

CLIMATE CHANGE, CHILDREN AND YOUTH

**Local Connections
to Global Issues**

Teacher Resource Guide
Grades 9 to 12

unicef 
canada



COVER PHOTOS

© UNICEF/PAKA2010-00472/Ramoned

Pakistan, 2010

A woman holds on to a boy and carries a baby as they cross a flooded road in Baseera, in the flood-affected province of Punjab.

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Niger, 2012

Tsahara Saidou holds her two-year-old son, Moctar, who is suffering from severe acute malnutrition, as they return to their home village of Garin Kouroun, Maradi Region. They have just visited the UNICEF-supported health centre in the village of Sarkin Yamma Saboua, approximately six kilometres from Garin Kouroun, in Madarounfa Department.

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Mongolia, 2012

A girl fetches water from a frozen stream in the 'soum' (district) of Renchinlumbe, in the northern Khövsgöl 'Aimag' (province).

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Zimbabwe, 2011

Children watering bean plants in a nutrition garden at Shirichena Primary School, Mhondoro district about 60km south of Harare. The school is supported by UNICEF through the Child Friendly Schools Initiative.

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ACKNOWLEDGEMENTS

This guide was developed and revised in collaboration with teachers across Canada, UNICEF Canada, Skye Consulting, Eco-Integration, and GreenLearning Canada. The UNICEF UK's Climate Change Report 2008: *Our climate, Our children, Our Responsibility* provided the inspiration for this guide. The 2013 revision has been inspired and influenced by the UNICEF guide: Education Kit on Climate Change and Child Rights (2011).

UNICEF Canada would like to give particular thanks to Fiona Zawadzki and Diana Klein (<http://www.greenbricks.ca>), for their development of this resource. They work with British Columbia youth and teachers, exploring sustainable land use and development through curriculum-linked outreach programs.

UNICEF Canada would like to sincerely thank the many teachers and interns who took the time to review this resource and provide us with comments that have informed our writing and revisions. They have provided invaluable comments, suggestions, links to amazing resources and videos online, and in many cases created new activities for this guide. We appreciate their knowledge and commitment to exploring these issues with their students.

Teacher review committee, first edition

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- Jessica Loughridge, University of Toronto/OISE;

A special thanks goes to Gordon Harrison and Stephen MacKinnon at GreenLearning Canada, for providing the amazing online platform on which the latest version of this resource was piloted and reviewed: COOL 2.0 (<http://cool.greenlearning.ca/>). GreenLearning Canada is a non-profit organization with the mission to create educational resources and experiences that empower young Canadians to effect environmental and social change. This resource is available on the GreenLearning site/COOL 2.0 and also on the UNICEF site at globalclassroom.unicef.ca

INTRODUCTION

Thank you for inviting UNICEF Canada into your classroom. This guide has been created to support secondary school educators in their efforts to work with youth to take action on climate change. Through the thought-provoking activities contained here, students will have the opportunity to nurture their compassion and discover how climate change is affecting children around the world, especially children in developing countries. We aim to provide you with tools that will support your students in their efforts to affect meaningful and lasting change, and inspire them to take action at a local level.

Educators can provide youth with the knowledge of the issues facing their future, the tools to explore solutions, and a sense of awareness that they have the capacity to make a difference. The goal of this guide is to inspire both teachers and students to connect local issues to global concerns and develop the attitudes needed to change our world for the better. It is essential that children and young people have a voice, and are given the opportunity and environment in which they can work to effect change.

Here's what educators are saying about this guide:

"This guide will help teachers reach the goal of making our students educated, global citizens."
(Jennifer Mahon)

"This guide is a key resource for any social action-oriented educator." (Bogna Haddad)

"It is evident that the preparation of this resource was extensive. The links, specifically multimedia, are superb." (David Weightman)

"Included are great project ideas that students can personalize for their own needs and community." (Demetra Kotsalis)

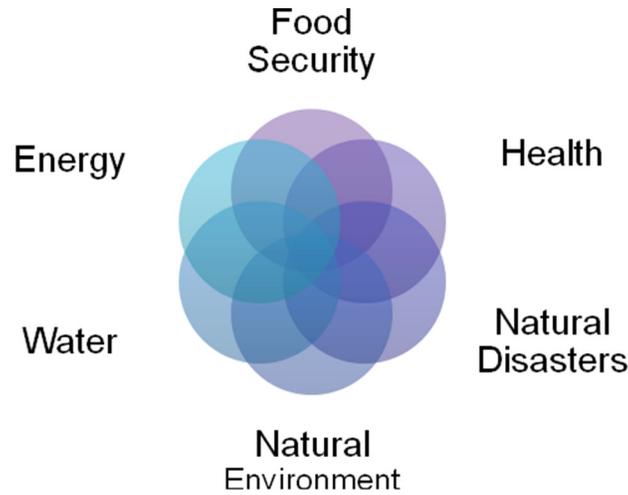
This second edition of the guide contains interactive activities and support documents, and updated lessons and approaches to youth engagement. However, we have chosen to keep most of the activities, which include facts and references to proven and respected resources from the first edition. Feel free to research new sites and find new resources online to supplement and adapt these activities. The Internet is always changing, so feel free to view these lessons as a framework, and you and your students can then be plugging in the updated statistics and new websites.

The guide is framed around the six interconnected themes as presented in the UNICEF UK's Climate Change Report 2008: *Our climate, our children, our responsibility*. This report details how the issues threatening the survival of children in developing countries link with the impacts of climate change. There are of course many new and relevant reports and resources that have been produced since then, and we have made efforts to reference some of our favourites in this teacher resource. We have also adapted some of the activities from the UNICEF Education Kit on Climate Change and Child Rights, which is available in its entirety on globalclassroom.ca

"Over the past decade, changes in the Earth's environment and its natural systems have emerged as a matter of increasingly urgent concern around the world. While the issues are complex and diverse, there is a shared and universal recognition that solutions will arise only through committed action on a global, national, regional, local, and individual scale. Schools have a vital role to play in preparing our young people to take their place as informed, engaged, and empowered citizens who will be pivotal in shaping the future of our communities, our province, our country, and our global environment."

– Ontario Ministry of Education

The themes in this resource can stand alone, or be delivered in combination. Also provided is an introductory activity (page 19) to connect all the themes. The themes are identified as:



This guide is designed for Grade 9 to 12 educators across Canada in order to fulfill curriculum expectations (including the revised 2008 Ontario curriculum) in the following subjects:

Province	Curriculum Connections
Alberta	Science 9; Science 10, 20, 14, 24, 30; Biology 20; Social Studies 20; and Environmental and Outdoor Education Junior High
British Columbia	Science 9 and 10; Sustainable Resources 11 and 12; Civics 11 ; Geography 12 (for additional courses, see Appendix G)
Saskatchewan	History 11 ; World Issues 11 ; Biology 11 ; Physics 12
Manitoba	World Geography 12; Biology 12; Science 10; World Issues 10; World Geography 12; Global Issues 12
Ontario	Science 9 Academic & Applied; Science 10 Applied; Biology 11 ; Chemistry 11 ; and Environmental Science 11, HIF10 & HIF20; HPW3C Grade 11; HIR3C Grade 11; HF4AM Grade 12; ADA20 Grade 10; ASM2O Grade 10; ADA3M Grade 11; BBI1O/BBI2O Grades 10 & 11; BDP3O Grade 11; BDV4C Grade 12; CGF3M Grade 11 (list is not exhaustive, please refer to Appendix H)
Quebec	Social Sciences: Geography, History and Citizenship Education, and Contemporary Economic Environment; Secondary English Language Arts
Atlantic Canada	Atlantic Canada in the Global Community 9, Science 9, Science 10, Biology 11, Physics 11, Global Geography 12, Global History 12

This guide was initially created to support Ontario and British Columbia curriculum connections, but we have added connections across Canada, which can be found in Appendix I.

The Governments of the Yukon, Nunavut, the Northwest Territories, Saskatchewan, Alberta, British Columbia, and Manitoba are all members of the Western and Northern Canadian Protocol (WNCP). This protocol supports the development of common curriculum frameworks for Western and Northern Canada. These frameworks allow for the adaptation and implementation of the provincial curricula in the northern territories. In accordance with WNCP the Northwest Territories follows Alberta standards, the Yukon follows the programming of British Columbia, and Nunavut adopts curriculum and resources from various jurisdictions. For more information visit: <https://www.wncp.ca/english/wncphome.aspx>.

UNICEF CANADA'S GLOBAL CLASSROOM PROGRAM

UNICEF Canada's mission is to mobilize and empower Canadians to invest in the positive transformation of every child's future. UNICEF Canada's Global Classroom program is a partnership with Canadian teachers and their students to inspire, educate and promote action on social justice, humanitarian issues and human rights - especially the rights of all children. This acclaimed program provides educators with classroom-ready resources and engagement tools, including:

- Bilingual elementary and secondary resources
- The Rights Respecting Schools initiative, which brings together our partners across Canada, the Friends of Rights Respecting Schools, with educators, parents and students, to discover the transformative nature of this engaging and hands-on program grounded in children's rights,

You can learn how UNICEF is supporting youth around the world as they continue to advocate for action on climate change on our Voices of Youth site at <http://voicesofyouth.org/>

Designed to foster global citizenship and understanding, these approaches demonstrate how each of us can create a better world for all children and the communities in which they live.

Impetus for the creation of this guide

The Global Classroom team at UNICEF Canada was inspired to create this guide to support Canadian teachers during the lead up to UNICEF's involvement at the United Nations Climate Change Conference, which took place in Copenhagen, Denmark in December 2009. This conference, also known as COP15, brought together close to 20,000 delegates from around the world for a historic high-level meeting on climate change. On this occasion, the City of Copenhagen and UNICEF organized a Children's Climate Forum to give children from both developing and industrialized countries a voice in this debate, and a chance to influence the important discussions at COP15.

The young people attending met with other young activists from around the world, and were offered an incredible opportunity to connect with and influence the world leaders who continue to make historic decisions regarding the future of our world.

The lessons learned at the Children's Climate Forum will help today's children adapt and respond to rapidly changing environments — and contribute to meaningful and sustainable change. Together, we can support young people in addressing these challenges.

UNITED NATIONS CONVENTION ON THE RIGHTS OF THE CHILD (UNCRC)

UNICEF was created by the UN General Assembly on December 1, 1946 as a temporary organization called the United Nations International Children's Emergency Fund, to respond to the suffering of children in European countries devastated by World War II.

In 1953, UNICEF was made a permanent arm of the UN to address the light of children in Asia, Africa, the Middle East and Latin America. Its name was changed to the United Nations Children's Fund although the acronym (UNICEF) did not change.

UNICEF is funded entirely by voluntary contributions from individuals, businesses, foundations, schools, associations and governments. The world's largest provider of vaccines for developing countries, UNICEF supports child health and nutrition, safe water and sanitation, quality basic education and the protection of children from violence, exploitation and HIV and AIDS.

UNICEF's work with children around the world is not just a moral assertion, it is codified in the UN Convention on the Rights of the Child (UNCRC)—the world's most widely ratified human rights treaty, adopted by 193 countries, including Canada. The CRC states that children have the absolute right to live in a decent environment with all that implies: living and growing in safety, enjoying good health and attending school.

There are 54 articles that comprise the UNCRC, all interrelated. What follows are the key articles relating to climate change, as outlined in the UNICEF UK Climate Change Report 2008:

Article 6: Children have the right to live. Governments should ensure that children survive and develop healthily.

Article 12: When adults are making decisions that affect children, children have the right to say what they think should happen and have their opinions taken into account.

Article 22: Children have the right to special protection and help if they are refugees (if they have been forced to leave their home and live in another country).

Article 24: Children have the right to good quality health care—the best health care possible—to safe drinking water, nutritious food, a clean and safe environment, and information to help them stay healthy. Rich countries should help poorer countries achieve this.

Article 28: All children have the right to a primary education, which should be free. Wealthy countries should help poorer countries achieve this right.

Article 38: Governments must do everything they can to protect and care for children affected by war.¹

For details on all 54 articles, refer to Appendix B: The UN Convention on the Rights of the Child in Child-Friendly Language.

WHY IS UNICEF TACKLING CLIMATE CHANGE?

UNICEF is mandated by the United Nations General Assembly to advocate for the protection of children's rights, to help meet their basic needs and to expand their opportunities to reach their full potential, and so it has joined the fight to protect our children from the impacts of climate change.

Children in developing countries will be the hardest hit by climate change. Because climate change reduces the availability of food in developing countries, children will not have the food they need to sustain their growth and maintain a healthy disposition. Already children in developing countries suffer from poverty, poor water and sanitation, lack of water and poor health. The effects of climate change exacerbate these issues. In addition, developing countries do not have the resources to quickly and safely adapt to the effects of climate change alterations in weather patterns, droughts, floods and the increase in the number and severity of natural disasters.

To further explore the science of climate change in your classroom, UNICEF Canada has posted online resources and lesson plans at <http://globalclassroom.unicef.ca/>

However, children are also a strong voice in the fight against climate change. According to a UNICEF Innocent Research Centre report called *Climate Change and Children: A Human Security Challenge*, children are among the greatest victims of climate change. But they can also act as vehicles for change, as children from developed nations can work with the adults in their lives to bring about meaningful and sustainable change. Therefore, we need to educate today's youth to be "proactive and prepared citizens empowered to adapt and respond to rapidly changing environments. An education, which will prompt young citizens to question and modify existing conditions and structures moving toward enhanced development objectives and disaster risk reduction and preparedness activities."²

Visit UNICEF's Press Centre at <http://www.unicef.org/media/>. These pages are updated daily with the latest news from UNICEF around the world and will keep you posted on UNICEF's commitment to the environment.



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Scientists once referred to the issue as 'global warming' but today the term 'climate change' is more widely used as it encompasses both the changes in the temperature (warming) and the changes in weather patterns such as severe storms and melting of the glaciers.

RIGHTS RESPECTING SCHOOLS

The Child-Friendly School (CFS) model is a signature UNICEF approach to promote quality education for every child. The model is a simple one at heart: schools should operate in the best interests of the child. Child Friendly Schools, in 80 countries around the world, provide educational environments that are safe, healthy and protective. They have trained teachers, adequate resources and appropriate physical, emotional and social conditions for learning. These school communities protect children’s rights and ensure that children’s voices are heard. They promote inclusiveness, gender-sensitivity, tolerance, and personal responsibility.

Drawing inspiration from the success of the CFS model, UNICEF Canada is working with schools and delivery partners across Canada on a new initiative for Canadian schools that uses the Convention as a basis for enhancing an inclusive, participatory and respectful school culture. Children learn about their rights and the responsibilities that accompany them. This creates a more positive and peaceful school climate, leading to higher rates of student achievement, lower absenteeism and higher rates of teacher satisfaction.

The Rights Respecting Schools model is not an ‘add-on’ for schools, as it has been designed to support existing ministry and board mandated programs and initiatives.

This guide can support teachers working in Rights Respecting Schools. It provides teachers with rights-based information, resources and activities that work well within the Rights Respecting Schools framework. As students learn about the importance of rights and the responsibilities that accompany them, this climate change resource gives students the chance to apply that rights-based approach to the issue of climate change. Schools that embed children’s rights into their everyday culture have a strong understanding of the importance of making the link between children’s rights in their own country, and the importance of advocating for children’s rights in all countries, especially as they relate to climate change and sustainability.

- For more information about Rights Respecting Schools, please visit rightsrespectingschools.ca
- For more information about Child-Friendly Schools, including a “Climate Change and Environmental Education Module”, please visit unicef.org/cfs/index_121.htm

CANADA’S RESPONSIBILITY TO DEVELOPING NATIONS

In 1987, the World Commission on Environment and Development (WCED) published a report commonly referred to as the Brundtland Report. This groundbreaking work detailed guiding principles for sustainable development and continues to act as the road map for sustainability today. This report defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”³

A key concept of the Brundtland Report that is now commonly accepted is that of the three pillars of sustainability. Simply stated, sustainability cannot be understood as just the environment, there are three factors or pillars that also need to be considered:

- Environment
- Economics
- Society: adults and children.

Our children’s future depends on a balance between the three pillars. We need to nurture and preserve our planet, have the resources (money and labour) to make this happen and ensure global human needs

are met.

As developed nations are fortunate to have in place the resources to balance the three pillars, it is the responsibility of nations like Canada to support developing countries in their struggles with climate change, as stated in Article 24 of the UN Convention on the Rights of the Child:

Children have the right to good quality health care — the best health care possible — to safe drinking water, nutritious food, a clean and safe environment, and information to help them stay healthy. Rich countries should help poorer countries achieve this.

The reality is that citizens of developed nations continue to have the greatest impact on climate change; we are dependent on fossil fuels and overall consumerism to sustain our current standard of living. We need to do our part in restoring the balance of our world and help children in developing countries affected by our actions. We need to educate our youth on solutions, inspire them to take action and lead by example. As we adapt to ending the dependency on fossil fuels and appreciate the value of our natural treasures, we will learn what makes us strong as a global community — the human spirit.

CRITICAL HOPE: AN APPROACH TO TEACHING ABOUT CLIMATE CHANGE

Critical Hope is an approach to teaching a subject like climate change where students—and teachers—can feel overwhelmed and discouraged by the immensity of the problem.

At GreenLearning, we work with classroom teachers who are struggling to do a good job teaching about climate change. They tell us about the everyday challenges they face: science teachers feel out of their depth linking the science of climate change to critical social and economic issues; they note the lack of good resources and of relevant Canadian data; they wonder about how best to address the climate-deniers. But the number one challenge, the one we hear over and over again, is how teachers can reach students who are feeling scared and overwhelmed by our changing climate and who may believe that there is little they can do to make a difference.

An interesting footnote here is that it's not just students and teachers who are feeling overwhelmed—it's everyone. In his research, Glenn Albrecht, an Australian philosopher, says that besides being concerned about the impacts of climate change on the environment and on society, we should also be concerned about the huge toll it will inflict on our mental health. In short, it's making us sad.

How can we as teachers help young people address feelings of hopelessness, move beyond any despair to a more constructive, positive place? Keren Bromberg and Rebecca Niblett Rebecca, in their ***Critical Hope, An Approach to Environmental Education*** offer some practical activities for addressing this challenge, activities that complement the activities in ***Climate Change: Children and Youth***. The next few paragraphs provide a brief, very brief, overview of Critical Hope in teaching a subject like climate change, ending with a few selected activities...

The Oxford English Dictionary says that hope is the “expectation of something desired; desire combined with expectation...” Margaret Somerville stretches and plays with the definition of hope and says, “sometimes courage is necessary if we are to find hope.” Hope requires a sense of connection to the future, and if it is linked to the future, then hope is linked to potentiality and possibility. Somerville also says “...we must make a maximum effort to expel despair, thus keeping our human spirit ‘optimally inflated’ and opening up space within ourselves so that hope can flow in.”

