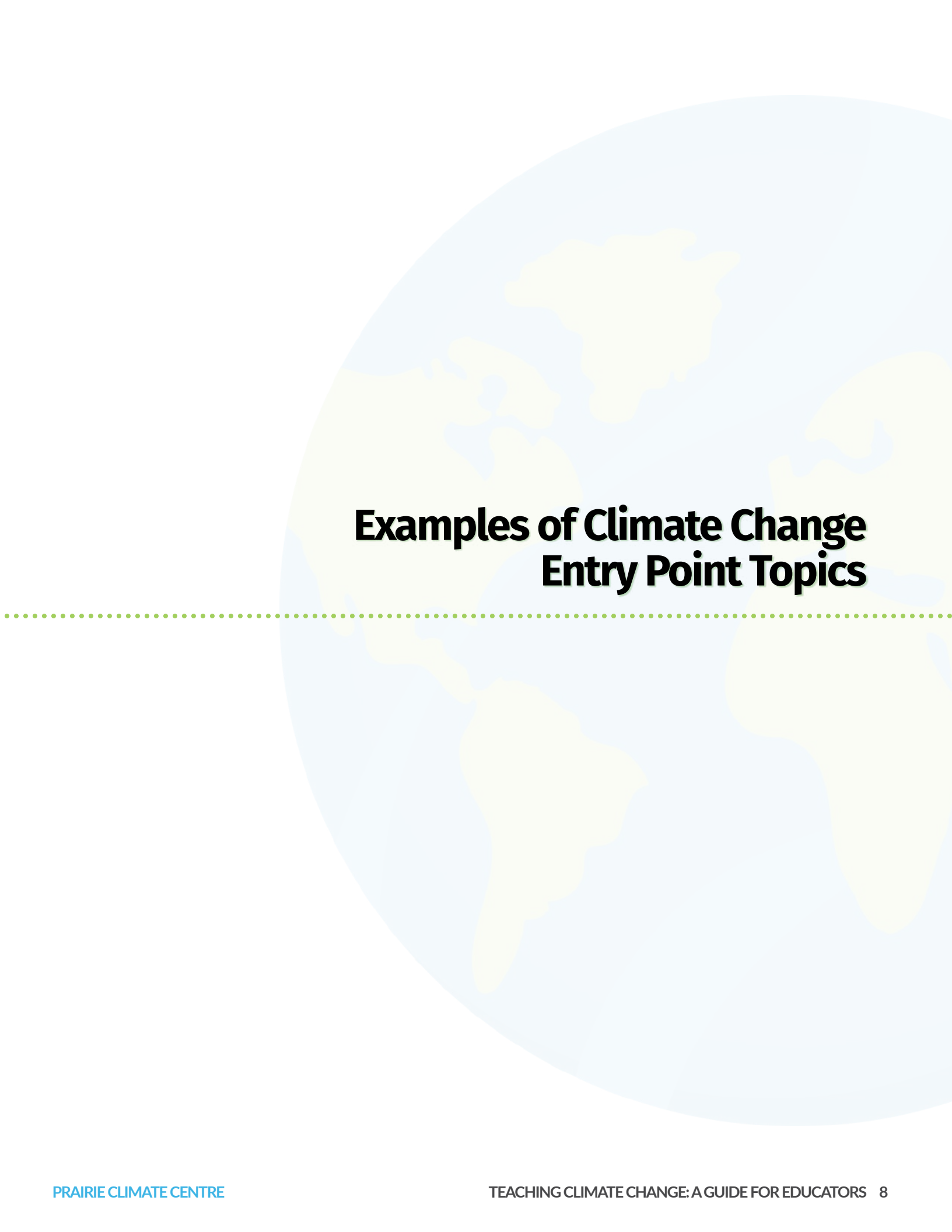
Educators can adapt these approaches to fit their specific provincial or territorial curriculum and assessment practices.

## A Flexible Approach to Climate Education

This guide is designed to be flexible and adaptable. It recognizes that:

- students enter learning at different points
- educators have varying levels of experience with climate topics
- classroom contexts differ across Canada

By offering multiple pathways into climate change education, this guide supports educators in creating inclusive learning environments where all students can participate and grow. Teaching climate change is an opportunity to build knowledge, as well as to cultivate critical thinking and a sense of agency. With the right supports and approaches, educators can help students engage with this complex issue in thoughtful and meaningful ways.



