

REPORT

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ESSENTIAL BACKGROUND FOR TEACHING CLIMATE CHANGE



PREPARED BY

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CLIMATE CHANGE CONNECTION

ABOUT CLIMATE CHANGE CONNECTION



ABOUT

A charitable non-government organization working to educate Manitobans about climate change and facilitate climate change solutions.

OUR WORK WITH TEACHERS

Climate Change Connection has been assisting teachers from across Manitoba for over 17 years. Teachers rely on Climate Change Connection for up-to-date information, classroom resources, Manitoba specific lesson plans, presentations, province-wide events, in-school conferences, connections to experts in the community, assistance with school action projects, and to provide professional development opportunities. We value the relationships and information sharing we have with teachers.



CLIMATE CHANGE
CONNECTION

Climate Change is a wonderfully complex subject that includes Science, Mathematics, Language Arts, and Social Studies. Its interdisciplinary expanse provides a unique opportunity for educators to discuss our environment, economy, and communities in a variety of ways with their students. However, due to its complexity, it is difficult to know how to **educate**, **motivate**, and **activate** your students if you are not an expert.

It is important that a topic like climate change is engaging and ignites students but if not taught correctly students can become overwhelmed and anxious. It can also be so complicated that students will shut down and not engage. Teachers need the tools and resources at hand so that when they start discussing climate change, they know how to do it in a way that is not overwhelming, and how they can support or inspire action in their students.

This report seeks to answer the question
“What are the best practices for Manitoba teachers to teach climate change?”

To write this report we used the following methodology:

- Applied our 15 years of climate change education experience working with teachers and researching best practices.
- Consulted peer-reviewed and academic articles - Reviewed recently published articles and literature reviews. Our works cited and other key articles are listed in Appendix 1.
- Consulted non-academic publications from other provinces, NGO's, and governments to incorporate a wider political and practical perspective from a large pool of expertise.



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.

We are hoping the background knowledge provided will focus the message teachers need to provide and inspire more classroom conversations, projects, and, ultimately, action.

In this report, you will find:

1. Age-appropriate climate change education
2. Classroom Language
3. Addressing the Controversy (Hint: There is no Controversy)
4. Complexity Can be your Ally
5. How to Avoid Doom and Gloom Messaging
6. Focus on Action
7. Building Skills to Act
8. Best Practices to Engage Students

AGE-APPROPRIATE CLIMATE CHANGE EDUCATION

Climate change is a topic that can be incorporated into all classrooms. It will be drastically different in an early years' classroom than a senior years' classroom, but the overall goal to develop a sense of understanding, responsibility, and passion for the world around us is the same. It is critical for each Manitoba classroom to practice environmental stewardship.

KEY MESSAGE:

Climate Change is real. It is due to humans. We need to take action now.

Here are some best practices:

For early years, the mechanics of climate change are too complex. The goal is to start small. Rather than hitting them up with the greenhouse effect and melting ice caps, start with the importance of trees, keeping our air and water clean, and taking care of our Earth. Children at this age are old enough to start exploring cause and effect: the ways nature affects us and the idea that humans can impact nature. This is the age we need to foster a love for nature and develop positive environmental stewardship behaviours. Without even discussing climate change, we are establishing behaviours that will protect our environment.



For middle years, Grade five is a great opportunity to introduce the basics of climate change. At this age, children are generally ready for honest conversations about the impacts humans have on our planet. Specific classrooms will be able to advance the conversation further and some may just use broad strokes. The Manitoba curriculum introduces topics like weather and citizenship that are great transition points to climate change.

You can use guiding questions like: What would it be like in Winnipeg if it was really hot all summer and we didn't get any rain?, What would it be like if it rained for all of September and October?, and Can you think of ways we can eliminate all the stuff that goes in our garbage? You can also frame climate change discussion with topics students this age connect with, like animals, sports, and family. We need to build on the positive environmental behaviours they have practiced in early years and develop a strong connection to nature. The childhood nature experiences they have in the middle years will strengthen the link to positive environmental behaviour in the future.

For senior years, it is important to teach the science but focus on solutions (more on this later in the report). Students need to feel empowered and it is best to allow the students to direct the learning. Group projects that focus on action and solutions are very beneficial to learning for this age-group, as they encourage self-directed learning, motivated topic area research, and results-based project work. High school students need real-world connections to properly immerse themselves in learning.

For every lesson that focuses on a problem or challenge, consider adding a positive and actionable point.



In all classrooms, we need to create a **foundation of sustainable actions** and make sure we take time to get the students out of the classroom to learn. Students can get involved in local community action or they can connect to the outdoors and the gifts that learning outside can offer them.