However, Joanna Macy says “despair cannot be banished by injections of optimism or sermons of “positive thinking.” Like grief, despair must be acknowledged and worked through. This means it must be named and validated as a healthy, normal human response to the situation we find ourselves in.” Macy’s work encourages positive environmental connection and identity by recognizing and facing despair

in order to move towards hope. Thus, Macy’s alternative view of the world demonstrates how emotions like hope and despair connect us with the world.¹

Another important idea in fostering hope comes from Popular Educator, Paulo Freire. He says that “...hope is necessary, but it is not enough...We need critical hope the way a fish needs unpolluted water. In this way, combining *popular education*² with *despair work* may be one technique in which to overcome dilemmas faced by environmentalists. While *popular education* illustrates *hegemonic* forces that prevent change while encourages action, *despair work* does this while recognizing the importance of interconnectedness in our world, and thus, we can use both methods, applying them to a wide range of environmental issues for a wide range of people.”³

As you use ***Climate Change: Children and Youth*** with your class, you may become aware of your students feeling anxious or hopeless; the activities in ***Critical Hope, An Approach to Environmental Education*** can help you and your students work through this. The entire Manual is in the COOL 2.0 Database; the following selected activities—also found in the COOL 2.0 database—are good starting points:

Critical Hope: An Approach to Environmental Education:

<http://cool.greenlearning.ca/database/view.html?ItemID=1857>

Critical Hope: Group Introductions: <http://cool.greenlearning.ca/database/view.html?ItemID=1849>

Critical Hope: Widening Circle: <http://cool.greenlearning.ca/database/view.html?ItemID=1851>

Critical Hope: Open Sentences: <http://cool.greenlearning.ca/database/view.html?ItemID=1853>

Critical Hope: I Don’t Care: <http://cool.greenlearning.ca/database/view.html?ItemID=1855>

¹ *Teaching Hope for Action: A Facilitator’s Guide to Creating Action in Environmental Education*, page 8

² Popular education is a concept grounded in social transformation and change. It is an educational practice that started in South America and is influenced by Brazilian literacy educator Paulo Freire. It’s education based on several principals including the idea that students come with their own knowledge and ideas, and that teachers/educators should start with those ideas. Popular education is particularly apt for dealing with an issue like climate change and how it will affect the ordinary person—or student.

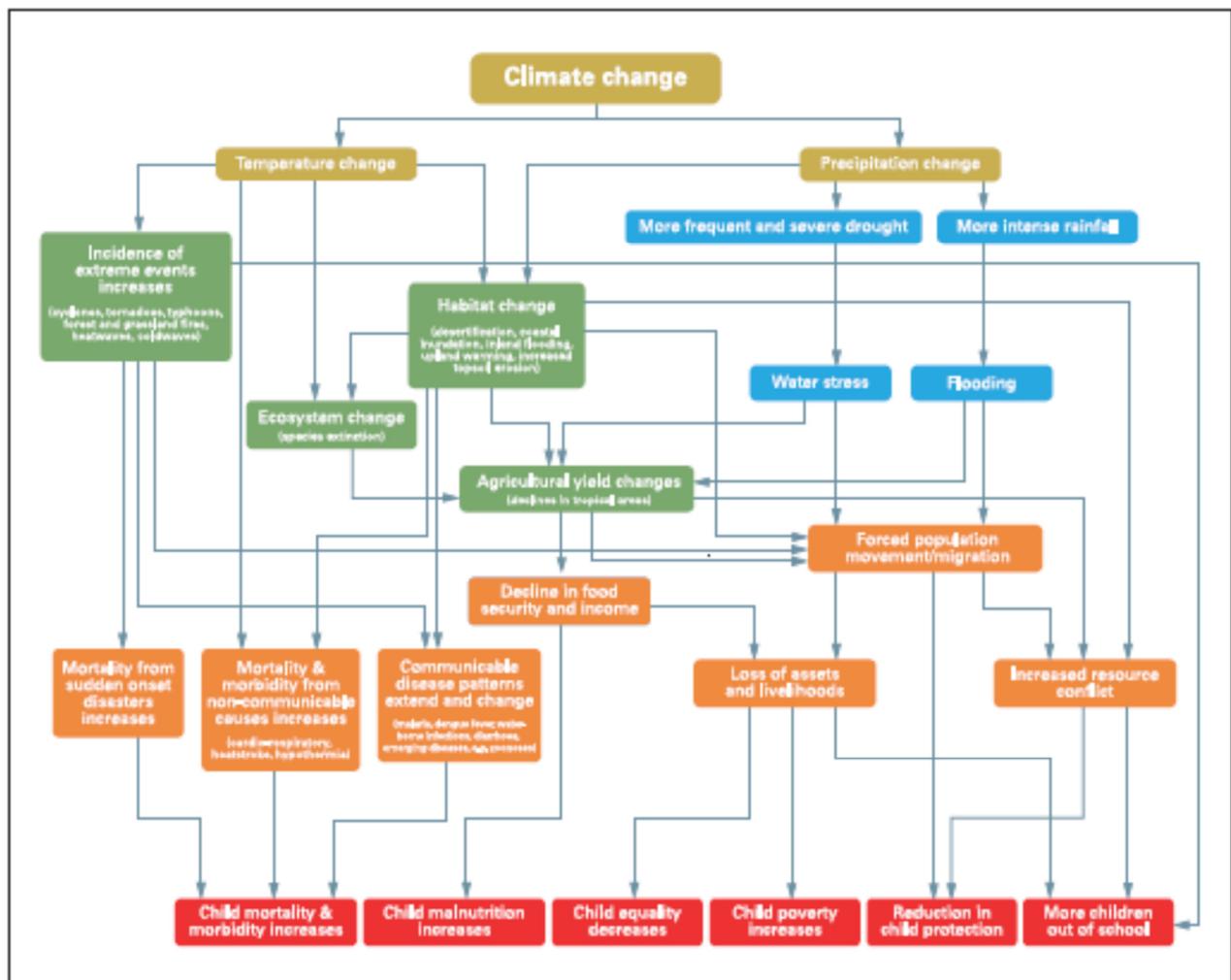
³ *Teaching Hope for Action: A Facilitator’s Guide to Creating Action in Environmental Education*, page 8

CLIMATE CHANGE CONNECTIONS

Climate change is defined as the increase in Earth's temperature due to human impact by way of greenhouse gas emissions. Gases, such as carbon dioxide, build in the atmosphere and form a barrier. This gaseous wall lets the heat from the sun into our atmosphere but does not let it escape, resulting in the warming of the planet. The increase in global temperature means alterations in the world's weather patterns and rising sea levels.

The effects of climate change cannot be viewed in isolation; they are all connected. For example, as the water cycle intensifies both drought and flooding increase. This affects agriculture, increases the likelihood of waterborne disease, and can negatively affect what was once a fertile land rich with resources.⁵

The citizens most vulnerable to climate change and its many connections are children. Since children have developing immune systems and rely on proper nutrition and clean water to progress into adulthood, they are less likely than adults to weather the effects of climate change. A summary of the key impacts of climate change on children is presented schematically below.⁶



YOUTH PARTICIPATORY EDUCATION

Article 12 of the Conventions on the Right of the Child states that children have the right to give their opinion, and for adults to listen and take it seriously. In the working paper, “*The Participation Rights of Adolescents*,” UNICEF identifies 8 positive outcomes from youth participation in social and global issues. Examples of these benefits are outlined below:

- 1) Participation is critical to self-development
- 2) Participation builds effectiveness and sustainability
- 3) Participation fosters learning, builds life skills, and enables self protection
- 4) Participation is integral to the democratic ethos
- 5) Young people’s participation builds civil society⁷

Youth participation involves giving children meaningful opportunities to voice opinions, to participate fully in all aspects of their schooling, to be a valued and genuine participant in decision-making that affects them, and to contribute to resolving obstacles to teaching, learning and well-being. Participatory teaching includes methods such as brainstorming, problem-solving, role-playing, debating and cooperative learning.

This approach sees students as active citizens who are capable of participating in making decisions on issues that affect them, and capable of thinking critically about how their attitudes and behaviours impact the rights of children around the world.

Empowering youth provides them with a voice, the confidence to make a difference, and most importantly, awareness to the reality, that change is necessary.⁸

This guide offers students a chance to engage in global climate change issues, and understand their role in contributing to existing conditions, as well as opportunities for change. Students are encouraged to consider taking action on a personal, school, and community level, as well as at a global scale.



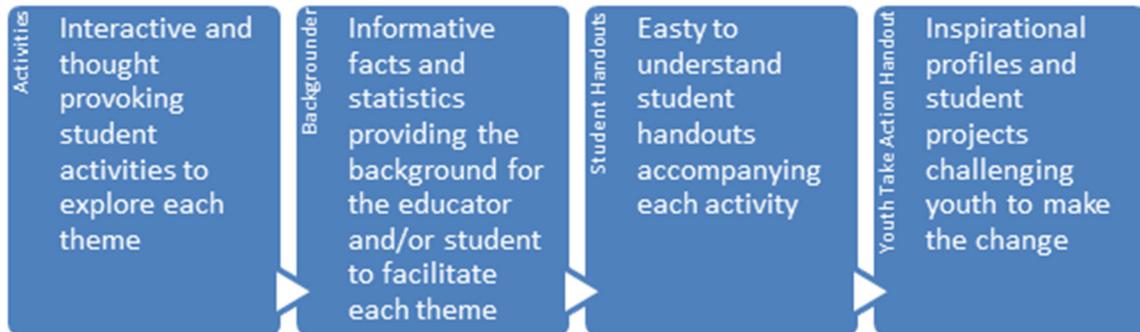
YOUTH TAKE ACTION COMPONENT

Our “Youth Take Action” handouts are truly the essence of empowering students to be the change. Each handout offers a selection of projects upon which students can mobilize. Students will have the opportunity to engage in a project after each theme. Project ideas can be adapted to fit various subject specific curriculum expectations. Projects ideas for each theme enable themes to be started and completed as separate units, enabling the Climate Change manual to be used at various points in the school year, rather than requiring that the entire package be implemented at once.

A rubric to evaluate student projects is provided in Appendix C, “Culminating Task Rubric”

GUIDE OVERVIEW

This guide contains a series of activities with accompanying handouts connected to the six themes: natural disasters, food security, health, natural environments, water and energy. Each theme includes the following sections:



Distribute the handout found on page 139 (Appendix E: Reflect and Act). This handout will allow students to journal lessons learned throughout each theme, or can be used to summarize lessons learned from the entire unit.

The glossary (addressing the underlined words in the guide) and other appendices (including the curriculum expectations/outcomes, United Nations Convention on the Rights of the Child, and a culminating task rubric), can be found in Appendix A.

Please note that all websites referenced in the themes were accurate at the time of printing. UNICEF Canada apologizes for any inconvenience that may be caused due to an inactive link.

AT A GLANCE: SUGGESTED PROGRAM TIME FRAME, WITH LESSON PLAN LENGTHS

Select the lessons as they fit into your own unit plan, or adopt sections of the time frame, or complete the entire series of lessons. Some can be done to supplement another lesson, or can be used as lessons on their own, depending on length of time.

Topic	Activity	Length of Time
Introduction	“Climate Change Connections”	1 hour
	“Climate Change and Child Rights”	30 minutes
Food Security	“Setting the Stage”	15 minutes
	“Food for Thought”	15 minutes
	“Is Your Food Too Warm?”	45 minutes
Health	“Setting the Stage”	15 minutes
	“Healthy Planet”	20 minutes
Natural Disasters	“Every 30 Seconds”	35 minutes
	“Setting the Stage”	10 minutes
	“When Disaster Strikes”	25 minutes
	“Be Prepared”	45 minutes
Natural Environments	“Setting the Stage”	15 minutes
	“Amazing Amazon”	15 minutes
Water	“Forest Fables Card Game”	30 minutes
	“Setting the Stage”	15 minutes
	“Water Run Clean”???	60 minutes
	“To stay or to go?”	40 minutes
Energy	“Setting the Stage”	15 minutes
	“Solar Café”	60 minutes
Closing lessons	“Going to Copenhagen”	2 days
	“What can we do?”	60 minutes
	“Climate Superheroes”	1 hour

EDUCATORS – LET’S GO GREEN!

Students learn by example. Challenge yourself and your colleagues to make a difference and ‘walk the talk.’ It is empowering for students to see how your small changes can make a big difference. Here are some ideas:

- walk, run, bike, train, bus or car pool to school
- have organic, fair-trade coffee and local food for staff social events
- use a reusable travel mug and water bottle
- pack waste-free lunches
- green your classroom; reuse paper, start worm compost in your classroom, recycle blue bin items
- open the blinds and turn off the lights in the classroom
- discover who is working to make a positive contribution to decrease the school's carbon footprint (good recycling habits, turns out classroom lights at the end of the day, packs a litterless lunch, etc.). Celebrate their achievements through sharing them in the school newspaper, on the announcements, or on the school website. Work with a team of students to design how you will gather this information, and to decide in a participatory manner whether to share names of those making a difference, or if it should be done anonymously.
- have students submit their favorite vegetarian and vegan recipes and compile a vegetarian cookbook for the school community
- encourage students to pack a vegetarian lunch to on “Meatless Mondays”: <http://www.meatlessmonday.com/>
- drink tap water
- organize a field trip to your local recycling plant to find out what happens to waste after it is placed in the recycling bin. Have the student's ask questions about sorting and what goes where so that they can share the information with the school when they return.
- collect batteries, printer cartridges and cell phones to donate to a reputable recycling facility that can reuse the items

At your next staff meeting, gather your colleagues and agree to challenge another school to have the greenest staff! How can you get your students involved in the solution?

Meet amazing staff who are leading by example:

- Susan Ng Chung, a science teacher at Prince of Wales Secondary in Vancouver is leading by example. Susan commutes to school on two wheels every other day.
- Graeme Mitchell, a teacher at Stelly's Secondary School in Saanich, BC, developed a popular course called Sustainable Development for Grade 11 students. The goal is to shed light on models, tools and ideas that already exist, and, that if widely adopted, would completely change our world for the better.
- Staff at Appleby College in Oakville run a competition to encourage students not to waste food. They weigh the green bin at the end of each meal in the cafeteria to see how much wasted food remains at the end of lunch. Over the year, they aim to reduce the amount of food wasted at lunchtime and encourage students to only take what they can eat.

NOTES

1. UNICEF UK, Our climate, our children, our responsibility (York: UNICEF UK, 2008), p. 12.
2. UNICEF Innocenti Research Centre, Climate Change and Children: A Human Security Challenge (Florence: UNICEF Innocenti Research Centre, 2008), p. 2.
3. World Commission on Environment and Development, The Brundtland Report, <http://www.un.org/documents/ga/res/42/ares42-187.htm> (accessed November 2009).
4. Toronto District School Board, Ecoschools: Climate Change in Grade 11 and 12 Science (Toronto: Toronto District School Board, 2004), p. 9.
5. UNICEF UK, Our climate, our children, our responsibility, p. 4.
6. Ibid., p. 3.
7. UNICEF, The Participation Right of Adolescents: A Strategic Approach. Work paper series. UNICEF, New York, 2001.
8. Citizenship Foundation UK, What is Citizenship Education? 2010. <http://www.citizenshipfoundation.org.uk/main/page.php?286>

THEMES



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Pakistan, 2007

A girl stands in the Nasirabad camp in Kech Valley in Balochistan Province, one of the worst-affected areas. The camp is home to 25,000 people displaced from eight villages, many of whom are sleeping in the open. Up to six families are sharing the few tents available. Some of the children have developed skin infections from the extreme temperatures (which average 50 degrees centigrade) and from poor hygiene conditions in the camp, whose only sources of water are a well and a river located 1 km away. An estimated 75,000 of Kech Valley's 500,000 inhabitants were displaced by flooding caused primarily when a nearby reservoir overflowed as a result of heavy rains in the wake of Cyclone Yemyin. Homes in more than 20 villages were swept away, and nearly 95 per cent of the yearly date harvest, Kech's most-important income source, was destroyed. UNICEF has provided blankets, water-purification tablets, tents, jerry cans, emergency health kits and other relief supplies for flood-affected children and families in Balochistan.

CONNECTING THE THEMES

© UNICEF/NYHQ2012-0264/Asselin;



Burkina Faso, 2012

Fati Bikinga works in her onion patch while carrying her 18-month-old daughter on her back, in the village of Boalin, Plateau-Central Region.

INTRODUCTORY ACTIVITY

Climate Change Connections

Objective: To discuss issues facing children in the world today, and to discover how climate change can intensify these issues. This activity is intended to introduce students to all the themes presented in the guide—natural disasters, food security, energy, health and water. Climate change has evolved from an ‘environmental’ issue into one that requires collective expertise in sustainable development, energy security, and the health and well-being of children. The themes in this guide have been chosen because they reflect the far-reaching and interconnected nature of this global climate crisis. See Appendix D: How Climate Change Affects Children for a visual representation of these connections.

Time: 60 minutes

Materials

- Coloured marker for each student
- Reused paper for each student (personal white boards or laptops)
- Student Handout #2: Climate Change and Children
- Appendix D: How Climate Change Affects Children (page 138)

- Clip #1: Climate Change and Children:
http://globalclassroom.unicef.ca/en/resources/resource_guide.htm
- Flip chart and markers
- Photocopies of testimonials

ACTIVITY

1. Ask students to consider what is the most important issue facing children in the world today. Examples may include poverty, hunger, mortality rates, drinkable water and climate change.
2. Instruct each student to record his or her answer on paper, in large writing, using only one or two words for the answer.
3. Ask students to circulate the room and read what everyone has written. This is to be done in silence.
4. Ask everyone to pair up and discuss his or her respective issues.
5. Stop the class, and ask student pairs to choose only one issue with which to go forward, and to be prepared to talk about it with a larger group. Ask pairs to hold the one piece of paper between them and circulate the room and form a larger, like-minded group with another pair of students. Ask groups to discuss the commonalities in their larger group.
6. Explain that in some countries, climate change is visible and has affected the way many people – including children – live. Explain that they will now read *testimonials/case studies on three different countries produced by young Climate Ambassadors (explain what Climate Ambassadors are – see box below and refer to the specific section on this in the Student’s Handout)*.
7. Form three (or six, depending on the size of your group) small groups and distribute a story to each group/person. Give them a few minutes to read the content individually (*or, depending on your class’s reading skills, you can choose to nominate one reader per group*).
8. Ask each group to identify, discuss and note down the following elements in their texts (write down the three questions on the flipchart so that they are visible):
 - a. Effects of climate change. (What has changed in these countries because of climate change? Ex. weather, poverty, etc.)
 - b. Specific impacts/consequences of climate change for children living in these countries.
 - c. How people in these countries are reacting to this.
9. Give participants some time to discuss this internally and then invite each group to report back to the class as a whole by (1) presenting their stories to the others, and (2) explaining their findings for questions a, b and c. Note those down on the flipchart and complete with what is missing. (*Solutions are appended to this activity.*)
10. Show the clip Climate Change and Children on the UNICEF Canada site:
<http://www.unicef.ca/en/teachers/article/climate-change-and-children%E2%80%99s-rights>, a UNICEF video that details how the effects of climate change are affecting children in developing countries. Ask students to share what they learned about the connection of climate change to

Some students may have difficulty accessing YouTube clips while at school, so we have provided many of them directly on the UNICEF Canada Teacher website at <http://www.unicef.ca/en/teachers/article/climate-change-and-children%E2%80%99s-right>

children.