# **Examples of Climate Change Entry Point Topics**

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# Examples of Climate Change Entry Point Topics

## *Introductory Level*

### **Knowledge/Understanding**

Comprehension of a climate change subject, its meaning, and significance.

- Weather vs climate\*
- Global temperature increased (greenhouse effect)
- Defining sustainability

### **Thinking/Inquiry**

Using critical thinking skills and creativity for brainstorming ideas and making connections on climate change topics.

- Seeing climate in your own world
- Ways climate impacts your daily hobbies and activities\*

### **Communication**

Conveying meaning, expression, and perspectives of climate change in various formats such as oral, visual, and written.

- Introduction to talking about climate (family, friends, teachers)\*
- Making and sharing goals on living more sustainably

### **Application**

Ability to make connections within and between contexts such as personal, local, and global concerns.

- Immediate actions to live more sustainably
- Learning about working with community to make an impact\*

## *Intermediate Level*

- Climate impacts on extreme weather
- What are greenhouse gasses and the carbon cycle\*
- The benefit to minimizing your Eco Footprint

- Identifying climate change in your community
- Researching climate information\*
- Incorporating multiple perspectives into climate solutions

- How to write to policy makers about climate change!
- How to talk about climate change, things that are important to you\*

- Find and support local citizen science opportunities
- Adaptation vs mitigation as an individual
- Addressing eco anxiety\*

## *Advanced Level*

- Regional climate-related changes and risks\*
- Health impacts of a changing climate

- Mitigation efforts around the world
- Local socioeconomic impacts
- Disproportionate impacts of climate change\*

- Using climate graphs and data
- Using maps to quantify climate change\*

- Research and present about a (Youth) Climate Advocate
- Identifying misinformation around climate change
- Jobs that support adaptation, mitigation and climate justice\*

\*More information on these topics found in their associated level of learning

# Introductory Level

## Overview

In this stage, learners can gain a basic scientific understanding of climate change and how it might impact their daily lives. Through this process of identifying how climate change impacts their lives, students can develop an understanding about the significance of take action. Learning ways to take both individual and collective action are important at this level.

The following topics are examples of content areas to address at the beginner level. Educators should build out from these examples in response to learner readiness and interest.

## Weather vs climate

### *Knowledge*

Weather and climate are interconnected, but mean different things. Weather is what we see outside at any given moment, or in the immediate short-term forecast. Climate is the patterns observed over 30 year averages. With a changing climate, weather will be drastically impacted. Being able to understand this relationship will help learners grasp the basics of climate systems.

[Climate Change: The Basics \(The Climate Atlas of Canada\)](#)

[Climate vs. Weather \(The Climate Atlas of Canada\)](#)

## Climate impacts on personal activities

### *Critical Thinking*

Climate has an impact on a broad spectrum of activities, especially activities that take place outdoors. In response to climate change, sometimes outdoor activities need to be limited to protect participants from extreme weather such as heatwaves, storms, and wildfires. We can expect that timing of winter and summer sports will change as temperatures rise and change season lengths.

[My Hobby, Our Climate Student Worksheet \(Ducks Unlimited Canada\)](#)

## Talking about climate change

### Communication

Climate has an impact on a broad spectrum of activities, especially activities that take place outdoors. In response to climate change, sometimes outdoor activities need to be limited to protect participants from extreme weather such as heatwaves, storms, and wildfires. We can expect that timing of winter and summer sports will change as temperatures rise and change season lengths.

[How to talk to children about climate change](#) (Australian Psychological Society)  
A hands-on toolkit for parents and caregivers

## Working with community to make an impact

### Application

Working with local communities is one way that students can become part of a larger solution and offer us diverse ways of getting involved. There is strength in numbers, coming together with organizations can create more meaningful impact. Opportunities for working with community can include volunteering locally, participating in citizen science, and getting involved in community projects.

[How to create local climate change projects with your students](#) (PBS)  
Insights on creating meaningful learning experiences in the classroom.