AGE- APPROPRIATE ACTION

David Sobel, from Antioch University New England, created a “Ladder of environmental responsibility.” The ladder provides a great outline of age-appropriate actions for K-6 students.[1]

LADDER OF ENVIRONMENTAL RESPONSIBILITY A Model for Elementary Schools	
K:	Seasonal School Beautification: Teachers and students responsible for weekly displays of flowers, rock gardens, winter twigs, and the natural displays that fit with seasonal celebrations of the solstices and equinoxes.
1st:	Flower Garden Maintenance: Teachers and students weed the gardens, put them to bed for the winter, start seedlings in the late winter, run the plant sale in early spring, bring the garden to life, install new plantings.
2nd:	Schoolyard Vegetable Gardens: Teachers and students install raised beds, test and amend the soil, harvest vegetables, arrange for the harvest festival, put the garden to bed, put up the pickles, order the seeds in the spring, plant the garden, organize the volunteers for summer maintenance.
3rd:	Maintaining the Schoolyard: Teachers and students keep the nature area or schoolyard clean, devise graffiti and vandalism prevention programs, help to teach schoolyard games, work with school maintenance staff, create homes for wildlife, keep the bird feeders full, keep the running record of birds that visit the feeders.
4th:	Running the Recycling Program: Teachers and students design and run the paper-recycling program. They collect the paper and bring it to the collection site, and they monitor classroom and school use in hopes of decreasing paper usage. Systems for other materials such as glass, aluminum cans, and inkjet printer cartridges are developed as the system matures.
5th:	Tending the Composting Program: Teachers and students work with school lunch staff to first design a pre-consumer composting program and eventually a post-consumer program. Fifth graders educate new students about what’s compostable and what isn’t. They also staff the post-lunch separation process. When the system matures, post-snack systems are developed as well.
6th:	Climate Change Team: Teachers and students are responsible for minimizing the carbon dioxide output of the school. They accomplish this with yearly projects to monitor and reduce electricity, heating fuels, and water consumption in the school. Students suggest changes in student/teacher/staff behavior to reduce consumption. Students and teachers work with building maintenance staff to use the healthiest cleaning products with the least emissions.

DAVID SOBEL

Professor David Sobel developed the Ladder of Environmental Responsibility as a guide for when and how to discuss climate change with children.

CLASSROOM LANGUAGE

When educating students, we need to use accurate and appropriate language. Over the last 15 years, we have changed the terms from “**global warming**” to “**climate change**” and now to “**climate crisis**” or “**climate emergency**.” There will be more variations to come, but the reality is they all mean the same thing. They have only changed the language to attempt to change the narrative or increase the urgency. The messaging and urgency shift with time and the language reflects these shifts - the science behind the language remains the same.

Regardless, we don't need to use any of those words when talking to early years classrooms. **It is too complex.** We need to keep it simple. A common way to talk to younger students is to talk about **keeping the Earth healthy** or protecting it. Younger students will understand getting sick and understand how superheroes protect others. We always want to use positive language that encourages action and positive behaviour.

In middle years classrooms, we can use the words “climate change” and “global warming”, but it would help students to also use simpler language like larger storms, harms animals, no water, and strengthen communities. This is also the age students jump to extremes and talk about polar bears dying and air pollution killing us. It is important to correct the students and tell them we are hopeful that humans will change their behaviours in time and there isn't consensus that polar bears are dying due to climate change just that they are being harmed.



By grade nine, students should be presented with the current words used in the news, such as “climate crisis” and “climate emergency.” They should be given the full picture of the circumstances of climate change.

It is important to **not overuse crisis language** or scare students. This might mean changing the words used or not emphasizing the catastrophe component of the topic. We also don't want to blame anyone for the current crisis. As Manitobans, we are all part of the problem. That also means we can be part of the solution. For instance, industries may get blamed for emitting greenhouse gases but it is us consumers that buy their product. We also can't point our fingers at any other country or province. This may alienate students in the classroom. **As Manitobans, we contribute more greenhouse gas emissions than most citizens around the world.** It is our contribution to this problem that we have to solve. This is a global crisis and we all need to do our part.

Discussions about solution and pollution provide a great opportunity for students to share their experiences living in other countries.



ADDRESSING CONTROVERSY

Manitoba classrooms should not be “teaching the controversy.” It is ineffective to hold debates. It makes sense to debate issues that have opposing viewpoints. But you wouldn't hold a debate on whether high amounts of sugar are good for you, because doctors have agreed on the answer. The same is true for climate change. Encouraging debate assumes the issue of the cause of climate change is up for debate, when it is not.[2]

Multiple studies published in peer-reviewed scientific journals show that 97% or more of actively publishing climate scientists agree: Climate-warming trends over the past century are extremely likely due to human activities.