11. After viewing the clip, ask students to complete Student Handout #2: Climate Change and Children.

Keep the discussion going

Review the connections between the topics discussed today. For example, how does poverty affect the health of children? How do natural disasters affect the water supply for children? You may want to record all issues discovered in class on the board, or distribute Appendix D: How Climate Change Affects Children (page 138), so the students have a visual of the issues.

Was there group consensus as to what is the most pressing issue facing children today? Why or why not?

What global stories about children affected your decision?

What can Canadians do to help children in developing countries?

Climate Change and Child Rights

Objectives: By the end of the activity participants will be able to:

- Explain why and how child rights are affected by climate change
- List (at least) five child rights that can be undermined by climate change

Time: 30 minutes

Materials:

- Sets of CRC cards (*see Handout #3*)
- Flipchart and markers
- Scissors

ACTIVITY

1. Begin the activity by brainstorming about child rights to determine how familiar the group is with the CRC and/or reminding them of what they may previously have learned about child rights.
2. Form small groups of three or four and distribute a set of cards to each group. Invite them to go through the cards and select the rights that are affected because of climate change. Give them about 10 minutes.
3. Ask one of the groups to present *one* right identified and explain why they chose it and how it relates to climate change. Then ask another group to present and explain another one, and so on. Continue until there are no further suggestions. Note down all the rights on the flipchart. Complete if any are missing.

Keep the Discussion Going:

Refer back to the flipchart with causes, consequences, impacts and rights to make sure that all the participants have understood all the connections.

Ask participants what they learned in this activity. Are they surprised?

CRC articles that are linked to climate change

The United Nations Convention on the Rights of the Child outlines the rights that children everywhere have: the right to survival; the right to develop to the fullest; the right to protection from harm, neglect and exploitation; and the right to participate fully in family, cultural and social life. These rights are universal (all children have them); interdependent and indivisible (one right cannot be upheld without, or at the expense of other rights); inalienable (they cannot be taken away); and non-discriminatory (they cannot be denied based on factors such as religion, age, etc.). However, when exploring climate change, the articles listed below may be particularly helpful in making the impact of climate change clearer to your students.

You can also refer to the part of the Introduction section that refers to the Convention on the Rights of the Child.

Article 6: Right to life (survival and development)

Climate change can have an impact on food and clean water availability, and undermine the chances of development and survival of affected children.

Article 12: Respect for the opinions of the child

Children have the right to express their opinions on all matters affecting them. As climate change is clearly affecting their present and future lives, they should have their say.

Article 22: Refugee children

Climate change creates climate refugees—people and families who have to leave their homes because they cannot survive there any longer (drought-affected zones, coastal areas affected by rise in sea levels, etc.).

Article 24: Right to health and health care

Consequences of climate change such as drought, flooding, increase of diseases, etc., have a direct impact on the health of children.

Article 28: Right to a free education

When natural disasters such as flooding, hurricanes and other extreme events occur, schools can remain closed for a long time, either because they have been destroyed or because children are kept at home to help with the reconstruction work.

Article 38: War and armed conflict

Climate change can cause conflicts over resources that have become rarer because of changes in the environment (such as drought, rising sea levels, etc.).

There are many other articles of the CRC that can be linked to climate change and its consequences on children. We are sure that you and your group will come up with many more!

Here are some ideas:

- Article 11 (protection from international kidnapping)
- Article 16 (right to privacy)
- Article 21 (adoption)
- Article 27 (right to adequate standard of living)
- Article 31 (right to leisure, play and culture)
- Article 34 (protection from sexual exploitation)
- Article 35 (protection from abduction, sale and trafficking)
- Article 36 (protection from other forms of exploitation)

Student Handout #1

TESTIMONIALS BY CLIMATE AMBASSADORS

Laoniman (boy), 17 years old, from Kiribati

Kiribati (pronounced Kiribas) is an independent republic within the Commonwealth of Nations, located in the central Pacific Ocean about 4,000 km (about 2,500 miles) southwest of Hawaii. It is part of the division of the Pacific islands known as Micronesia. Kiribati consists of 33 coral islands, 21 of which are inhabited. The majority of the atolls are barely more than 6 metres (20 feet) above sea level.⁴

Climate change has many visible effects in my country. The one that affects us most is the rise of sea level, which causes coastal erosion and the contamination of well water⁵. Since the well water is contaminated, we must rely more on rain as a source of water, but it is raining less and less, which means that we don't have much clean water for our daily living. Also, many plants in my country die because of the change in rainy seasons.

Since the sea is covering our lands, the soil is becoming infertile and it is becoming very difficult to grow crops and other plants. Moreover, we mostly rely on the sea as a source of living: we get food from the sea and fish is a source of income for many families. But fish is becoming scarce...

As a consequence, some families in Kiribati, and especially in the capital island Tarawa, were forced to move out of their houses, which were close to the coast. The sea was getting too close to their homes and even ruined some of them. Some families, who are concerned about losing their land, are building sea walls at their own costs. This is very expensive and some families don't have any money left. As a consequence, many fathers become depressed because they cannot support their families; some of them leave and some others waste the little money left on alcohol.

All this seriously affects children. Some of them cannot go to school anymore because the family has no money to pay for the fees and material. Young girls get married very early just to get away from their family's problems. Teenage pregnancy and family corruption is common. Also, more and more children can be seen begging for loose change or food in the streets.

Since the effects of climate change are becoming more visible, the population is aware of what is happening, but they don't understand why it is happening to them since they are not responsible for the causes. The government is putting up projects to fight all these problems. Right now they are building pipes that transport water to the whole capital island and are working on more projects that will benefit our country. But, still, we need more assistance from other countries because we lack resources.

⁴ Source: Kiribati national tourism organization

⁵ A **water well** is an excavation or structure created in the ground by digging, driving, boring or drilling to access groundwater in underground aquifers.

TESTIMONIALS BY CLIMATE AMBASSADORS

Ndeye (girl), 16 years old, from Senegal

Senegal is a country in western Africa. It is externally bound by the Atlantic Ocean to the west, Mauritania to the north, Mali to the east, and Guinea and Guinea-Bissau to the south; internally it almost completely surrounds the Gambia, namely on the north, east and south, exempting Gambia's short Atlantic Ocean coastline. The climate is tropical with two seasons: the dry season and the rainy season.

Climate change has numerous visible effects in my country, Senegal. The most important are flooding, drought, spread of the Sahara Desert, the increase of temperatures and coastal erosion due to the rise of sea levels (for instance, a fishermen village called Djiffer, located in the Saloum Delta, is disappearing).

I would like to talk about recent heavy rainfalls, which caused flooding. Many families lost their houses and have nowhere to live. Some children haven't gone back to school after the flooding, because the school buildings were not repaired. Also, some children caught malaria because stagnant water multiplied the mosquitoes. Other vector-borne diseases that spread are bilharzias⁶ and cholera⁷.

Unfortunately, people are generally not worried about climate change. But, together with other Climate Ambassadors, I am going to organize campaigns and other projects to raise awareness among the population. The Senegalese government is also initiating projects, for instance one together with other African countries called "Great Green Wall", whose goal is to plant 7,000 km (4,350 miles) of trees, in a line from Dakar to Djibouti, to halt desert spread.

⁶ Bilharzia is a human disease caused by parasitic worms called Schistosomes.

⁷ Cholera is an infectious gastroenteritis. Transmission to humans occurs through eating food or drinking water contaminated by other cholera patients.

TESTIMONIALS BY CLIMATE AMBASSADORS

Sabrina (girl), 16 years old, from Canada

Canada is a country in North America. It is bordered by the Atlantic Ocean in the east, the Pacific Ocean in the west, the Arctic Ocean in the north and the United States in the south. Canada's climate is not as cold all year long as some may believe. In the winter, temperatures fall below the freezing point throughout most of Canada, but the southwestern coast has a relatively mild climate. During the summer months the southern provinces often experience high levels of humidity and temperatures that can surpass 30 degrees Celsius (86 degrees Fahrenheit) regularly. Western and southeastern Canada experience high rainfall, but the Prairies are dry.

Climate change has had a variety of effects in my country. First of all, the permafrost in the North is melting at a dazzling speed due to the increasing temperature of the Earth. In the northern towns, houses built directly on the ground are collapsing and families then have to move to other places. Also, while winters are getting warmer and wetter, summers in southern Canada are getting warmer than the global average and drier. These changes dramatically affect the ecozones and the natural environment across Canada. The recent increases of climatic and extreme weather phenomena have caused significant losses of forests by fires, floods, detachment of ice platforms from the Antarctic Peninsula and an increased frequency of strong winter storms and hurricanes. Climate change in Canada is also affecting children and their lives, especially those who live in the northern part of the country where climate change strikes most.

Over the last few years, people have changed their minds about the environment and have started to recycle and do some gestures to show that they care about it. Now, I can say that young Canadians and Canadians in general are aware of what is going on all around the world; while our government still doesn't want to face the problem, the population is ready to commit. The climate change issue is actually a hot topic in Canada. It is even being discussed on television, radio and in newspapers!

As usual, young people are much more aware about this international issue than older citizens. Therefore, we must not only act by ourselves, we also need to empower the people around us to go out and make a change. On the other hand, we must not forget that there is still a lot of sensitization work in the population to do, even on an international scale.

TESTIMONIALS BY CLIMATE AMBASSADORS

ANSWER KEY

Question	Laoniman (Kiribati)	Ndeye (Senegal)	Sabrina (Canada)
a. Effects of Climate Change	<ul style="list-style-type: none"> - Rise of sea level - Coastal erosion - Contamination of well water - Less rain / change in rainy seasons - Many plants die - Scarcity of fish <p>= Rise of sea level and drought</p>	<ul style="list-style-type: none"> - Flooding - Rise of sea level - Coastal erosion - Higher temperatures - Spread of the Sahara Desert - Drought <p>= Flooding, rise of sea level and drought</p>	<ul style="list-style-type: none"> - Warmer and wetter winters - Increase of strong winter storms and hurricanes - Changes in ecozones and natural environment - Loss of forests by fires and floods <p><i>In Northern Canada:</i></p> <ul style="list-style-type: none"> - Permafrost melting quickly - Detachment of ice platforms - Houses collapsing <p><i>In Southern Canada:</i></p> <ul style="list-style-type: none"> - Warmer and drier summers <p>= Melting of ice, extreme events, change in seasons</p>
b. Consequences for people and children	<ul style="list-style-type: none"> - Move from houses by the coast - Build protection walls (expensive) - Poverty - Many fathers become alcoholic or leave - Girls get married earlier / pregnancy - Corruption - Children have to beg for loose change <p>= Poverty</p>	<p>Because of flooding:</p> <ul style="list-style-type: none"> - Many houses were destroyed - Many schools were destroyed - (As a consequence): interruption of schooling - Spread of waterborne diseases (malaria, bilharzias, cholera) <p>= School dropout, spread of diseases</p>	<ul style="list-style-type: none"> - Because of permafrost melting, many families in Northern Canada have to move somewhere else <p>= Forced migration</p>
c. Reactions	<ul style="list-style-type: none"> - People don't understand why this is happening to them - Government is building pipes to transport clean water - International community should help 	<ul style="list-style-type: none"> - Population not very concerned by climate change - Climate ambassadors are setting up awareness-raising projects - Government: Great Green Wall project 	<ul style="list-style-type: none"> - Population, esp. young people, more and more concerned, ready to commit (recycling, etc.) - Government does not want to face the problem - Climate change is discussed in the media

Student Handout #2

CLIMATE CHANGE AND CHILDREN

Question and Answer

1. An action that saves the planet also helps meet the basic rights and needs of children. Explain this statement:

2. How does climate change threaten the basic necessities of human survival?

3. While many of the Earth's resources are threatened by climate change, one resource remains unchanged: the power of youth to affect positive change.
 - a. List three actions you can personally take to help stop climate change, and explain how they contribute to the fight against climate change. For example, I can ride a bike instead of getting a drive.

 - b. List three actions you can take in your community to help stop climate change, and explain how they contribute to the fight against climate change. For example, I can advocate for better waste management practices in my community.

 - c. List three actions you can take globally to help stop climate change, and explain how they contribute to the fight against climate change. For example, I can support global organizations tasked with the job of stopping climate change.

Some students may have difficulty accessing YouTube clips while at school, so we have provided many of them directly on the UNICEF Canada Teacher website at <http://www.unicef.ca/en/teachers/article/climate-change-and-children%E2%80%99s-rights>

Student Handout #3

CRC CARDS

Article 1: Child = 0–18 years	Article 2: All rights for all children (non-discrimination)	Article 3: Best interests of the child
Article 4: Full enjoyment of rights	Article 5: Parental guidance (<i>right to</i>)	Article 6: Life (survival and development) (<i>right to</i>)
Article 7: Birth registration (<i>right to</i>)	Article 8: Identity (name, nationality) (<i>right to</i>)	Article 9: Keeping family ties (<i>right to</i>)
Article 10: Family reunification (<i>right to</i>)	Article 11: International kidnapping (<i>protection from</i>)	Article 12: Respect for the opinions of the child
Article 13: Freedom of expression (<i>right to</i>)	Article 14: Freedom of thought, conscience and religion (<i>right to</i>)	Article 15: Freedom of association (<i>right to</i>)
Article 16: Privacy (<i>right to</i>)	Article 17: Access to child-friendly information (<i>right to</i>)	Article 18: Parental responsibilities; state assistance
Article 19: Violence (<i>protection from</i>)	Article 20: Alternative care (<i>right to</i>)	Article 21: Adoption

Article 22: Refugee children	Article 23: Children with disabilities	Article 24: Health and health care (<i>right to</i>)
Article 25: Review of treatment in care (<i>right to</i>)	Article 26: Social security (<i>right to</i>)	Article 27: Adequate standard of living (<i>right to</i>)
Article 28: Free education (<i>right to</i>)	Article 29: Goals of education	Article 30: Protection of children of minorities/indigenous groups
Article 31: Leisure, play and culture (<i>right to</i>)	Article 32: Child labour	Article 33: Drug abuse (<i>protection from</i>)
Article 34: Sexual exploitation (<i>protection from</i>)	Article 35: Abduction, sale and trafficking (<i>protection from</i>)	Article 36: Other forms of exploitation (<i>protection from</i>)
Article 37: Detention and punishment	Article 38: War and armed conflicts	Article 39: Rehabilitation of child victims
Article 40: Children in trouble with the law	Article 41: Respect for superior national standards	Article 42: Informing about children's rights

FOOD SECURITY



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INTRODUCTION

Food is an essential ingredient of life; without it we cannot survive. Intimately connected to food and its production are poverty and health. When food production is affected by climate change, so are people's health and economic wellbeing. As we have already seen through devastating weather events such as the droughts in northern Africa and unexpected frosts in California, climate change is affecting our ability to produce food around the world. Malnutrition and starvation, in the extreme, is already a leading cause of infant and child mortality in developing countries.¹ Climate change is likely to exacerbate this further.

Food production in developed countries is not immune to the impacts of climate change either. With increasing natural disasters, agricultural lands can be degraded or even destroyed, decreasing the availability of food. Consequently, food prices increase, which can negatively impact nutrition of poor families in the developed world.

What can we do to moderate the impacts of climate change on food production? Consumers in the developed world could, for example, consider the ecological footprint of their food. In developing countries,

Pakistan, 2006

A boy eats a meal at the Government of Punjab's Child Welfare and Protection Bureau in Lahore, capital of Punjab Province. The UNICEF-assisted centre provides food, shelter, educational assistance, psychosocial counselling and family tracing and reunification services to children who live and work on the streets. The centre also assists repatriated victims of child trafficking, including former 'camel jockeys' from the United Arab Emirates.

food production is generally locally produced. In Canada, on the other hand, most of our food travels thousands of kilometers to reach our plates. That trip generates greenhouse gases, which add to the effects of climate change.

Producing healthy food to feed everyone is possible but first we need to understand the issues. We need to work together to adopt local solutions with global impacts such as growing food locally/regionally, eating seasonally and eating a less carbon-intensive plant-based diet.

ACTIVITIES

The curricula links below are addressed in this theme. For an extensive list of relevant provincial expectations/outcomes, refer to Appendices G and H: Curriculum Links on pages 142 and 146, and Appendix I for links in Alberta, Saskatchewan, Manitoba and Quebec on page 156.

Province	Course	Expectation/Learning Outcome
Ontario	HFN10 and HFN20 Grades 9 and 10 Social Sciences and the Humanities: <i>Food and Nutrition</i>	Diversity, Interdependence and Global Connections Complete an investigation of current global issues related to food (e.g., food distribution, food shortages, gene manipulation), using current social science research methods.
Ontario	HF4AM Grade 12 Social Sciences and the Humanities: <i>Food and Nutrition Sciences</i>	Personal and social Responsibilities determine the relationship among nutrition, lifestyle, health and disease.
British Columbia	Science and Technology 1 <i>Agriculture</i>	Describe the elements of agricultural systems found locally, provincially, and globally. Describe the role of genetics in agriculture.
British Columbia	Geography 12 <i>Resources and Environmental Sustainability</i>	Assess the environmental impact of human activities, including: <ul style="list-style-type: none"> • Energy production and use • Forestry • Agriculture • Waste disposal • Water use

Setting the Stage

Objective: To define food security as it relates to climate change.

Time: 15 minutes

Materials

- Scrap paper for each student (or personal laptops)
- Appendix E: Reflect and Act (page 139)
- Movie Clip: *2 Lives: 2 Miles// Food* available at:
http://www.youtube.com/watch?v=HTbvPN8hNNg&list=PLD6AA4215618717BB&index=4&feature=plpp_video

ACTIVITY

1. Explain that you will be discussing the connection between food security and climate change; share how climate change can magnify the global food crisis already facing children in developing countries.
2. View the clip, *2 Lives: 2 Miles// Food* asking students to compare and contrast the relationship with food and food preferences of each boy in the clip.
3. Distribute to each the Appendix E: Reflect and Act on page 39 and ask students to journal lessons learned from the clip, as well as during discussion and activities around the theme.
4. Ask the students to consider the term “food security.” What does it mean?
5. Instruct students to write down five words that they would use to describe food security; create a master list of words on the board.
6. Discuss the fact that food security means the availability of food and how people are able to obtain that food. For example, there may be plenty of food in the world, but not everyone has the same access to it.

Food for Thought

Objective: To engage students in critical thinking discussions around global food security and climate change.

Time: 15 minutes

Materials

- Photos (page 35)
- Student Handout #5: Circles

ACTIVITY

Arrange students into six groups.