## Additional Resources

### [Climate Change Activities](#) -TOYBOX

*For younger audiences, the Toybox group curated age-appropriate activities that focus on the topic of climate change. At this level, many activities focus on engaging youth with the environment around them while considering numeracy, literacy, and wellbeing.*

Video: Natural Disasters and Climate Change - <https://www.youtube.com/watch?v=RnwnLI3K5ss>

## Take Action Project Feature

[School Community Garden for Climate Change](#)

# Intermediate Level

## Overview

Intermediate learners can expect to be ready to learn about climate change on a more local level such as community impacts and opportunities for involvement. Skills in researching and identifying misinformation will be a translatable skill used in many life situations. With increasing awareness of impacts, especially in community, learning to manage emerging or existing eco-anxieties will be important.

The following topics are examples of content areas to address at the Intermediate level. Educators should build out from these examples in response to learner readiness and interest.

## What are greenhouse gasses and the carbon cycle

### *Knowledge*

Without greenhouse gasses, the earth would not be warm enough to be a livable place. However, with human-made greenhouse gasses being added into the atmosphere, the result is an increase in global temperature beyond what is ideal and it has many impacts. Understanding the carbon cycle can help us find solutions to reduce greenhouse gasses, like carbon, from the atmosphere.

[Greenhouse Gasses Learning Article](#) (The Climate Atlas of Canada)

[Why is carbon important?](#) Article (NASA Climate Kids)

## Researching climate information

### *Critical Thinking*

1 in 10 Canadians do not know how to fact check information, which can lead to increased instances of misinformation ([Statistics Canada, 2023](#)). Having the skills and ability to research reliable and credible information is a necessary tool to learn to be able to be confident in what we know true. Having high researching skills also increases confidence in our ability to talk about climate change, knowing that we have reliable source information.

[Lesson: How to fact-check and add context](#) (Media Helping Media) Educators can use this lesson to teach how to fact check climate change information/misinformation

## Talking about climate change

### Communication

At this level, we know a lot about what we can do as individuals to help reduce carbon emissions. Collective actions on a bigger scale can make even bigger ripple effects in the fight against climate change! Writing to policy makers is one way we can push for change on government levels and making them aware of what citizen concerns should be prioritized.

Build an e-Card: Use your voice, make a difference! (Green Learning)

## Addressing eco anxiety

### Application

Climate change is an increasing concern among individuals, especially young people. Being able to have the skills and resources available to cope with emerging eco-anxieties can be crucial in ensuring the care of our collective mental health. When climate change becomes overwhelming, it can prevent participation in solutions. By combatting eco and climate anxieties we are also promoting engagement and activism!

My Climate Story: A tool-kit for working through the meaning of climate change with courage and compassion - 8 lesson teachers guide (Little Green Thumb)

### Additional Resources

The Climate Atlas of Canada

High vs. Low Carbon scenarios

Why Climate Changes?

### Take Action Project Feature

Restoring Tallgrass Prairies in Winnipeg's Garden City Neighbourhood

# Advanced Level

## Overview

Learning at the advanced level incorporates many approaches that connect scientific, social, and economic perspectives, allowing for a more holistic and complex understanding of climate change. This approach goes beyond basic concepts by encouraging students to analyze and synthesize information from various fields, fostering critical thinking and a deeper comprehension of the interconnected nature climate change has on global systems.

The following topics serve as foundational content for advanced learners. Educators should expand upon these based on learners' readiness and interests, fostering a dynamic and engaging learning experience.

## Regional climate risks

### Knowledge

Climate change is impacting everyone across Canada, from severe wildfires to melting permafrost to coastal erosion. How we see climate change on a local level is very different than someone in another region of Canada. By understanding the range of impacts nation-wide we can gain a better understanding of the significant climate change has on all people living in Canada.

**FireSmart BC Education Program** Lesson Plans  
**Forest Fires and Climate Change** (Climate Atlas of Canada).

## Disproportionate impacts of climate change

### Critical Thinking

Not only does climate change impact regional populations differently, but the impacts from one person to the next are not the same either. Disadvantaged populations experience climate change significantly worse due to social or economic barriers. Being able to identify these disproportional impacts, especially in our communities, can empower us to help and minimize climate impacts on these populations.

Video: [Crippling Climate Adaptation](#)

[Teachers Guide](#) (TCI Learning Lab)

- 6 Lessons on Climate Justice and Equity



## Using maps to understand climate impacts

### Communication

Maps are a common way to visualize climate change across geographic regions. By having the skills to read and understand maps, it is an advantage in comprehending visual communication tools and being able to translate the knowledge from awareness into action. Understanding reliable climate information also empowers individuals to speak confidently on issues around climate change.