COMPLEXITY CAN BE YOUR ALLY

Don't get caught up in the complexity of the topic. It is okay, as educators, to not know everything. You can even use it as a jumping-off point with your students - tell them you are going to learn together. Make sure your own knowledge of the subject doesn't stop the students from learning this important topic. Teachers should not feel paralyzed by uncertainty. We want to allow students to **inquire, research, and explore** new information. Stepping into the unknown with your students by approaching a complex, unfamiliar topic is a wonderful opportunity to get innovative, creative, and collaborate with your class. Climate change allows teachers to cross-curriculum teach, activate students in school-wide and community projects, and use inquiry.

Use the vast amount of **community resources** to help you teach. Manitoba has many experts that will come to your classroom. It is great for students to hear the message from someone working in the community. There are also many resources online that can help you navigate lesson plans and activities to engage your students.



HOW TO AVOID DOOM AND GLOOM MESSAGING

Sometimes, researching climate change and the urgency of the problem can result in slipping into a “**climageddon**” style of communication where apocalypse and fear are the dominant message passed along to the students in the classroom. While this may motivate some students, it can have a numbing on many of them. This can lead to anxiety in some and others to shut off what they are hearing as a means of coping. There is a way to provide an honest view of the issue without suggesting that the world is coming to an end. By presenting solutions in tandem with impacts, teachers can decrease the chance of students becoming anxious, decreasing the likelihood students shut down due to overwhelm. This will increase student’s engagement in the topic and desire to take action.

It is important to note, there should be no doom and gloom messages before Grade five.

A Swiss National Science Foundation study conducted with adults (Finger, 1993) found that too much knowledge about environmental tragedies actually discourages environmental behaviour.[3]



FOCUS ON ACTION

It is important to emphasize the **urgency of climate change** but we need to make sure students don't feel powerless. It was stated by Gordon Lambert that the topic of climate change contains **two spaces – the problem space, and the solution space.**[4] We need to focus on the solution space as much as possible. This means focusing on concrete actions that students can take. Climate Change education has been shown to be more effective if the focus is on individual empowerment and positive local action being taken to promote a sense of hope in students.

Hope is essential for action.

TEACH ABOUT CHANGE

UNESCO Chairs, McKeow and Hopkins, define climate change education by looking at the two words: **Climate** focuses on the science behind climate change and address the weather and climate systems and could also include the impacts on the natural systems. **Change** is where they suggest it gets interesting as it incorporates the social and humanities aspect of education. They suggest we just consider teaching **ABOUT** change and **FOR** change and propose 6 steps to do this: issues analysis, community and personal decision making, political processes, social justice, inter-cultural sensitivity and competence and behaviour change.[5]



The lessons we learn at school will be duplicated at home. Research confirms that students who practice environmental stewardship in their classrooms, also practice it at home and in some instances are the driving force initiating environmental practices with their caregivers. As teachers, we need to practice what we preach and be a **model for environmental stewardship**. But remember no one is perfect, and if we start with small actions we can build to larger actions. Ways you can model good behaviour are by bringing a reusable water bottle and mug, eliminating packaging in your lunch and snacks, buying second hand, and ultimately getting to work sustainably (walk, bike, bus, carpool, fuel efficient car). Some ideas for your classroom: you can recycle, compost, conserve energy and water, reduce paper use, reuse school supplies, take your students outside, and thread environmental conversations through all subjects.

It is important that classrooms provide the opportunity to **take action** in the community and allow students to engage in citizenship action that can have a greater reduction on greenhouse gases. This could include allowing students to attend rallies, support local action groups, and promote greener lifestyles.

A great way to inspire action is to tell your students about local actions that are taking place or have taken place in your school and community. These examples can inspire action and plant seeds of hope.

Dr. David Sobel said "If we want children to flourish, we need to give them time to connect with nature and love the Earth before we ask them to save it."



AGE-APPROPRIATE ACTION

Early years:

- Waste management (recycling, composting, reducing waste like paper)
- Green your school grounds (outdoor classroom, gardening – butterfly, vegetable, flower, rain)
- Planting trees
- Litterless lunches
- Playground maintenance and clean ups

Middle years:

- Waste reduction (audit, recycling, composting, reduce, e-waste collection)
- Establish an environmental group
- School environmental education (assemblies, posters, signs, presentations, skits, competition, fundraisers)
- Transportation initiatives (eliminating idling, organizing walking school buses, encouraging busing and biking)
- Gardening and school ground enhancements (tree planting, nature playgrounds, and butterfly gardens)
- Energy efficiency (audit, education, energy policies)
- Water conservation (audit, install water saving devices, rain barrels)
- Tackle food issues (cafeteria solutions, bottled water, vending machines, personal lunches, water fountains, fair trade)
- Advocacy (letter writing, attend protests, fundraising)