1. Explain that you will discuss global food security and hand out photos to each group. Instruct students to discuss the photos and captions.
2. Remind students of the definition of food security. You may want to have this definition displayed on the board. Ask students to share how the photos relate to this definition.
3. Ask students to think of a place in the world where food is scarce. Explain that there are many reasons why food security issues can arise, and most are magnified because of climate change.
4. Distribute Student Handout #5: Circles (page 44) and instruct students to decide how each circle might relate to food security connected to climate change. How are these effects magnified for children? Record answers in each circle. Possible answers for each circle are:

Health: Malnourished children cannot fight off infection as well as children who are nourished. Climate change affects crop production; children are at risk of malnutrition.

Natural disasters: As floods and droughts worsen with climate change, it will be more challenging to grow food in many areas; this adds to the malnutrition of children in developing countries.

Natural environments: One reason why there is excess CO₂ in the atmosphere is because we are cutting down our irreplaceable old growth trees, which act as necessary carbon sinks. As we lose our trees, the soil erodes and can lead to land degradation and desertification, which makes select crops harder or impossible to harvest.

Population: With our world population on the rise, we have more children to feed. Climate change is affecting crops and livestock, especially in developing countries, making it even harder to feed a growing global population.

Poverty: Developing countries don't have the resources in place to weather a period of food shortage, and children are more vulnerable.

Water: The water cycle is affected by climate change, which results in less water available for agriculture and failure of crops. This in turn adds to the malnutrition of children in developing countries.

Nature is a series of balances but humans are impacting the natural rhythms of the planet; we are changing the natural global carbon cycle by excessively burning fossil fuels. "Forests, soil, oceans, the atmosphere, and fossil fuels are important stores of carbon. Carbon is constantly moving between these different stores that act as either 'sinks' or 'sources.' A sink absorbs more carbon than it gives off, while a source emits more than it absorbs. Before the Industrial Revolution, the amount of carbon moving between trees, soil, oceans and the atmosphere was relatively balanced." By burning oil, coal and gas, we have far more "sources" than "sinks" and this alters the natural balance.



In Niger, community gardens nourish hope.



A barefoot boy stands on parched, cracked soil in southern Malawi. In 2005, drought caused a massive food shortage that left 4 million people without adequate food supplies.

Keep the discussion going

1. Which food security circle(s) is most affected by climate change? Why?
2. How are the food security circles connected to each other? Draw a web to connect the circles to each other. *Refer to Appendix D: How Climate Change Affects Children (page 138).*
3. Climate change affects crops by making it harder to grow food in extreme environments like drought conditions, but how does the decrease in crops affect climate change?

Plants are carbon sinks as they remove carbon dioxide from the atmosphere. The less plants, the more greenhouse gas emissions (ghg) being released.

4. Why is rainforest deforestation not the ideal method of making way for crop harvests? What are some effective approaches to taking action against this practice?

One reason is that trees are ideal carbon sinks since they can store carbon longer than plants. The less carbon sinks available, the greater the release of CO₂ into the atmosphere; the result is climate change. Children in developing countries are the most susceptible to climate change. Ensure wood products come from a sustainably-managed forest.

Is Your Food Too Warm?

Objective: To understand that climate change is negatively affecting food supplies in developing countries and therefore magnifying the problem of childhood malnutrition. Also, to discover that the process by which most of North America's food reaches our plates is significantly impacting climate change.

Time: 45 minutes (plus 20 minutes, if students calculate their ecological footprint)

Materials

- Food Trivia Tango (below)
- Four signs placed around the classroom: one sign for each of the letters A, B, C, D
- Reused paper for each student (personal white boards or laptops)
- Student Handouts #6, 7, 8: Food Facts Cards
- Clip #2: Fix the Food Chain at http://globalclassroom.unicef.ca/en/resources/resource_guide.htm and www.unicef.ca/climatechangeresources

ACTIVITY

1. Place signs (one sign for each of the letters A, B, C, D) in four different locations in the classroom.
2. Read the first question and ask students to decide whether the answer is A, B, C or D and move to the appropriate place in the room. Reveal the answer, ask for feedback, and read the next question.
3. Here are the questions. The answers appear in bolded text below. These questions are adapted from David Suzuki's Green Guide, unless otherwise stated.³ Suggestion: To prepare for this

activity, you might want to assign students the task of researching the answer to one question the night before you do this activity. This may elicit better discussions at the end of the activity.

- Raising livestock contributes more to climate change than the worldwide transportation sector.
 - a) **True** b) False
- The use of chemical pesticides increased by what percentage in the U.S. during the second half of the 1900s?
 - a) 80% b) 200% c) **600%** d) 750%
- The U.S. Environmental Protection Agency estimates that agriculture is responsible for what percentage of the nation's water pollution?
 - a) 80% b) **70%** c) 50% d) 30%
- When raising cattle, how many litres of water does beef require per kilogram?
 - a) **70,000 litres** b) 40,000 litres c) 10,000 litres d) 1,000 litres
- Millions of hectares of rainforest have been cut down for livestock grazing and feed crops (corn and soy) since 1970. This loss of rainforest is significantly adding to climate change.
 - a) **True** b) False
- According to the UN News Centre, rising greenhouse gas emissions threaten what percentage of the key fishing grounds? ⁴
 - a) 80% b) **75%** c) 50% d) 20%
- This loss of fishing grounds could affect how many people who derive their protein from seafood worldwide? ⁵
 - a) 2.9 million b) 10 million c) 4.5 billion d) **2.6 billion**

Read the UN News Story on climate change and fish stocks: Climate change leading to shrinking fish stocks, UN says.
<http://www.un.org/apps/news/story.asp?NewsID=25716&Cr=fish&Cr1>

Check out the following for more information about climate change and over-fishing:

Natural Numbers 01: Sardines [video] -- http://www.youtube.com/watch?feature=player_embedded&v=svbrEGUMpxk

Fish to shrink by up to a quarter due to climate change, study reveals [article] --
<http://www.guardian.co.uk/environment/2012/sep/30/fish-shrink-climate-change>

Threatened Fish Stocks Need More Management, Analysts Say [article] -- <http://geneva.usmission.gov/2013/01/16/threatened-fish-stocks-need-more-management-analysts-say/>

4. Knowing your ecological footprint is a good starting point to making change. As the food we choose can have a significant impact on our ecological footprint, students should first calculate their ecological footprint, if they have not done so recently. The ecological footprint measures the amount of nature's resources an individual, a community, or a country consumes in a given year. Here is a quick ecological footprint analysis students can complete:
<http://www.myfootprint.org/>.

Dr. William E. Rees, a professor at University of British Columbia's School of Community and Regional Planning, is best known as the co-creator of 'ecological footprint analysis'. "Ecological footprint analysis is an accounting tool that enables us to estimate the resource consumption and waste assimilation requirements of a defined human population or economy in terms of a corresponding productive land area."⁶

5. Explain how by eating a local, organic, mainly plant-based diet, we can significantly lower our ecological footprint and therefore reduce the release of CO₂, which is proven to contribute to climate change.⁷ If we can regulate the Earth's climate, we can improve global food security issues. As children are most affected by climate change, this will help to end malnutrition around the world. (students may refer to the David Suzuki book)

6. Discuss the 100 Mile Diet, which is a low carbon diet. This simple approach to thinking locally in terms of your food means that in order to contribute to a 100 Mile Diet, food must travel no more than 100 miles to reach your plate. Instruct students to create a meal and list of ingredients that follows this diet. Ask students what challenges they encountered when creating their meal. How can they incorporate elements of this into their diet on a daily basis?

Inspired by the fact that the average North American's food travels over 1500 miles from farm to plate, Alisa Smith and J.B. MacKinnon committed, for one year, to eating foods that travel no further than 100 miles (or 160 km) to their plate. Read their story at <http://100milediet.org/>.

7. Arrange students into six groups. Give each group one of the three Student Handouts #6, 7, 8: Food Facts Cards on the actions (buying local, eating organic and reducing meat/eggs/dairy) we can take to significantly lower our ecological footprint. Record answers to the questions listed on the handouts.

8. Have groups share results. Ask students to consider further food actions that will lower their footprint. For example, choosing whole foods, which require less packaging and processing, over highly processed foods which in turn saves energy and greenhouse gas emissions.⁸

9. Show the Friends of the Earth clip on Join The Food Chain Campaign (a campaign in the UK to educate citizens on the environmental impacts of our food choices) and discuss. This clip can be found at
http://www.foe.co.uk/campaigns/biodiversity/press_for_change/join_food_chain_campaign_17315.html.

For students that want to investigate Fair Trade items, TransFair Canada is a non-profit certification and public education organization that promotes Fair Trade Certified products. The primary benefit of Fair Trade Certified is to ensure world farmers get a decent wage for their products.

TransFair Canada monitors every step of a product from production to consumer to ensure fairness for farmers and farm workers in developing countries. By supporting Fair Trade companies, we are helping alleviate the effects of poverty on food security. Visit <http://transfair.ca/en/node> for more information.

How can you make your school a Fair Trade environment? Learn about Fairtrade Schools in the UK at <http://www.fairtrade.org.uk/schools/>. This program is supported by UNICEF UK.

Keep the discussion going

If you ride a bike instead of driving a car, you are significantly reducing your ghg emissions. If you are also a vegetarian, you may be able to double your reduction of emissions!

For example, meat requires significantly more fossil fuels to produce than plant-based foods. Plus, plants are carbon sinks whereas meat is not. Refer to the article (Lose weight to help the planet, researchers recommend, at <http://www.cbc.ca/health/story/2009/04/19/obese-global-warm.html> that discusses the relationship between over-eating and the burning of fossil fuels.

Does buying local, organic food help children in developing countries? Why or why not?

Buying local food means the environmental impact of transporting our food is significantly reduced, resulting in less ghg emissions being released into the atmosphere. As children are most susceptible to climate change, reducing the greenhouse gases, and therefore the effects of climate change, will benefit global children. Also, choosing organic produce helps limit the pesticides in the environment.

If you adopt the 100 Mile Diet, what foods would be difficult to get within a 100-mile radius?

Coffee, chocolate, tropical fruit and certain grains are not generally produced locally. Also, areas like Northern Canada have shorter growing seasons, which affect availability of certain foods throughout the year.

What are the benefits of a farmer's market? Where is the closest market?

Farmers markets are good sources of local and/or organic foods. Ontario residents can visit <http://www.farmersmarketsontario.com/> to find a market, and B.C. residents can visit <http://www.bcfarmersmarket.org/>. You can also check out <http://www.foodkm.com>.

How are genetically modified (GM) foods connected to food security and climate change? Prepare a debate on the issue, with one side debating the positives and the other the negatives of allowing the continued production and research of GMs.

Experts are divided on whether or not GMs could be a solution for food security; especially since climate change is magnifying the world food crisis and leaving children undernourished.

Is organic farming better than conventional agriculture in terms of climate change?

Some experts believe organic farming uses more land, so is less efficient. However, the use of pesticides and fertilizers is adding to our dependency on fossil fuels and adding to our ghg emissions as well as depleting our soils rendering areas unsuitable for farming. Check out this article, which discusses the debate between organic versus conventional agriculture: <http://www.sciencedaily.com/releases/2012/04/120425140114.htm>

The ethics of genetically modified (GM) foods are often debated. The opponents of GMs are concerned, for example, about the terminator gene that prevents plants from producing fertile seeds. Farmers would not be able to save seeds to plant next year, but would instead have to purchase new seeds annually. What does this mean for farmers in developing countries? The proponents of GMs offer a different picture and may, for example, promote the ability to create a durable plant that could survive in extended periods of drought and/or increased temperatures and therefore help to feed our children, even in light of climate change. What do your students think?

The World Health Organization presents 20 questions and answers on GMs at <http://www.who.int/foodsafety/publications/biotech/20questions/en/>.

The Australian government has a biotechnology website that includes a timeline of significant events illustrating our current uses of GMs at <http://www.biotechnologyonline.gov.au/foodag/timeline.html>.



YOUTH TAKE ACTION

Challenge for Change!

Distribute Student Handout #4: Youth Take Action (page 43) and discuss the inspirational profiles. Instruct students (groups, pairs or individuals) to select ONE student project listed under the Challenge for Change Action, or invite them to create their own challenge. Set appropriate timelines and criteria. Evaluate each project using Appendix C: Culminating Task Rubric on page 137.

BACKGROUND FOOD SECURITY

What is the Issue?

Children in poor countries are the most vulnerable to climate change since they do not have the ability to anticipate and adapt to the effects of climate change.⁹

The effects of climate change such as changes in water cycles and temperature increases are interconnected with food security. For example:

- Increasing drought and flooding are having a devastating effect on agriculture and the growing of food
- In arid and semi-arid areas, decline in rainfall is accelerating land degradation and desertification
- In tropical areas, small increases in temperature lead to declining crop yields¹⁰

The impact of climate change depends on the following:

- Hazard: defined as the physical effects of climate change like drought, flood and storms
- Vulnerability: defined as a country's ability to deal with these hazards

Some statistics:

- By 2080, as a result of climate change, developing countries in Asia, Africa and Latin America are expected to see reductions in agricultural productivity of between 5% and 25%, adding to the malnutrition of the world's children¹¹
- The International Rice Research Institute has found that rice yields fall by 15% with every degree of warming; if temperatures stay above 35°C for one hour while rice is flowering, this heat will sterilize the pollen¹²
- In addition, rising ozone levels (contributing to climate change) in rich nations are causing reductions in food production; the expected ozone increase in China will cause maize, rice and soybean production to fall by over 30% by 2020¹³
- As carbon dioxide levels rise, less water is released from the leaves of trees and from crops, resulting in less rainfall; this further exacerbates the crop production decline due to water stress

In summary:

As crops decline due to water constraints, rising temperatures and other natural disasters triggered by climate change, the following could occur:

- The availability of food for the farming household, as well as what is available for market, will decrease
- Livestock will be affected resulting in a decrease of meat and dairy products, as well as a decrease in the use of animals in small-scale agriculture, ploughing and transporting goods to market¹⁴

These will affect the ability of parents to feed themselves and their children.



The Effects of Malnutrition on Children

The consequences appear to be lasting and often permanent. For example, lack of nutritional food could result in

- Loss in growth
- Lower cognitive function
- Stunting
- Premature death¹⁵

To learn more about climate change connected to food security, view the UNICEF UK Climate Change Report 2008: Our climate, our children, our responsibility at <http://www.unicef.org.uk/campaigns/publications/pdf/climate-change.pdf>.

NOTES

1. UNICEF UK, Our climate, our children, our responsibility, p. 14.
2. David Suzuki Foundation, Science: Forests and Sinks, http://www.davidsuzuki.org/Climate_Change/science/Forests_and_sinks.asp (accessed November 2009).
3. Suzuki, David and David R. Boyd, David Suzuki's Green Guide (Toronto: Douglas & McIntyre, 2008), p. 46.
4. UN News Centre, "Climate Change Leading to Shrinking Fish Stocks, UN says," <http://www.un.org/apps/news/story.asp?newsid=25716&Cr=fish&Cr1> (accessed November 2008).
5. Ibid.
6. Rees, William and Mathis Wackernagel, Our Ecological Footprint: Reducing Human Impact on the Earth (Gabriola Island, BC: New Society Publishers, 1998), p. 9.
7. Suzuki, D. and D.R. Boyd, David Suzuki's Green Guide, p. 46.
8. Ibid., 62.
9. UNICEF UK, Our climate, our children, our responsibility, p.4.
10. Ibid.
11. Ibid., p. 9.
12. Monbiot, George, Heat: How to Stop the Planet From Burning (Cambridge: Southend Press, 2006), p. 7.
13. Ibid.
14. UNICEF UK, Our climate, our children, our responsibility, p. 14.
15. Ibid.

Student Handout #4

YOUTH TAKE ACTION

Challenge for Change Action Items

Be part of the solution! Complete ONE project from the list below or create your own! You will be evaluated on criteria including knowledge of the issue, expression of ideas and connections made between personal, local and global views of the issue.

Research what the Tesco grocery chain, in the UK, is doing now to assist consumers in buying locally produced food. Part of their plan included developing a carbon calorie counter to allow shoppers to calculate the carbon footprint of their weekly shop. They chose to end their carbon labeling program. Why?

PROJECT: Approach a local grocer to survey its policy on food choices related to climate change. Look at the origins of the produce and devise a plan the store can use to make change. For example, are the apples local, or travelling across the globe? What are local choices for produce? Are customers willing to pay extra for local produce? On the Internet, search “carbon footprint label” for more information.

Learn more about the 100 Mile Diet at <http://100milediet.org/>. What are the benefits? What are the challenges? How has this concept evolved over the years?

PROJECT: Create a YouTube clip, power point presentation or a song/jingle/Public Service Announcement (PSA) to promote a diet that is local, organic and plant-based. Include the global environmental benefits of this diet. How can eating a local diet help children in developing countries?

Research how different high nutritional foods (like UNICEF’s Plumpy’Nut) are helping developing countries feed severely undernourished children.

PROJECT: Host a fundraiser at your school to help UNICEF support the global food crisis. Which organizations do you think are doing the most to tackle this issue?

Food production, from seed to table, has changed drastically over the last 50 years. What are the environmental impacts of these changes? How is food production connected to climate change and children?

PROJECT: Interview older relatives and neighbours on their experiences with food in the past. How was it different from today? Why do they believe things have changed? Students can present an oral presentation or a written report.