Explore the [Climate Atlas of Canada Map](#) (Climate Atlas of Canada)

## Jobs in climate change

### Application

Careers in climate change may seem hard to come by, but they are everywhere. Climate change is an interdisciplinary topic that intersects with every job available. Whether you work in cities or rural municipalities, business or research, independent or with a company, climate change is relevant in any case. Knowing what to look for, and what skills and knowledge you want to bring into a dream job can make any position a part of the solution to climate change.

[How to create local climate change projects with your students](#) (PBS)  
Insights on creating meaningful learning experiences in the classroom.

### Additional Resources

#### ***The Climate Atlas of Canada***

The advanced learning level can start to integrate interdisciplinary layers of climate change including social, economic, and environment.

- [Canadian Cities and Climate Change](#)
- [Indigenous Knowledges and Climate Change](#)

#### ***Learning for a Sustainable Future - Green Jobs: Adapting to Our Changing Climate -***

<https://lsf-lst.ca/resources/green-jobs/>

### Take Action Project Feature

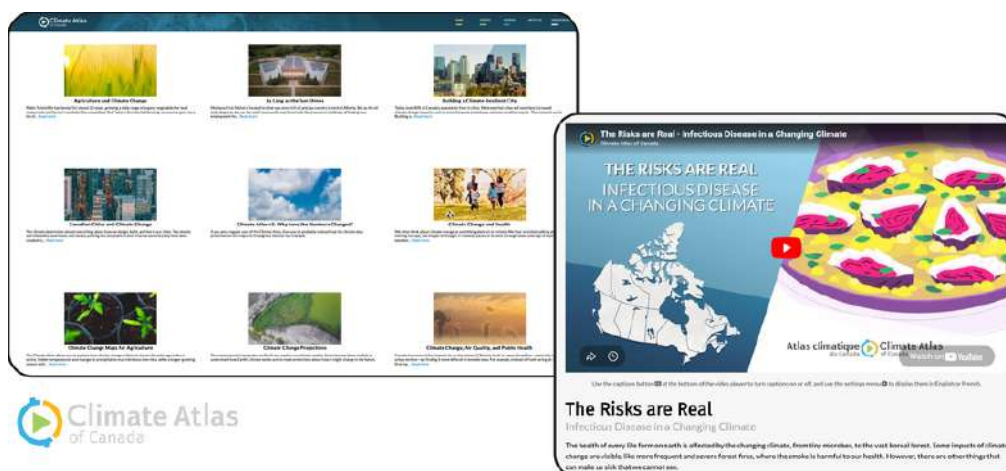
[HOME Pails - A Division of Food for Thought: Sustainable Urban Farming Project](#)

# Resources for Teachers

This page is for educators looking to deepen their own understanding of climate change and access to reliable, high-quality information. The resources in this section are a higher level of climate change content that supports the development of climate literacy for anyone, including educators seeking to expand their knowledge.

## Articles on the Climate Atlas of Canada

Articles cover a wide range of topic, including basic climate change information, Indigenous Knowledges, forestry human health, renewable energy, and many more.



## Climate Change Connection

### Essential Background for Climate Change Education

This report is designed to provide a starting off point for teachers, with all the background information they need to launch climate change education in their classrooms. It includes resources to eliminate barriers and fears about approaching this subject, how to establish best practices, and how to get more teachers interested in the subject.

## ***Climate Justice Education for K-8 Educators: E-Course for Canadian Educators***

This online course will offer inspiring learning led by teachers and Climate Change Education (CCE) experts to plan pathways into CCE for Grades K-8 students. It aims to grow teachers' knowledge and practice of CCE by learning collaboratively with other educators on topics such as socio-emotional learning, Indigenous ways of knowing, climate justice, hope, and age-appropriate climate action.

Link: <https://accelerating-cce.ca/10-2/cce-e-course/>

## ***Yale Program on Climate Change Communications***

### **Climate Change Basics: 5 Facts, 10 Words.**

This is an Introductory article to climate change for educators who want a better understanding on climate change before using the teaching resources.

Link: <https://climatecommunication.yale.edu/for-educators/climate-change-basics-five-facts-ten-words/>

### **Teaching Resources (Grades 6 - 12)**

These classroom resources for teaching about climate change can be filtered based on introductory, intermediate, and advanced levels.

Link: <https://climatecommunication.yale.edu/for-educators/>