Senior Years:

- Consumerism (Clothes Swaps, fair trade, Buy Nothing Day, repair)
- Educational events (in-school or community)
- Establishing green policies for the classroom and/or school
- Waste reduction (audit, recycling, composting, reducing waste, e-waste collection, school supply collections)
- Establish an environmental group
- School environmental education (assemblies, posters, signs, presentations, skits, competition, fundraisers)
- Transportation initiatives (eliminating idling, organizing walking school buses, encouraging busing and biking)
- Gardening and school ground enhancements (tree planting, nature playgrounds, and butterfly gardens)
- Energy efficiency (audit, education, energy policies)
- Water conservation (audit, install water saving devices, rain barrels)
- Tackle food issues (cafeteria solutions, bottled water, vending machines, personal lunches, water fountains)
- Advocacy (letter writing, attend protests, fundraising)

BUILDING SKILLS TO ACT

Teachers have the opportunity to provide students with skills that can help fight climate change. These can be **skills to lighten their carbon footprint** (bike maintenance and safety, active transportation, cooking and sewing, composting, gardening, repair). They also have the opportunity to provide them with **skills to identify and solve problems**. These could be project management, communication, team work, leadership, fundraising, and advocacy. School projects should give students a chance to practice and master these skills. This can also empower students to influence change as members of activities in their community and as they enter the workforce.



CHALLENGE STUDENTS

Teachers who want to follow **best practice** guidelines and challenge students to take **serious actions** that will result in the largest emission reductions in Manitoba should focus on these four high-impact actions:

- Living **fossil fuel free**
- **Eating** a plant-based diet (or reducing meat consumption to only locally sourced)
- Eliminating **plastics**
- Reduce **consumption** to just essentials

BEST PRACTICES TO ENGAGE STUDENTS

Sadly, knowing the facts and understanding the reality of climate change is not enough and it will not inspire action. There is a disconnect. For decades, Scientists taught citizens about climate change and have seen very little behavioural change. As a result, we are now in an urgent situation. This means we have to change our tactics from providing information to **providing students with the tools and opportunities to take action.**

As educators, we can't assume what motivates us will motivate others. We need to vary our approach to teaching climate change so we engage the most students in our classroom. Although this may be time consuming, we may need to **change the frame** we use to teach climate change each year. We need to do more to see real engagement and action.

More ideas on how we can engage students:

- Keep it **local** and Manitoba specific - Make it **personal**. How climate change affects students – emissions, impacts, and solutions
- Focus on **positive outcomes** and a community, city, province they want to see
- Encourage critical thinking and creativity
- Stick to the facts and **consensus science**
- Allow students to guide their learning within the topic and design projects to address their concerns and interests
- Connect to **local experts** and the community to make learning authentic and meaningful

UNESCO is trying to emphasize the importance of social-emotional and behavioral learning. In a survey on climate change education, UNESCO found that most countries still focus on cognitive knowledge – which is important of course, but we need to **touch people's head, heart, and hands** to help them understand the causes and impacts of global warming today. This means teachers need to tap into the power of social, emotional, and behavioral learning. We need to harness all aspects of learning to make the required change happen. Our approach to schools and education also needs to drastically change. UNESCO is promoting a **“whole school approach”** to climate change education and learning. It essentially seeks to incorporate sustainability into all aspects of a school, and to involve the community, to create a learning environment where students and educators breathe and live sustainability.[6]

A NOTE ABOUT CLIMATE CHANGE IN MANITOBA

Ideally, Students graduating from Manitoba high schools will have been given the knowledge, skills, and motivation to act sustainably. They should also walk away knowing these five key messages:

- Climate Change is real
- It is Bad
- It is due to humans
- Experts all agree
- We have the tools to fix it

Upon review, Manitoba's curricula reflect three of the above five basic climate change messages.

A survey done by Learning for Sustainable Futures and Lakehead University (2020) states, "between 35% and 59% of teachers reported teaching climate change in the classroom. Of those that teach climate change, most teach 1-10 hours per year or semester." [7] Manitoba's climate change curriculum was published in 2001, making it the oldest in Canada. [8]



CONCLUSION

It is important Manitoba classrooms make climate change education a priority. As a province, we need to devote more of our classroom time to climate change education. We can use its complexity and urgency to educate, motivate, and activate students. To do this, we need to support teachers and provide them with the training and resources to do this well. It is not enough for teachers to just present climate change information. Teachers need the tools and resources at hand so that when they start discussing climate change, they know how to do it in a way that is engaging and not overwhelming. Teachers have the opportunity to challenge students, develop critical skills, and inspire action. We can't wait any longer to take action and Manitoba classrooms are a great place to foster and ignite the environmental stewardship required.

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APPENDIX 1

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