New Westminster Secondary School, New Westminster, British Columbia

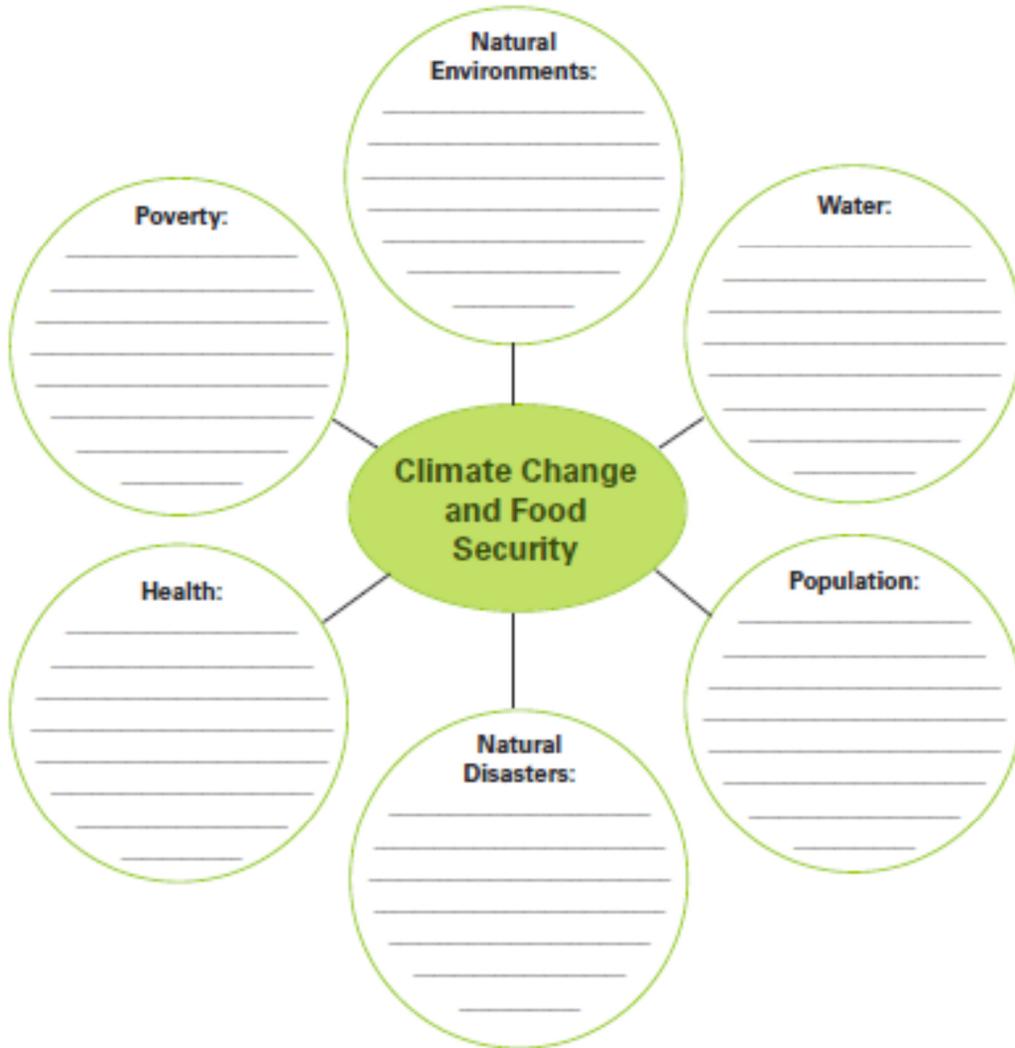
According to Wayne Esaias, a NASA scientist, the seasonal cycle of weight fluctuations in a beehive colony is an indicator of the impact of climate change. To create awareness of bee colony collapse disorder, students at New Westminster designed a presentation highlighting the issues. They also encouraged peers to “adopt-a-bee” and purchase beeswax candles, which supports their own apiary as well as the construction of apiaries in developing countries. For more information see <http://www.bcgreengames.ca>.

Addis Ababa, Ethiopia

To address future disruptions with food supplies caused by climate change, it is important to ensure the supply of nutritional foods for children all over the world. Plumpy’nut is a high-protein and high-energy, peanut-based paste, and is used for the treatment of severely undernourished children in many developing countries. As climate change affects world food supplies, this paste saves lives by providing much needed nutrition for children. For more information see <http://www.unicef.org>.

Student Handout #5

CIRCLES



Student Handout #6

FOOD FACTS CARDS: MEAT, EGGS, AND DAIRY

According to the David Suzuki Foundation, the average North American diet makes our food footprint four times greater than what we can sustain. A simple step to reduce your ecological footprint in terms of food is to eat a diet of local, organic plant-based foods. This could reduce your environmental impact by as much as 90%!

Here are some reasons to limit the meat, eggs, and dairy in your diet:

- Food from livestock is the most environmentally damaging food
- Raising and transporting livestock uses more fossil fuels than growing plant-based foods
- Producing animal protein requires 10 times the energy needed to produce plant protein
- Producing animal protein emits 10 times the greenhouse gas as plant protein
- Raising a kilogram of beef generates the same greenhouse gas emissions as driving an average car for 250 km
- There are several plant sources of protein (nuts, seeds, legumes, grains, etc.) so eating meat to obtain protein is not always a necessity

Adapted from David Suzuki's Green Guide, 2008.

Discuss and Record Responses for:

1. Explain how eating little or no meat, eggs and dairy will help significantly reduce your ecological footprint and create less greenhouse gas emissions
2. Give examples of how you can be successful in reducing the meat, eggs and dairy in your diet
3. How eating a plant-based diet could help children in developing countries with their food security? Think about this answer in terms of climate change. If we eat a diet rich in meat, eggs and dairy, how can it affect children in developing countries?
4. Design a meal that is local, organic and plant-based

Student Handout #7

FOOD FACTS CARDS: GOING ORGANIC!

According to the David Suzuki Foundation, the average North American diet makes our food footprint four times greater than what we can sustain. A simple step to reduce your ecological footprint in terms of food is to eat a diet of local, organic plant-based foods. This could reduce your environmental impact by as much as 90%!

Here are some reasons to include organic foods in your diet:

- Organic food production includes traditional farming practices with modern technology but does so without the use of synthetic pesticides and fertilizers
- Organic agriculture avoids the use of genetically modified (GM) foods
- Farmers who grow organic crops focus on improving the soil and using nature's way to control pests
- Organic farms know the importance of biodiversity and grow different plants
- Food sold in Canada can only use the word "organic" if it is certified by an accredited organization
- In the 1960s, 1 % of US corn was treated with pesticides, whereas today it is 95%
- Organic ways of growing our food can lower greenhouse gas emissions, create better soil, and save energy

Adapted from David Suzuki's Green Guide, 2008.

Discuss and Record Responses for:

1. Explain how eating organic foods can help significantly reduce your ecological footprint and create less greenhouse gas emissions
2. Give examples of how you can be successful in eating organic foods. Where can you get them? What is available on the market?
3. How could you eating an organic, plant-based diet help children in developing countries with their food security? Think about this answer in terms of climate change. If we eat a diet that is not organic, how can it affect children in developing countries?
4. Design a meal that is local, organic and plant-based

Student Handout #8

FOOD FACTS CARDS: LOCAL FOODS

According to David Suzuki, the average North American diet makes our food footprint four times greater than what we can sustain. A simple step to reduce your ecological footprint in terms of food is to eat a diet of local, organic plant-based foods. This could reduce your environmental impact by as much as 90%!

Here are some reasons to eat local foods in your diet:

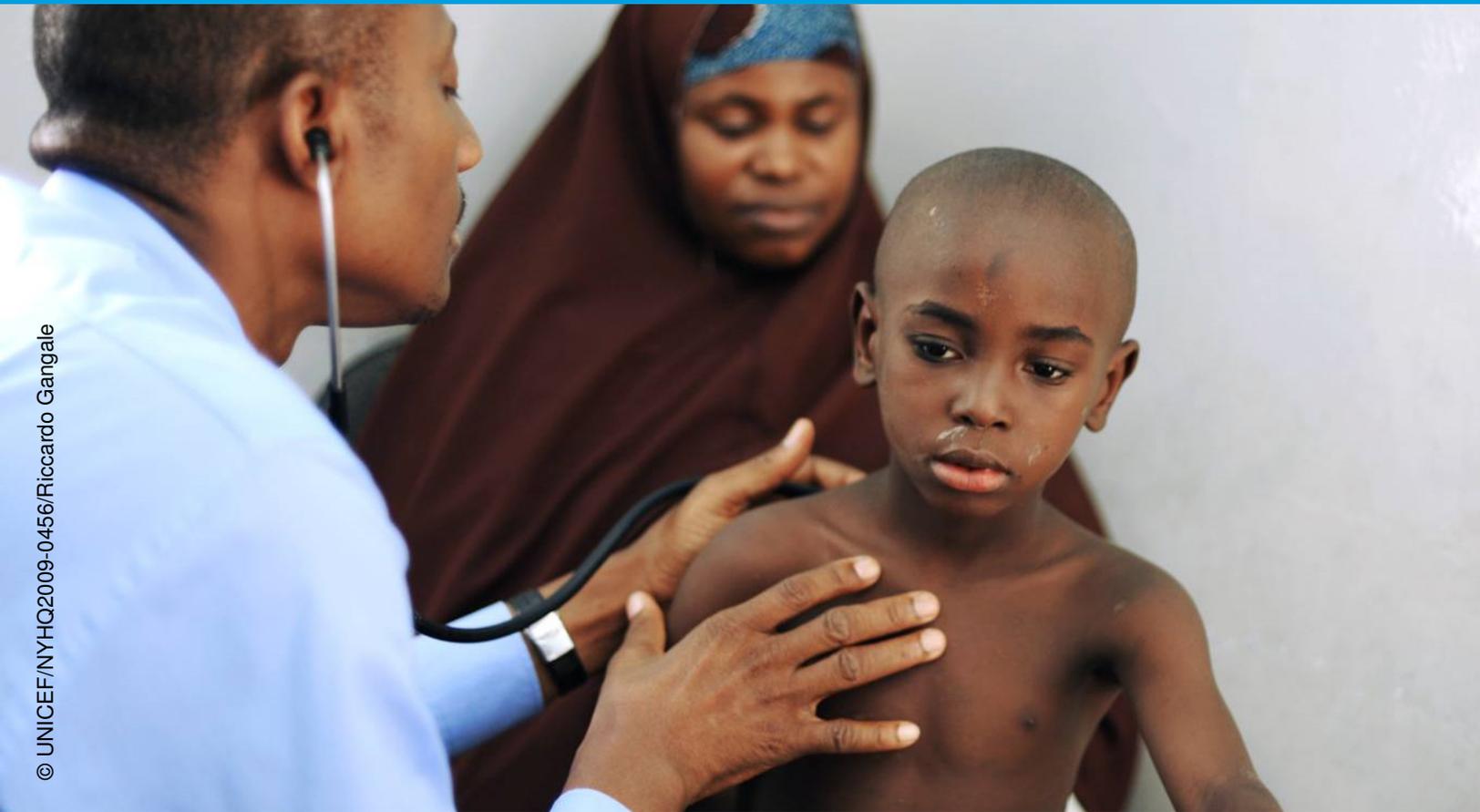
- Fish caught in British Columbia could be shipped to China for processing into fish sticks and then shipped back to Canada to be sold in local grocery stores
- Foods purchased that are not local could travel up to 33 times the distance as food that is local
- Canada continues to get much of our food from China, even with the increase of energy costs to transport the foods
- By eating local foods, local farmers are supported and therefore the agricultural sector in Canada is stimulated
- Local foods produce significantly lower greenhouse gas emissions as compared to food that travels great distances
- A good way to eat local is to grow your own food and/or visit a local farmer's market or check out what is available in local grocery stores

Adapted from David Suzuki's Green Guide, 2008.

Discuss and Record Responses for:

1. Explain how eating local foods can help significantly reduce your ecological footprint and create less greenhouse gas emissions
2. Give examples of how you can be successful in eating local foods. What is available on the market?
3. How could you eating a local, plant-based diet help children in developing countries with their food security? Think about this answer in terms of climate change
4. Design a meal that is local, organic and plant-based

HEALTH



© UNICEF/NYHQ2009-0456/Riccardo Gangale

Nigeria 2009

Dr. Yusuf Robbinson, a physician at Specialist Hospital in the town of Bauchi, uses a stethoscope to examine Usman Abubakar, 7. Usman is suspected of having malaria. A clinical diagnosis, including pathology to identify the parasite that causes malaria, is needed to confirm his illness.

INTRODUCTION

Our health means life. All children have the right to nutritional food and clean water, access to medical help and a clean and safe environment.¹ The effects of climate change, such as shortages of food and clean water, polluted air and temperature increases, are affecting the health of children, particularly those who are most vulnerable in developing countries.

The effects of climate change also affect the health of our children in developed countries. For example, climate change is fueling the spread of West Nile virus. Mosquitoes and ticks are surviving due to warmer winters and expanding their range, bringing health threats to developed countries.

However the good news is we can envision a world where children and adults can be healthy; we can start by understanding the issues and adopting the solutions.

ACTIVITIES

The curricula links below are addressed in this theme. For an extensive list of relevant provincial expectations/outcomes, refer to Appendices G and H: Curriculum Links on pages 142 and 146, and Appendix I for links in Alberta, Saskatchewan, Manitoba and Quebec.

Province	Course	Expectation/Learning Outcome
Ontario	SVN3M Environmental Science, Grade 1 , University/College <i>Human Health and the Environment</i>	C1. Analyze initiatives, both governmental and non-governmental, that are intended to reduce the impact of environmental factors on human health; C3. Demonstrate an understanding of various environmental factors that can affect human health, and explain how the impact of these factors can be reduced.
Ontario	HF4AM Grade 12 Social Sciences and the Humanities <i>Food and Nutrition Sciences</i>	Personal and social Responsibilities determine the relationship among nutrition, lifestyle, health, and disease.
British Columbia	Geography 12 <i>Weather and Climate</i>	Analyze interactions between human activity and the atmosphere, with reference to: <ul style="list-style-type: none"> • Global climate change • Ozone depletion • Acid precipitation
British Columbia	Socials 11 <i>Human Geography</i>	Assess environmental challenges facing Canadians, including: <ul style="list-style-type: none"> • Global warming • Ozone layer depletion • Fresh water quality and supply.

Setting the Stage

Objective: To define health as it relates to climate change

Time: 15 minutes

Materials

- Reused paper for each student (personal white boards or laptops)
- Appendix E: Reflect and Act (page 139)

Some students may have difficulty accessing YouTube clips while at school, so we have provided many of them directly on the UNICEF Teacher website at <http://www.unicef.ca/en/teachers/article/climate-change-and-children%E2%80%99s-rights>

ACTIVITY

1. Explain that you will be discussing health and how climate change can magnify the health concerns already facing children in developing countries.
2. Distribute Appendix E: Reflect and Act on page 139 to each student and ask them to journal lessons learned during discussion and activities around the theme.
3. Try a Think-Pair-Share activity. Ask pairs of students to draft a definition of what 'health' means. Next, join students in larger groups to discuss.
4. Share the World Health Organization's definition of health, which is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."² Discuss how this definition compares to the students' definitions.

Healthy Planet

Objective: To understand health concerns that children in developing countries are facing. Learn how some health concerns are made worse by the effects of climate change.

Time: 20 minutes

Materials

- Reused paper for each student (personal white boards or laptops)
- Student Handouts #10, 11: Information Sheets on Meningitis Belt and Cholera Outbreak

ACTIVITY

1. Arrange students into six groups.
2. Ask each group to record one or two examples of Canadian health issues (heart disease, cancer, cost of health care, etc.).
3. Next, distribute a copy of Student Handouts #10, 11: Information Sheets on Meningitis Belt and Cholera Outbreak (pages 56 and 57) instruct the groups to discuss the information. Ask students to record answers to the questions found on the bottom of each.
4. Ask students to share their findings. If Internet access is available, suggest students research the concept that the effects of climate change will lead to the emergence of new disease. For example, zoonoses (diseases in animals) often mutate due to changes in the environment. How can this mutation affect us?

Every 30 Seconds

Objective: To learn about malaria, how climate change can affect the spread of malaria, and what we can do to protect children who are at risk of contracting malaria.

Time: 35 minutes (or longer, depending on clips)

Materials

- Reused paper for each student (personal white boards or laptops)
- Student Handout #12: Malaria Numbers
- You Tube clips and media set up:
<http://www.youtube.com/watch?v=IVbq2yQH52g>

ACTIVITY

1. As a class, brainstorm possible health impacts on children that can be made worse by the effects of climate change. You may want to help by encouraging discussions on water supply (waterborne disease such as cholera) and climate-sensitive vector-borne (infections transmitted by the bite of infected arthropod species, such as mosquitoes) diseases such as malaria. For background information, refer to pages 53 and 54, Backgrounder — Health.
2. Ask students to share what they know about malaria. Possible answers may include how it is transmitted and what we can do to control the spread of it. Tell the students that malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected mosquitoes.
3. Distribute Student Handout #12: Malaria Numbers (page 58) to each group and instruct students to fill in a number they think best fits each blank space. You can distribute one handout per student, arrange them into six groups, or read out each question and instruct students to answer on scrap paper or individual white boards.
4. In groups or pairs, ask students to discuss why climate change could be a reason for the reintroduction of malaria in areas where malaria had been eradicated (mosquitoes need a warmer climate to survive). Ask groups to share with the class.
5. Play clips on malaria so students can understand the symptoms, prevention and cures of the disease. <https://www.youtube.com/watch?v=dGbgqe4soSQ> (Note: this clip is Part 1 of a series of helpful videos. Check them all out for more information about malaria).
6. Instruct the students to design a presentation or a public service announcement that will promote the sale of nets or raise awareness of the spread of malaria. They can either create a clip, poster or PowerPoint presentation. Encourage them to share these with students in the school. They can start by researching how international development organizations are currently working to stop the spread of malaria.

Keep the Discussion Going

How does malaria enter and infect the body? To what extent are children in developing countries at greater risk of being infected by malaria?

Malaria is preventable and curable. How can developing countries win the fight against malaria? What are real solutions?

With the introduction of globalization, is it easier or harder to fight the battle against malaria? Why? How is West Nile transmitted? What can be done to stop the spread of West Nile? How can the effects of climate change help spread West Nile?

West Nile is transmitted from a bite from a mosquito that has fed on the blood of an infected bird; malaria is transmitted from a bite from a mosquito that has fed on the blood of an infected person. The death toll for each is quite a different picture; 10 Canadians died of West Nile in 2003³ whereas close to 900,000 (mostly children) died of malaria in 2008.⁴



YOUTH TAKE ACTION

Challenge for Change!

Distribute Student Handout #9: Youth Take Action (page 55) and discuss the inspirational profiles. Instruct students (groups, pairs or individuals) to select ONE student project listed under the Challenge for Change Action or invite them to create their own challenge. Set appropriate timelines and criteria. Evaluate each project using Appendix C: Culminating Task Rubric (page 137).

BACKGROUNDER HEALTH

What is the issue?

The effects of climate change are affecting children's health. Children in the world's poorest communities are the most vulnerable.

The physical effects of climate change are:

- Drought
- Floods
- Storms
- Increase in temperature
- Changes in weather patterns
- Natural disasters.

Which result in:

- Food shortages
- Water shortages and contamination
- Heat waves
- Increase in disease (diarrhoea, malaria and respiratory issues)
- Natural disaster devastation

The effects of climate change directly impact the health of children in the following ways:

Impacts of malnutrition in children, due to food shortages are:

- High mortality rates
- Stunted growth
- Development leading to other health issues.

Impacts of water shortages resulting in children not having access to safe water but instead drinking water that contains waterborne diseases such as:

- Diarrhoea
- Cholera
- Typhoid.⁵

Impacts of contamination (particularly in urban areas) caused by an increase in rainfall and flooding:

- Increased sanitation issues
- Increasing waterborne diseases
- More people will move to urban areas as natural resources are depleted compounding this problem.⁶

Impacts of climate variability on vector-borne diseases:

- Malaria
- Dengue fever
- Yellow fever.



“Malaria is known to be influenced by factors such as rainfall, humidity, temperature and levels of surface water, all of which affect vector reproduction and lifespan.”⁷ These changes in environmental factors are resulting in malaria being reintroduced into areas where it has been eradicated. An example of this is in the highlands of Kenya. A new malaria case was reported after 50 years of no malaria cases. Dengue fever, and yellow fever, two other types of vector-borne diseases, are also likely to increase.⁸

Note: A vector-borne disease is one in which a disease is transmitted from one organism to another by an arthropod such as a mosquito.

Other impacts of climate change:

- Researchers in West Africa have recently documented a series of complex interactions between patterns of irrigation and malaria transmission, land degradation and meningitis, and deforestation and onchocerciasis (river blindness).⁹
- Drier climate conditions (hot, dry weather and dusty environments), affect the susceptibility of children to diseases such as meningitis.¹⁰ It is predicted that climate change will result in not only an increased occurrence of common illnesses in both developed and developing nations, but also the emergence of new diseases.
- There is also evidence that high ground level ozone may cause an increase in childhood asthma.
- Other climate-related increases in levels of other aeroallergens that trigger asthma are well documented such as pollen. Heat or cold stress due to climate change also can increase child deaths and exacerbate chronic conditions.¹¹
- Indoor air pollution caused by burning fossil fuels in cooking is leading to an increase in respiratory illness in children. Where there is not enough ventilation and smoky conditions exist, children are exposed to poor air quality for longer periods of time. As global energy demands bring an increase in the burning of fossil fuels, air quality will likely drop.

To learn more about climate change connected to health, view the UNICEF UK Climate Change Report 2008: *Our climate, our children, our responsibility* at

<http://www.unicef.org.uk/Latest/Publications/Climate-change-food-systems-and-children-a-case-for-greater-action/>

1. UNICEF UK, *Our climate, our children, our responsibility*, p. 12.
 2. World Health Organization, “Frequently Asked Questions,” <http://www.who.int/suggestions/faq/en/index.html> (accessed November 2009).
 3. Healthy Ontario, “West Nile Virus,” http://www.healthontario.com/Conditiondetails.aspx?disease_id=288 (accessed November 2009).
 4. World Health Organization, “Global Malarial Programme”, <http://apps.who.int/malaria/> (accessed November 2009).
 5. UNICEF UK, *Our climate, our children, our responsibility*, p. 10.
 6. *Ibid.*, p. 16.
 7. *Ibid.*, p. 15.
 8. *Ibid.*, p. 13.
 9. *Ibid.*, p. 14.
 10. *Ibid.*, p. 15.
 11. *Ibid.*, p. 16.

Student Handout #9

YOUTH TAKE ACTION

Challenge for Change action items

Be part of the solution! Complete ONE project from the list below or create your own! You will be evaluated on criteria including knowledge of the issue, expression of ideas and connections made between personal, local and global views of the issue.

Research waterborne diseases. Every year, waterborne diseases like diarrhoea, cholera and typhoid claim the lives of millions of children in the developing world.

PROJECT: Develop fact sheets on three waterborne diseases and include the statistics and facts of each. Research what UNICEF is doing to make a difference (e.g. rainwater harvesting) and learn how your school can get involved in the solution. Document this in your fact sheets. For more information on the Internet, search “UNICEF global rain water harvesting.”

Luanda, Angola

The First-ever Global Handwashing Day was celebrated on October 15, 2008. Students and teachers from more than 700 schools across Angola sang songs, learned the facts and washed their hands. Using water and soap is a simple act that can save lives. As the physical effects of climate change (drought, floods, storms and increase in temperatures) cause water shortages and contamination, an increase in diseases such as diarrhoea and cholera will follow. Washing hands helps stop the spread of these diseases. For more information see <http://www.unicef.org.uk/UNICEFs-Work/What-we-do/Issues-we-work-on/Climate-change/>.

Research your municipality’s plan to prevent mosquitoes from breeding and spreading West Nile. As mosquitoes breed in stagnant water, it is important to empty containers where water collects. On a municipal level, Metro Vancouver is working to stop mosquitoes before they start breeding, by applying larvicide to control mosquitoes in breeding areas, catch basins and surface water.

PROJECT: Create a You Tube clip, PowerPoint presentation or a song/jingle/PSA to promote actions that help control the breeding of mosquitoes. Include facts about the spread of West Nile and actions that work. For more information on the Internet, search “Metro Vancouver West Nile.”

Student Handout #10

Information Sheet 1

UNICEF AND PARTNERS PREPARE FOR MENINGITIS OUTBREAKS

The Global Alliance for Vaccines and Immunisation (GAVI) gave UNICEF and the World Health Organization over \$50 million to purchase meningococcal vaccines and pay for reactive campaigns in the highly endemic African “meningitis belt” countries. The goal is to save lives and contain the spread of meningitis, a highly contagious disease.¹

Four hundred million people currently are at risk of contracting this meningococcal disease. “The highest burden of meningococcal disease occurs in a swathe of sub-Saharan Africa known as the “meningitis belt”, which stretches from Senegal in the west to Ethiopia in the east and where epidemics occur every year. During the dry season, between January and June, many factors, including social and climate habits, increase the risk of meningitis. Each year, the disease takes a heavy economic and human toll.”²

According to the World Health Organization, “Meningitis is an infection of the meninges, the thin lining that surrounds the brain and the spinal cord. Several different bacteria can cause meningitis and *Neisseria meningitidis* is one of the most important because of its potential to cause epidemics.”³

The bacteria are transmitted from person to person through droplets of respiratory or throat secretions. Close and prolonged contact (e.g. kissing, sneezing and coughing on someone, living in close quarters or dormitories (military recruits, students), sharing eating or drinking utensils, etc.) facilitates the spread of the disease. The most common symptoms are stiff neck, high fever, sensitivity to light, confusion, headaches and vomiting. Even when the disease is diagnosed early and adequate therapy instituted, 5% to 10% of patients die, typically within 24-48 hours of the onset of symptoms.”⁴

Meningitis outbreaks may be seen in drier, hotter areas. The physical effects of climate change such as drought and increase in temperature appear to be the reason why there have been meningitis outbreaks in the African Sahel region’s “meningitis belt”. Children are most at risk.⁵

Discuss and Record

1. How does this case study differ from your examples of Canadian health issues?
2. What are some facts about meningitis?
3. List reasons on how climate change can worsen this picture of a meningitis outbreak.
4. What actions can you take locally to make a difference globally?



UNICEF has provided thousands of doses of measles, polio and meningitis vaccines to protect young children and their families from preventable diseases in the crowded environment of Maltam Camp in northern Cameroon.

NOTES

1. UNICEF Press Centre, “UNICEF and Partners Mobilise to Counter Meningitis Outbreaks,” http://www.unicef.org/media/media_49254.html (accessed November 2009).
2. Ibid.
3. World Health Organization, “Meningococcal Meningitis,” <http://www.who.int/mediacentre/factsheets/fs141/en/> (accessed November 2009).
4. Ibid.
5. UNICEF UK, Our climate, our children, our responsibility, p. 15.

Student Handout #11

Information Sheet 2 CHOLERA OUTBREAK IN SOUTHERN AFRICA

Thousands of cases of cholera, a waterborne disease, have been reported in Southern Africa. In Zimbabwe, for example, early in March 2009 close to 90,000 suspected cases of cholera resulting in 3,975 deaths had been reported to the World Health Organization, according to a UNICEF article.

“Cholera is spread through contaminated water supplies and is highly communicable. Many of the areas with the highest rates of infection are in areas bordering Zimbabwe, where political unrest, economic collapse and a ravaged health-care system have combined to fuel the epidemic.”¹

According to the World Health Organization, “Cholera is an acute diarrhoeal infection caused by ingestion of the bacterium *Vibrio cholerae*. Transmission occurs through direct faecal-oral contamination or through ingestion of contaminated water and food. The extremely short incubation period — two hours to five days — enhances the potentially explosive pattern of outbreaks, as the number of cases can rise very quickly. Cholera is an extremely virulent disease that affects both children and adults. Individuals with lower immunity, such as malnourished children or people living with HIV, are at greater risk of death if infected by cholera.”²

Cholera is primarily transmitted through contaminated water and food. There is a correlation between contaminated water and inadequate living conditions. “The absence or shortage of safe water and sufficient sanitation combined with a generally poor environmental status are the main causes of spread of the disease.”³

The physical effects of climate change such as drought, floods, storms, increase in temperature and changes in weather patterns cause a multitude of outcomes, including water shortages and contamination. The result is a rise in diseases such as cholera. All directly impact the overall health of the population; young people in the world’s poorest communities are the most vulnerable.

Discuss and Record

1. How does this case study differ from your examples of Canadian health issues?
2. What are some facts about cholera? Name three reasons why the average Canadian is not at risk for cholera.
3. List reasons how climate change can worsen this picture of a cholera outbreak.
4. What actions can you take locally to make a difference globally?



A girl rests beside an elderly woman on a bench as they wait to be treated for cholera, at a UNICEF-assisted clinic in Musengezi village, Zimbabwe.

NOTES

1. UNICEF, “Cholera Outbreaks Raise Concern in Nine Southern African Countries,” http://www.unicef.org/health/index_48553.html (accessed November 2009).
2. World Health Organization, “Cholera,” <http://www.who.int/mediacentre/factsheets/fs107/en/index.html> (accessed November 2009).
3. Ibid.

Student Handout #12

MALARIA NUMBERS

Using only eight numbers from the list below, fill in the blanks to complete the story of malaria. No number should be repeated.



A woman unfurls an insecticide-treated mosquito net over a child's bed in Papua New Guinea. UNICEF supplies bed nets as part of a community-based program that helps families implement sound maternal and early childhood development practices, including the use of insecticide-treated mosquito nets.

Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected mosquitoes. A child dies of malaria every ____ seconds. There were ____ million cases of malaria in 2006, causing about ____ deaths, mostly among African children.

Malaria is ____ of the most climate-sensitive vector-borne diseases. In recent years, the number of epidemics of malaria has increased across East Africa. Previous highland malaria epidemics were not as severe or as frequent as they have been over the past two decades. For instance, from the 19____s to the early 19____s, there were virtually no recorded malaria epidemics in the East African highlands.

Approximately ____ % of the world's population is at risk of malaria, particularly those living in lower-income countries. A study in Kenya shows that the use of bed nets results in a ____ % drop in the number of child deaths. Malaria is curable and preventable!

Possible answers:

- 40 880,000 44 30 100 100,000 247 50 80 2,000 60 1 12 14

Student Handout #13

MALARIA NUMBERS ANSWER KEY

Using only eight numbers from the list below, fill in the blanks to complete the story of malaria. No number should be repeated.



A woman unfurls an insecticide-treated mosquito net over a child's bed in Papua New Guinea. UNICEF supplies bed nets as part of a community-based program that helps families implement sound maternal and early childhood development practices, including the use of insecticide-treated mosquito nets.

Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected mosquitoes. A child dies of malaria every ____ **(30)** seconds. There were ____ **(247)** million cases of malaria in 2006, causing about ____ **(880,000)** deaths, mostly among African children.

Malaria is ____ **(one)** of the most climate-sensitive vector-borne diseases. In recent years, the number of epidemics of malaria has increased across East Africa. Previous highland malaria epidemics were not as severe or as frequent as they have been over the past two decades. For instance, from the 19 ____ **(60)**s to the early 19 ____ **(80)**s, there were virtually no recorded malaria epidemics in the East African highlands.

Approximately ____ % **(50)** of the world's population is at risk of malaria, particularly those living in lower-income countries. A study in Kenya shows that the use of bed nets results in a ____ % **(44)** drop in the number of child deaths. Malaria is curable and preventable!

NATURAL DISASTERS



Pakistan, 2008

On 1 November, Sulima Paten, holding her two-year-old son, Mohammed, stands outside their destroyed home in Kili Mirgha Kawas Village in Ziarat District, one of the worst-affected areas, in Balochistan Province. UNICEF is assessing needs in the earthquake-ravaged community, located in a very sparsely populated area. On 5 November 2008 in Pakistan, relief efforts continue on behalf of children and families in the aftermath of a 6.4-magnitude earthquake that hit the remote south-western province of Balochistan on 29 October.

INTRODUCTION

Natural disasters are increasing in severity and frequency; we are becoming more aware that climate change is contributing to this growth. Children have the right to be raised in a safe environment and so it is our responsibility to ensure children obtain this right, as stated in Article 24 of the UN Convention on the Rights of the Child.¹ Many organizations worldwide are taking action to equip communities with knowledge and skills to prepare for emergency disasters rather than simply responding after the disaster has taken place. This is essential to protect the lives of children, particularly those most vulnerable in developing countries.

Here in Canada, youth need to be aware of natural disasters that could affect our communities as a result of climate change. We need to equip youth to not only have compassion and take action in developing countries, but also to be prepared for issues facing us locally.

The **good news** is that we **can** learn from the innovative and practical actions underway to address the negative effects of climate change and participate in preparing to lessen the effects of natural disasters. We can start by understanding the issues and then doing our part to make a difference.

ACTIVITIES

The curricula links below are addressed in this theme. For an extensive list of relevant provincial expectations/outcomes, refer to Appendices G and H: Curriculum Links on pages 142 and 146, and Appendix I for links in Alberta, Saskatchewan, Manitoba and Quebec.

Province	Course	Expectation/Learning Outcome
Ontario	HPW3C Grade 1 Social Sciences and the Humanities: Living and Working with Children	Socialization of Children Evaluate various global influences on children and families
Ontario	SNC2P Science, Grade 10 Applied <i>Earth and Space Science</i>	D1. Analyze effects of human activity on climate change, and effects of climate change on living things and natural systems.
British Columbia	Socials 11	Assess environmental challenges facing Canadians, including <ul style="list-style-type: none"> • Ozone layer depletion • Fresh water quality and supply
British Columbia	Civics 11 <i>Civic Deliberation</i>	Analyze the domestic and international effects of Canada's record with respect to issues and events in one or more of the following categories: <ul style="list-style-type: none"> • Environment • Trade • Foreign aid • Peace and security • Human rights

Setting the Stage

Objective: To define natural disasters as they relate to climate change

Time: 10 minutes

Materials

- Reused paper for each student (personal white boards or laptops)
- Appendix E: Reflect and Act (page 139)
- Movie clip: *2 Lives: 2 Miles //Disaster*
http://www.youtube.com/watch?v=5u5Hy8Q3nZ0&list=PLD6AA4215618717BB&index=8&feature=plpp_video

ACTIVITY

1. Explain that you will be discussing natural disasters connected to climate change; climate change results in an increase in (and severity of) global natural disasters. Natural disasters can strike at any time and children are affected the greatest by the aftermath of a disaster.
2. View the movie clip: *2 Lives: 2 Miles.// Disaster*. Distribute to each the Appendix E: Reflect and Act on page 139 and ask students to journal lessons learned during the movie clip, class discussion and activities around the theme.
3. Have students review the site, Children in a Changing Climate at <http://www.childreninachangingclimate.org/home.htm>, which contains reports (ex. Children on the Frontline: Children and Young People in Disaster Risk Reduction) outlining the importance of ensuring that children have a voice when tackling climate change and disaster risk reduction in their communities.
4. Ask students to draft personal definitions of what a “natural disaster” means. Ask students to list examples of natural disasters. Have students share their responses.
5. Share that natural disasters are disasters caused by natural forces. Examples of natural disasters include floods, storms, droughts, cyclones and landslides. Today, millions of children from all over the world suffer from the effects of natural disasters; it is predicted that storms, floods and droughts will become more severe, because of climate change.²
6. Ask students, “What do you feel about the fact that children are usually the most negatively affected by natural disasters?”

When Disaster Strikes

Objective: To list basic human needs and how they are met after natural disasters that increasingly occur because of changing climatic patterns.

Time: 25 minutes plus time for research project

Materials

- Reused paper for each student (personal white boards or laptops)

ACTIVITY

1. Discuss natural disasters and brainstorm examples: floods, earthquakes, storms, fires, landslides, tsunamis, etc.
2. Share the details of a natural disaster that caused massive devastation, such as Hurricane Katrina, the tsunami in Thailand, etc. Instruct students to research one recent natural disaster (as homework or during class time). In their report, students should give details on the type of natural disaster, where and when it took place, what toll it took on the local people and environment, and what assistance the community received. This report can be presented on a poster board or as an oral presentation.
3. Explain that inevitably it is the poor who are most vulnerable to a natural disaster in developing

countries, “as their livelihoods are often dependent on land, crops or livestock. They are also more likely to live in high-risk locations such as flood plains, river banks, steep slopes, on reclaimed land, and in densely populated slums of poorly constructed houses.”³

4. Ask students to list basic human needs that might not be met after a natural disaster. Examples may include food, clean water, shelter, first aid, etc. Discuss which of these needs are matters of survival. How can the inability to obtain these essentials impact the welfare of the children?
5. Debate Article 24 of the UN Convention on the Rights of the Child (CRC) 0 the most widely ratified human rights treaty and the foundation for UNICEF’s work with and for children. Article 24 states that it is the responsibility of developed nations to help developing nations. Why (or why not) should we help? How can we help?
6. Next, ask students to research how the aftermath of a natural disaster in Canada may differ from one in a developing country. How are Canadians prepared for a natural disaster? What role does the Canadian government play?

An earthquake of magnitude 9.0 unleashed tsunami waves up to 10 metres high across South Asia and East Africa as people slept one early morning in December 2004; this natural disaster was responsible for killing tens of thousands of people. For more information see http://www.unicef.org/media/media_24628.html.

A category 4 cyclone struck the southern coast of Bangladesh in November of 2007 resulting in torrential rains and strong winds. Over 3 million people were affected by the intense storm; children among the hardest hit. For more information see http://www.unicef.org/infobycountry/bangladesh_41830.html.

Be Prepared

Objective: To develop a list of basic survival items needed in the event of a natural disaster and help students discover why developing countries are at greater risk of a natural disaster.

Time: 45 minutes

Materials:

- Student Handout #15: Emergency List
- Slide show on Cyclone Nargis aftermath and media set-up (<http://www.unicef.org/thailand/8243.html>)
- Student Handout #16: A Picture says a Thousand Words

ACTIVITY

1. Arrange the class into six groups.
2. Distribute Student Handout #15: Emergency List (page 70) and discuss the items that could comprise a disaster emergency kit.
3. Instruct groups to choose, and come to a consensus on, an emergency list containing only 10 items from this list.
4. Compare the lists in the class. Have groups defend their choices.

5. Ask students to compare luxury items versus survival items. What items in their emergency kit could change for people in different parts of the world? After a natural disaster, humans have basic needs; are those basic needs different in Canada than in other countries like India or Malawi?
6. Discuss the Myanmar (Burma) Cyclone Nargis emergency, which devastated that region in May 2008. Cyclone Nargis was a deadly tropical storm. Myanmar is located just northwest of Thailand.
7. Show the slide photo essay on the Myanmar Cyclone Nargis aftermath at <http://www.unicef.org/thailand/8243.html>. Distribute and ask students to complete Student Handout #16: Pictures say a Thousand Words (page 71).

Being Heard: Youth Speak Out

Objective: To understand the importance of youth participation on issues of climate change and natural disasters.

Time:

- Part A: 75 minutes
- Part B: Three 75 minute sessions

Materials:

- *Agents of Change* blog and video clip found at: www.unicef.ca/en/blog/agents-of-change
- Student journals
- Video recording equipment or camera
- Flip chart for additional note taking
- Computers and software for video editing

ACTIVITY

Part A

1. Have students read the article and watch the “Sea Change” video found on the *Agents of Change* blog (www.unicef.ca/en/blog/agents-of-change)
2. Have students take two to five minutes to reflect on how the video impacted them. Is this video different from others about natural disasters that they have seen? Why or why not? Ask students to note their impressions in their journals using one or two words.
3. Arrange the class into groups of three and ask students to share some or all of what they wrote with their group. Between them, students are to choose three key words that might describe their reaction/feeling about the video and write those on the board.
4. As a class, identify major themes from the words listed on the board (e.g., empowerment, climate change, youth, impacts, etc.).
5. In the groups of three, create lists under the following categories: IMPACTS OF CLIMATE CHANGE/NATURAL DISASTERS ON YOUTH (NORTH/SOUTH DIFFERENTIATION), WHAT IS

BEING DONE TO MITIGATE THESE IMPACTS, and WHAT CAN YOUTH DO. (An editable Google document could be used that groups can add to and comment on).

6. As a class, come up with a Youth and Climate Change Declaration and publish it on the school website.

Part B

1. In groups of five or six, have students come up with questions about climate change to ask students in other classes. These questions can be based on the “Sea Change” video and the discussions and the themes that emerged from the previous class. Their questions should be approved by their teacher and principal prior to carrying out the project.
2. Have groups interview and video record other students. Each group member should have a contribution that is clearly defined (e.g., recording the responses, asking for recording permission, asking the questions, etc.).
3. In a computer lab or on a projector, lead a demonstration on how to edit videos.
4. From the footage or audio tracks that they have recorded, have each group edit the content down to a maximum of five minutes.
5. View the videos in the final 30 minutes of the class.

Keep the discussion going

Are all humans given the same assistance after a natural disaster? Why or why not? What role does foreign policy play? What role do different countries play?

What role does the inequity of wealth play in managing a natural disaster?

What are some of the health issues that may develop after a disaster? How could we prepare for this?

As climate change is linked to the increase of natural disasters globally, how we choose to live can affect our global neighbours. What actions can you take to lessen your ecological footprint and therefore help stop climate change?

Yukon's Zelma Lake is losing water at a rapid rate. For more information see <http://www.cbc.ca/canada/north/story/2007/08/07/yk-zelma.html?ref=rss>.



YOUTH TAKE ACTION

Challenge for Change!

Distribute Student Handout #14: Youth Take Action (page 69) and discuss the inspirational profiles. Instruct students (groups, pairs or individuals) to select ONE student project listed under the Challenge for Change Action or invite them to create their own challenge. Set appropriate timelines and criteria. Evaluate each project using Appendix C: Culminating Task Rubric on page 137.

BACKGROUNDERS NATURAL DISASTERS

What is the issue?

There is increasing evidence of the changes in the climate system resulting in an increase in the frequency and severity of natural disasters. “Evidence that our climate is warming is now deemed ‘unequivocal’ by the Intergovernmental Panel on Climate Change (IPCC) based on global surface temperature records, revealing that eleven out of the last twelve years rank among the warmest since 1850.”⁴

The effects of climate change will result in the following:

- Droughts
- Floods
- Storms
- Temperature changes
- Weather pattern changes

What is happening around the world?

2006

- January: Russia and Eastern Europe experienced a coldwave, similarly in India and Bangladesh a coldwave claimed around 300 lives.
- Later in 2006, western and Central Europe experienced the hottest temperatures on record during July to October.
- Severe drought in 2006 affected millions of people across China, Afghanistan and Brazil.
- East Africa experienced the worst flooding in 50 years, with more than 600 lives lost in Ethiopia alone.

2007

- July: floods, Africa – 1.5 million people affected by extreme rainfall across 18 countries of West East and Central Africa.
- August: typhoon, Philippines, Taiwan and China – typhoon Sepat affected more than 1.53 million people in China alone.
- November: floods, Gulf of Mexico – Mexico experienced its worst floods in 50 years affecting more than 1 million people. Thousands of families were forced out of their homes by floodwaters and were in desperate need of water, food and medicine.
- November: cyclone, Bangladesh – Cyclone Sidr leaves a trail of destruction across 30 districts of Bangladesh, 7 million people affected, 600,000 children under the age of 5.

2008

- May: According to UN calculations China was the country with the largest natural disaster-related



economic impact in 2008. In May, China's Sichuan province was rocked by a 7.9 magnitude earthquake leaving 80,000 people dead and 18,000 missing.

- May: Cyclone Nargis left a path of destruction after it swept the Burmese peninsula with massive waves and winds that exceeded 190km/h. According to US estimates, Cyclone Nargis took the lives of over 100,000 people and left approximately 1 million homeless.
- September: Caribbean countries, Louisiana, and Texas were hit by the Hurricane Ike. The devastating effects of the category 4 hurricane left a path of devastation; the storm was directly responsible for 103 deaths, as well as rendering thousands homeless because of the extensive damage left in its wake.

2009

- February: On February 7th Victoria, Australia was faced with a series of bushfires that were subsequently dubbed the "Black Saturday" fires. The fires were sparked by a lethal mix of dry conditions, high temperatures, and extremely high winds. The Black Saturday fires killed 173 people and displaced 7,562 people.
- November: Hurricane Ida caused extensive damage on the east coast of Nicaragua and the adjacent islands. Flood waters and mudslides displaced approximately 6,000 people in El Salvador.
- April: A 6.3 magnitude earthquake affected a number of small villages in the mountainous region northeast of Rome, Italy. The earthquake damaged historical buildings, killed nearly 100 people, and left tens of thousands of people homeless.

2010

- January: A 7.0 magnitude earthquake struck the island nation of Haiti leaving 230,000 people dead.
- February: A snowstorm referred to as "Snowmagedon" blanketed the American northeast with record-breaking amounts of snow. Some areas received over 3 feet of snow over a two day period.
- July-August: Heavier than normal monsoon rains caused serious flooding in northwest Pakistan. Over one fifth of the country's total area was under water affecting over 17.2 million people.
- Volcanic eruptions from the Eyjafjallajokull volcano in Iceland produced an ash-plume so large that it disrupted trans-Atlantic air traffic periodically over a 5 week period.

2011

- March: An 8.9 magnitude earthquake rocked the Japanese coast triggering a tsunami that produced waves as high as 30 feet.
- Summer: Kenya, Somalia, Djibouti, Ethiopia, and Eritrea were affected by widespread drought sparking the most significant famine in decades.
- Beginning in July Thailand experienced the worst flooding the country had seen in 50 years. The floods affected over 12 million people.

2012

- March: Winter in Canada was unseasonably warm with multiple record-breaking high temperatures. As a result of the mild, dry winter, the Alberta government had to begin wildfire season a month earlier than usual.
- September: The Arctic sea ice reached its lowest recorded level.
- October: Superstorm Sandy wreaked havoc on parts of the Caribbean and the American East Coast. The storm left a path of destruction, destroying homes and business and claiming at least 125 lives.

As with the other impacts of climate change, developing and poor countries are most vulnerable to these natural disasters and climate change effects. They do not have the ability to respond and adapt to the disasters, having no resources and finances to invest in disaster preparedness. The developing countries have lower economic diversification, and generally are more reliant on agriculture, making them more vulnerable. Children are the most vulnerable as they may be killed or injured, suffer malnutrition, become orphans, or be separated from their families.⁵



Communities taking action

Actions plans are being created to equip communities with knowledge and skills to prepare for emergency disasters rather than just responding after the disaster has taken place.

- For example, in West Bengal, UNICEF, the state government, and other organizations have been working with communities to establish action plans. They have identified vulnerable people in their villages, such as the elderly, the sick, and young children. Some have learned to make rafts, and each family has learned to prepare a survival kit.⁶
- Small island developing nations are also a high vulnerability risk since a natural disaster may wipe out the entire nation, forcing displacement and permanent migration. Many nations, including Trinidad and Tobago, are developing risk-reduction and awareness initiatives that will empower communities to plan in advance and effectively address the issues that natural disasters bring to the forefront. Check out UNICEF's SIDS (Small Island Developing States) Fit for Children Network at <http://www.sidsnet.org/>

To learn more about climate change connected to natural disasters, view the UNICEF UK Climate Change Report 2008: Our climate, our children, our responsibility at <http://www.unicef.org.uk/campaigns/publications/pdf/climate-change.pdf>.

NOTES

1. UNICEF UK, Our climate, our children, our responsibility, p. 12.
2. Ibid., p. 26.
3. UNICEF, Climate Change, http://www.unicef.org.uk/campaigns/campaign_sub_pages.asp?page=95 (accessed November 2009.)
4. UNICEF UK, Our climate, our children, our responsibility, p. 4.
5. Ibid., p. 5.
6. Ibid., p. 27.

Student Handout #14

YOUTH TAKE ACTION

Challenge for Change action items

Be part of the solution! Complete ONE project from the list below or create your own! You will be evaluated on criteria including knowledge of the issue, expression of ideas and connections made between personal, local and global views of the issue.

Research and assess your preparedness in accordance with the Government of Canada's 72 Hour Plan; download the step-by-step guide on how to put together an emergency preparedness kit at home. Survey your peers to see who has put together an emergency preparedness kit at home or at school.

PROJECT: Create a YouTube clip, PowerPoint presentation or a song/jingle/PSA/rap/skit to encourage Canadians to be prepared for a natural disaster. Include a global connection to why Canadians should also help developing countries prepare for a natural disaster. Ensure you include information on Canada's 72 Hour Plan. You may want to display a sample emergency preparedness kit at school. For more information see <http://www.getprepared.gc.ca/index-eng.aspx>.

Learn about Arctic residents living along the coast of the Beaufort Sea who are worried about the effects of climate change as rising sea levels and melting permafrost could erode away communities. How can a plan of action help residents prepare for a natural disaster?

PROJECT: Contact a school in a Canadian Territory to interview students on their reactions to the melting permafrost. What changes have they seen over the past five years? What have the teachers noticed over the past 10 years? What local actions are being taken? What actions can we take to make a difference? For more information see <http://www.cbc.ca/canada/north/story/2009/01/12/permafrost.html>

Research the actions UNICEF is taking to offer relief in developing countries in times of natural disasters and document a recent UNICEF relief mission. What support did UNICEF offer? How can we become involved? Visit <http://www.educationandtransition.org/> to learn about UNICEF's international development work on education in emergencies and post-crisis transition countries.

PROJECT: Get involved in a recent relief effort by organizing a fundraiser to raise money (and awareness) for medical, food, and water supplies for regions hit with a natural disaster.

Go to <http://www.unicef.org/appeals/> and familiarize yourself with the current funding appeal of a specific humanitarian mission. Why do the children of that country need UNICEF's support? What activities is UNICEF using charitable donations to fund? How do they distribute funding?

Barrie North Collegiate, Barrie, Ontario

Students at Barrie North Collegiate became part of the solution when they tackled issues affecting developing countries: climate change, pollution, war and poverty. Student clubs organized clothing drives, book fairs and garbage-free lunch days. Students also raised funds for local charities and UNICEF.

Barrie North is a winner of Lakehead University's "Do Something" contest; schools were asked to demonstrate action around issues of climate change, the environment, and social, economic and political issues. For more information see <http://www.lakeheadu.ca>.

Bangkok, Thailand

In February 2005, Alicia Keys hosted MTV Asia Aid. Cheering fans watched their favourite stars perform as part of a benefit to assist the tsunami relief effort in Asia. Because children were especially hard hit by the natural disaster, UNICEF was the chief beneficiary of the concert. For more information see <http://www.unicef.org>.

Student Handout #15

EMERGENCY LIST

Check only the most important TEN items you would require after a natural disaster.

- | | | |
|---|--|---|
| <input type="checkbox"/> First aid kit | <input type="checkbox"/> Pillow | <input type="checkbox"/> Soap |
| <input type="checkbox"/> Cash | <input type="checkbox"/> Cell phone | <input type="checkbox"/> Garbage bags |
| <input type="checkbox"/> Gloves | <input type="checkbox"/> Tent | <input type="checkbox"/> Dried soup |
| <input type="checkbox"/> Portable radio | <input type="checkbox"/> Football | <input type="checkbox"/> Tinned food |
| <input type="checkbox"/> Coffee | <input type="checkbox"/> Towel | <input type="checkbox"/> Medicine |
| <input type="checkbox"/> Clean sheets | <input type="checkbox"/> Toilet paper | <input type="checkbox"/> Camping cook set |
| <input type="checkbox"/> Doll | <input type="checkbox"/> Whistle | <input type="checkbox"/> Survival blanket |
| <input type="checkbox"/> Bucket | <input type="checkbox"/> Pen and paper | <input type="checkbox"/> Chewing gum |
| <input type="checkbox"/> Camera | <input type="checkbox"/> Book | <input type="checkbox"/> Duct tape |
| <input type="checkbox"/> Plastic tarp | <input type="checkbox"/> Plates | <input type="checkbox"/> Mailing stamps |
| <input type="checkbox"/> Flashlight | <input type="checkbox"/> Knife | <input type="checkbox"/> Disinfectant |
| <input type="checkbox"/> Shampoo | <input type="checkbox"/> Light bulb | <input type="checkbox"/> Shoes |
| <input type="checkbox"/> Sewing kit | <input type="checkbox"/> Dried fruit | <input type="checkbox"/> Container of water |



© UNICEF/BANA2007-00342/Abir Abdulllah
Children find shelter in Charpara just before the cyclone hits Bangladesh.



A displaced mother with her children in search of shelter in Charpara, Bangladesh.

Student Handout #16

A PICTURE SAYS A THOUSAND WORDS

Children stand amid the debris of their village, which was destroyed by the cyclone, near the township of Kunyangon in the southern Yangon Division. In May 2008 in Myanmar, an estimated 1.5 million people struggled to survive under increasingly desperate conditions in the wake of Cyclone Nargis, which hit the south-western coast on 3 May, killed some 100,000 people, and displaced 1 million across five states.



1. As a result of the cyclone, how many people in Myanmar had to struggle to survive under the desperate conditions?
2. UNICEF distributed pre-positioned emergency supplies to the hardest hit areas. What was included in these supplies?
3. What percentage of children in the worst-affected areas were suffering from diarrhoea, a major threat to children's lives in emergencies?
4. To combat diarrhoea and other waterborne diseases, what did UNICEF airlift into Myanmar?
5. How long has UNICEF been working in Myanmar?
6. How would relief in Myanmar differ from relief in Canada?
7. What can we do to make this picture different?
8. What natural disaster plan would you suggest for Myanmar for the future? What obstacles are there to implementing this plan?

Student Handout #17

ANSWER KEY A PICTURE SAYS A THOUSAND WORDS

Children stand amid the debris of their village, which was destroyed by the cyclone, near the township of Kunyangon in the southern Yangon Division. In May 2008 in Myanmar, an estimated 1.5 million people struggled to survive under increasingly desperate conditions in the wake of Cyclone Nargis, which hit the south-western coast on 3 May, killed some 100,000 people, and displaced 1 million across five states.



1. As a result of the cyclone, how many people in Myanmar had to struggle to survive under the desperate conditions?

Answer: 1.5 million

2. UNICEF distributed pre-positioned emergency supplies to the hardest hit areas. What was included in these supplies?

Answer: water-purification kits, essential drugs for hospitals, shelter materials and mosquito nets

3. What percentage of children in the worst-affected areas were suffering from diarrhoea, a major threat to children's lives in emergencies?

Answer: 20%

4. To combat diarrhoea and other waterborne diseases, what did UNICEF airlift into Myanmar?

Answer: 3 million water purification tablets

5. How long has UNICEF been working in Myanmar?

Answer: 58 years

6. How would relief in Myanmar differ from relief in Canada?

A possible answer could be that the Canadian government would organize and fund the relief programs.

7. What can we do to make this picture different?

a. Possible answers include:

b. taking action to stop the effects of climate change

c. donating to organizations like UNICEF that provide disaster relief

d. supporting programs tasked with working with world governments to help them prepare for possible natural disasters

8. What natural disaster plan would you suggest for Myanmar for the future? What obstacles are there to implementing this plan?

A possible answer could be to educate the people of Myanmar on disaster preparedness. The main obstacles could include a lack of funds and the difficulty involved in reaching people in rural communities.

NATURAL ENVIRONMENTS



INTRODUCTION

We all rely on our forests for life. They provide oxygen, remove air pollution, lower temperatures and add moisture to the air.

Forests also, provide fuel for warmth, furniture, paper and many other products that we deem necessary for our current lifestyles.

As self-defeating as it may seem, we are destroying our forests, often in the name of those lifestyles, forgetting that short-term gains can mean long-term loss.

Children have the right to a clean and safe environment, and our forests are their inheritance. We have a responsibility to uphold those rights.

The people, especially children, most vulnerable to environmental degradation are in developing countries, but the issue also affects Canadian youth.

The **good news** is that it is not too late to change this picture and protect our forests. A good place to start is understanding the issues and then doing our part to make a difference.

Sudan, 2012

A boy from Sudan's Blue Nile State wades through waters caused by seasonal flooding, near a child-friendly space in the Yusuf Batil camp for refugees, in Maban County, Upper Nile State. Seasonal flooding has affected over 245,000 people across the country. Floodwaters heighten the risks of waterborne diseases, particularly in crowded refugee camps, and complicate the transportation of food and other critical supplies by relief workers.

There is growing international recognition of the value of Aboriginal traditional knowledge as an important resource for combating climate change. Generally speaking, Aboriginal communities differ from Western science in that they view themselves as one element within a fully integrated environment rather than as objective observers. As Dene Elder George Blondin (1997) explains, "We are people of the land; we see ourselves as no different than the trees, the caribou, and the raven, except we are more complicated" (Blondin, pg.18)⁸. In order to incorporate Aboriginal traditional knowledge into resource management and environmental assessment, the Canadian government works in collaboration with the Assembly of First Nations and Aboriginal communities to formulate policies associated with environmental sustainability. For more information about the Assembly of First Nations Environmental Stewardship please visit: <http://www.afn.ca/index.php/en/policy-areas/environmental-stewardship>

ACTIVITIES

The curricula links below are addressed in this theme. For an extensive list of relevant provincial expectations/outcomes, refer to Appendices G and H: Curriculum Links (pages 142 and 146), and Appendix I for links in Alberta, Saskatchewan, Manitoba and Quebec.

Province	Course	Expectation/Learning Outcome
Ontario	SBI3U Biology, Grade 11 <i>Diversity of Living Things</i>	B1. Analyze the effects of various human activities on the diversity of living things
Ontario	SVN3M Environmental Science, Grade 1 , University/College Preparation <i>Sustainable Agriculture and Forestry</i>	D1. Evaluate the impact of agricultural and forestry practices on human health, the economy, and the environment D3. Demonstrate an understanding of conditions required for plant growth and of a variety of environmentally sustainable practices that can be used to promote growth.
British Columbia	Geography 12 <i>Biomes</i>	Analyze the interactions between human activity and biomes, with reference to: <ul style="list-style-type: none"> • Deforestation • Desertification • Soil degradation • Species depletion
British Columbia	Sustainable Resources 12 <i>Forest Resources and Society</i>	Analyze current forest management practices.

⁸ Blondin, G. (1997). *Yamoria the lawmaker: Stories of the Dene*. Edmonton, AB: NeWest Press.

Setting the Stage

Objective: To define natural environment as it relates to climate change

Time: 15 minutes

Materials

- Reused paper for each student (personal white boards or laptops)
- Appendix E: Reflect and Act (page 139)

ACTIVITY

1. Explain that you will be discussing natural environments and how climate change can alter our global natural environments.
2. Distribute Appendix E: Reflect and Act on page 139 to each student and ask them to journal lessons learned during discussion and activities around the theme.
3. Ask students to draft a personal definition of what “natural environment” means. Next, ask them to list ways that climate change can alter this definition. For example, an example of a natural environment is a forest. Climate change will bring an increase in forest fires altering the forest natural environments. Have a few students share their responses.

Amazing Amazon

Objective: To expand on the knowledge of why trees are essential to our existence

Time: 60 minutes

Materials

- Reused paper for each student (personal white boards or laptops)
- Highlighters
- Student Handout #19: Amazing Amazon
- Clip #6: In the Name of Progress (39 minutes). This can be found here: <https://www.youtube.com/watch?v=8y3pPt3dITQ>

ACTIVITY

1. Get ready to set a timer for two minutes.
2. Instruct groups or individual students that they will have two minutes to record all the direct and indirect benefits trees give us. Examples will include oxygen, carbon sinks, chairs, paper, medicine, hydro poles, etc.
3. Discuss which benefits are essential to our survival (oxygen) and which are not (chairs). Ask

students to highlight the essential benefits, and explain that children have the absolute right to live in a decent environment and have access to the essential benefits trees give us. The rights of children are codified in the UN Convention on the Rights of the Child (CRC) the world's most widely ratified human rights treaty and the foundation for UNICEF's work with and for children. Refer to Appendix B: The UN Convention on the Rights of the Child in Child-Friendly Language (page 135) for more information.

4. Distribute Student Handout #19: Amazing Amazon (page 83) and ask students to discuss the questions found at the end of this handout.
5. Play and discuss Clip #6, In the Name of Progress, found at <https://www.youtube.com/watch?v=8y3pPt3dITQ>. This clip is about 40 minutes in length (you may not need to watch it all) and is produced in partnership with Greenpeace. It details what is happening in the Amazon Rainforest with respect to the global increased demand for soya products.
6. If time permits, assign each group a further research task. The tasks could be to:
 - Write a letter to a local politician or the Minister of Environment to support local efforts to save the Amazon Rainforest
 - Learn about the Forest Stewardship Council (FSC), an organization that promotes the responsible management of forests. Research local businesses to learn who is selling FSC certified products
 - Research the indigenous peoples of the Amazon to learn about their plight to save their homeland.

Forest Fables Card Game

Objective: To understand the importance of biodiversity in a forest and how the loss of this diversity adds to the effects of climate change.

Time: 30 minutes

Materials

- Six sets of Student Handout #20: TREE cards
- Six sets of Student Handout #21: SITUATION cards

ACTIVITY

1. Explain that biodiversity is the variation of life forms. Ask students to comment on why biodiversity is essential in a forest. Remind students that we need to protect the biodiversity on the planet because, "in losing that vast reservoir of diversity, we are allowing an utterly irreplaceable asset base to be removed. And it cannot be brought back."¹ Also, if we favour one species over biodiversity, it can impact climate change further. For example, if a forest is planted only with pine trees, what happens to that forest if the Mountain Pine Beetle attacks the trees and destroys that forest?

2. Arrange the students into six groups.
3. Explain that groups will play a card game called Forest Fables. The object of the game is to preserve the trees in your forest and to have at least six different species of trees in your forest. The winner will be the one with the most diversity in their forest (the one with the most variety of TREE cards at the end of the game).
4. Explain the rules of play. You might want to make a copy of these rules to distribute to each group.
 - The game consists of two decks of cards: The TREE cards — Student Handout #20 (page 84) and the SITUATION cards — Student Handout #21 (page 86). Place both decks face down and side-by-side, in the middle of the group.
 - To begin, one player randomly hands out four TREE cards to each player.
 - The student whose birthday is closest to the current day begins. Taking turns, players pick up one SITUATION card, read aloud, and follow the directions. The SITUATION cards will either ask players to pick up or discard TREE cards. If the player does not have TREE cards to discard when asked, the next player will take a turn.
 - If the SITUATION card reads ALL PLAY, this situation affects all players. All players must do what is asked on the card.
 - Record details of each SITUATION card to use for later discussion.
5. At the end of 15 minutes, ask players to count how many different species of TREE cards they have. The winner in each group is the player with the most diverse forest and the greatest number of species of TREE cards.
6. As a class, discuss the SITUATION cards, which are based on true events that are occurring today. Topics you can further explore are forest fires, both natural (serving vital ecosystem functions) and man-made (clearing land for farming); climatic changes in the world caused by cutting down the rainforest, and how children are affected by the climatic changes when forests are cut down. Here are some good sites on trees:

[Environmental Literacy Council
http://www.enviroliteracy.org/article.php/46.html](http://www.enviroliteracy.org/article.php/46.html)

Natural Resources Canada
<http://cfs.nrcan.gc.ca/forestresearch/subjects/biodiversity>

World Wildlife Fund <http://www.worldwildlife.org/what/wherewework/amazon/index.html>.

Keep the discussion going

Discuss biodiversity. Why is it important to have a variety of different species of trees, plants and animals in a forest? How does this affect climate change and children?

Some argue that the rainforest preservation movement is in the way of “progress.” Explain this statement in reference to climate change.

What do you know about the pine beetle? On the Internet, search “pine beetle temperature” for details on how temperature affects the pine beetle.

What can you, your school, your community, do to save our rainforests, and therefore help reduce the

effects of climate change on children?

We can support organizations that are protecting our rainforests and we can ensure the wood products we purchase are FSC certified.

How can the concept of an ecosystem apply to children's right? (all are connected, equally important and essential...)



YOUTH TAKE ACTION

Challenge for Change!

Distribute Student Handout #18: Youth Take Action (page 81) and discuss the inspirational profiles. Instruct students (groups, pairs or individuals) to select ONE student project listed under the Challenge for Change Action or invite them to create their own challenge. Set appropriate timelines and criteria. Evaluate each project using Appendix C: Culminating Task Rubric on page 137.

BACKGROUNDERS NATURAL ENVIRONMENTS

What is the issue?

A healthy natural environment is essential to reduce the effects of climate change. Changes in land use, deforestation and agriculture all contribute to a rise in the emission of carbon dioxide. Human activities, primarily in the developed countries, rely almost exclusively on the use of fossil fuels, which release vast amounts of carbon dioxide, all contributing to climate change. Although some efforts are in place to protect our natural environment, we need to do more to counteract many of the harmful activities that are currently taking place, such as:

- Forests being destroyed to provide wood, and sometimes to plant alternate crops such as soy or palm oil
- Vegetated land being developed into housing, roads and buildings, resulting in urban sprawl
- Natural resources being used extensively for construction, industries, transport and consumption
- Ever-increasing volumes of solid waste being created, which result in the destruction of fertile vegetated land to create landfill.



What is the wood used for?

Wood from forests is used in many aspects of our lives:

- Buildings
- Goods
- Fuel source; in developing countries, wood is being used as the fuel source for cooking and heating homes. Burning wood in the home results in very poor indoor air quality that can result in deaths of infants and young children. A solution to this issue is to switch from solid fuels to renewable energy sources, however we in the developed countries have to offer support to developing countries to make this happen.²

Deforestation facts

The destruction of our forests has far-reaching effects; these are some of the effects on our forests:

- Deforestation contributes more to global carbon emissions every year than the transport sector
- The oxygen trees produce removes air pollution, lowers temperatures and adds moisture to the air
- Trees hold soil in place and reduce run-off from streams
- Trees prevent soil erosion, control avalanches and mitigate desertification.
- Deforestation is contributing to flash-flooding and the destruction of homes and crops directly affecting the lives of children³

Forests store 283 gigatonnes of carbon in their biomass — curbing deforestation is essential in order to reduce carbon emissions

However, we can still use wood in various ways without destroying our forests. There are a number of forest certification systems that ensure that the wood is being harvested sustainably, allowing wood to be used as a renewable resource, instead of clear cutting, and destroying a resource that can never be replaced to its full capacity.

Deforestation for other crops

Forests are not just being destroyed for the wood:

- In Sumatra and Borneo, over 4 million hectares of forest are being converted to palm oil. The palm oil is being used to create biofuels. To harvest a palm oil plantation, the forest is burnt, the habitat is destroyed, and the ground is drained; more carbon is released from the peat on the forest floor. Also, biofuels often use more energy than they produce.
- In the National Park in Kalimantan, Indonesia, for example, many species are being rendered extinct and thousands of indigenous people are being evicted⁴

Ethiopia today

At the turn of the 20th century, 40% of Ethiopia was covered by forest. As of 2007, that figure was just 3%. As a consequence, deforestation is jeopardizing livelihoods and taking its toll on children's development, most especially in its remote and underdeveloped regions.

In 2007, as part of its millennium celebrations, the Government of Ethiopia pledged to plant more than 60 million trees across the country. They have engaged children and young people to plant and nurture two-year old seedlings from five indigenous species. UNICEF is a key partner in this initiative, contributing to the planting of at least 20 million trees.⁵

To learn more about climate change connected to natural environment, view the UNICEF UK Climate Change Report 2008: Our climate, our children, our responsibility found at

NOTES

1. Juniper, Tony, *Saving Planet Earth* (London: Collins, 2007), p. 60.
2. UNICEF UK, *Our climate, our children, our responsibility*, p. 32.
3. *Ibid.*
4. Monbiot, George, *Heat: How to Stop the Planet From Burning*, p. 159.
5. UNICEF UK, *Our climate, our children, our responsibility*, 2008, p. 32.

Student Handout #18

YOUTH TAKE ACTION

Challenge for Change action items

Be part of the solution! Complete ONE project from the list below or create your own! You will be evaluated on criteria including knowledge of the issue, expression of ideas and connections made between personal, local and global views of the issue.

Research global forest preservation. View the following video: Oil in Eden: The Battle to Protect Canada's Pacific Coast at <http://www.youtube.com/watch?v=aO4s4P7eFk4>.

PROJECT: Contact The Nature Conservancy of Canada (NCC) which is Canada's leading national land conservation organization. Since 1962, NCC and partners have helped to conserve more than 2 million acres (over 800,000 hectares) of ecologically significant land nationwide. Organize a fundraiser so your school can become involved in preserving ecologically significant land in your region. For more information see <http://www.natureconservancy.ca>.

Research deforestation. View the following video: Amazon Deforestation: Timelapse at <https://www.youtube.com/watch?v=oBIA0lqfcN4>.

PROJECT: After viewing the time-lapse video, use Google Earth's (<http://www.google.com/earth/index.html>) satellite view to explore areas of the earth where deforestation has occurred. Can you find regions of rainforest with high deforestation rates? How might high rates of deforestation affect the families and children in the nearby villages?

Research the concept of a life cycle analysis (LCA). An LCA for a product (i.e. chair) involves looking at the total environmental impact of the production, use and disposal of that product. View the following video: The Story of Stuff at <http://www.storyofstuff.org/movies-all/story-of-stuff/>.

PROJECT: Devise a simple LCA of a piece of clothing or a pair of running shoes. Check out William McDonough's book, *Cradle to Cradle*, which details how we can go from a "throw away" society, to one that can make a product with very little environmental impact. Also, visit <http://www.gdrc.org/uem/lca/life-cycle.html>.

PROJECT: Identify "stuff" at your school (e.g., paper, uniforms, computers, sports equipment, etc.) that could be changed to reflect a more environmentally responsible product life cycle. Come up with recommendations (switch suppliers, urge suppliers to improve their practices, reduce the use of the items, etc.) and present these to your school's administration.

PROJECT: Interview local businesses about their environmental policies. Present your findings to your class, identifying both positive practices and areas where improvements are needed.

PROJECT: Create a petition about a product you feel could use a revitalization of its lifecycle. (For

Lusaka, Zambia

In March 2009, in support of the Millennium Development Goals, UNICEF Zambia's Child Ambassadors led a group of schoolchildren in planting hundreds of trees at the Beit Cure Children's Hospital in the Zambian capital. Around 80 youths planted 300 fruit and fast-growing trees. In addition to addressing problems caused by deforestation, these young people are also taking action to address food security issues. For more information see <http://www.unicef.org>.

Kiilnik High School, Cambridge Bay, BC

Students witness the effects of climate change such as the snow conditions during the Victoria Day weekend when they hold the "Omingmak Frolics" snowmobile races. Every year it appears the conditions are becoming wetter and slushier than the year prior. As a class, they discussed the "David Suzuki's Nature Challenge" and came up with a list of actions they could do as northerners to help save the planet. For more information see <http://www.climatechangenorth.ca>.

example, students created a petition so that Crayola would begin to take back and recycle their markers: <http://www.change.org/petitions/crayola-make-your-mark-set-up-a-marker-recycling-program>)

Trees and plants act as carbon sinks to store carbon dioxide and to produce oxygen. Research a national tree planting organization and what you see as their most effective actions.

PROJECT: Plant or adopt a tree on the school grounds in honour of your class and/or start a school garden. Encourage composting in the cafeteria and use that compost on the garden.

Student Handout #19

AMAZING AMAZON

“My name is Nadino Calapucha and I’m 16 years old. I belong to the Kichwa nation from the Amazon region, the heart of the green tropical forest. I admire my parents, my community and the organizations that have given their whole-hearted support and efforts to fight for my forest, for the rights of children and community rights. (We need to) forbid authorities to allow logging, oil, and other companies to enter our communities because we the children are the ones who are the hardest hit by their activities.”



Adapted from *Nadino Calapucha Lives in the Amazon Rainforest* found at http://www.unicef.org/ecuador/programme_proandes_8530.htm.

The Amazon Rainforest is an amazing place, which reaches the borders of eight countries, including Brazil. Fifteen percent - the size of France - of the Amazon Rainforest has already been destroyed.

The Amazon Rainforest has often been called the “lungs of the planet” as it acts as a carbon sink and releases oxygen. Not only is it rich with plants and trees, but it is also our largest river basin and the source of 20% of all free-flowing fresh water on the planet.¹

“As if the depredations of loggers, ranchers, soya farming and mining weren’t serious enough in causing degradation, fragmentation and progressive clearance of this incredible planetary asset, it now seems that there is a far larger threat to the Earth’s largest rainforest: a lack of rain.”²

Over 2,000 tropical forest plants have been identified with some form of anti-cancer elements but we have only tested 10% of the plants available; many are becoming extinct before being researched. The original malaria drug, Quinine, was discovered in the bark of a cinchona tree. Also, skin taken from a species of frog in the Amazon is part of a compound that helps treat Alzheimer’s disease.³

Soya is a protein-rich food that is a base in many foods we eat and in the livestock feed we use to raise cattle and chicken. Soya can now be harvested in the rainforest soil, and as a result some of the Amazon Rainforest is being cleared to make way for soya plants. We need to think about why such large amounts of rainforest are being cleared. *We need to protect our rainforests. We need them for life!*

Discuss and record answers on the back...

1. List five actions you can take locally to save the Amazon Rainforest.
2. What global policies should be in place to protect the rainforest? For example, the Forest Stewardship Council (FSC) supports environmentally appropriate, socially beneficial, and economically viable management of the world’s forests. For more information see <http://www.fsccanada.org/>.
3. How does climate change affect the rainforest? How does the rainforest (or the degradation of it) affect climate change?
4. To what extent are children more susceptible to the loss of the rainforest?

NOTES

1. World Wildlife Federation, “Amazon: World’s Largest Tropical Rain Forest and River Basin,” <http://www.worldwildlife.org/what/wherewework/amazon/index.html> (accessed May 2009).
2. Juniper, Tony, *Saving Planet Earth*, 2007, p. 136.
3. Ibid.

Student Handout #20

TREE CARDS

ASH	ASH
ASH	ASH
ASPEN	ASPEN
ASPEN	ASPEN
BIRCH	BIRCH
BIRCH	BIRCH
CEDAR	CEDAR
CHERRY	CHERRY
CHERRY	CHERRY
ELM	ELM
ELM	ELM
FIR	FIR
FIR	FIR

TREE CARDS

FIR	FIR
MAPLE	MAPLE
MAPLE	MAPLE
LINDEN	LINDEN
LINDEN	LINDEN
OAK	OAK
OAK	OAK
PINE	PINE
PINE	PINE
POPLAR	POPLAR
POPLAR	POPLAR
SPRUCE	SPRUCE
SPRUCE	SPRUCE
SYCAMORE	SYCAMORE

Student Handout #21

SITUATION CARDS

<p>A Brazilian farmer was offered good money, so he cleared his land to manage a cattle ranch.</p> <p>Discard 2 TREES</p>	<p>Forest Stewardship Council (FSC), an independent, non-profit NGO, ensures wood products with its stamp come from a sustainable forest.</p> <p>Collect 2 TREES</p>
<p>ALL PLAY</p> <p>The forest was devastated by a hurricane, probably due to climate change.</p> <p>Discard 3 TREES</p>	<p>Due to climate change, the pine beetle has devastated the pine trees in the area.</p> <p>Discard all Pine TREES</p>
<p>Some farmers are forced off their land to make way for a soya plantation. The land is cleared.</p> <p>Discard 2 TREES</p>	<p>A new medicine to fight childhood leukemia was found from a bark of one of the trees. Those trees are saved.</p> <p>Collect 3 TREES</p>
<p>The diversity of the forest is threatened as rainfall decreases. Researchers feel that this lack of precipitation is caused in part by climate change.</p> <p>Discard 2 TREES</p>	<p>ALL PLAY</p> <p>UNICEF Zambia's Child Ambassadors led a group of schoolchildren in planting hundreds of trees at Children's Hospital in Zambia.</p> <p>Collect 4 TREES</p>
<p>People are adopting a plant-based diet so fewer forests are cleared to manage livestock.</p> <p>Collect 2 TREES</p>	<p>A local aboriginal territory is being reforested. Trees are being protected.</p> <p>Collect 2 TREES</p>
<p>A local timber company continuously studies the forest microsystem to ensure the soil can support new seedlings.</p> <p>Collect 2 TREES</p>	<p>The increase in hot, dry weather is likely due to climate change and results in increased forest fires.</p> <p>Discard 2 TREES</p>

SITUATION CARDS

<p>As we burn fossil fuels (releases CO₂) and clear trees (stores CO₂), the balance of the carbon cycle is tipped. Because of their developing respiratory systems, children are most at risk.</p> <p>Discard 2 TREES</p>	<p>A youth from the Kichwa Nation from the Amazon region joins the fight to save the rainforest; the Amazon rainforest is referred to as the lungs of our planet.</p> <p>Collect 2 TREES</p>
<p>Over 2,000 tropical forest plants have been identified with some anti-cancer elements, but many plants are becoming extinct before being researched.</p> <p>Discard 2 TREES</p>	<p>By holding soil in place and reducing run-off from streams, trees prevent soil erosion, control avalanches and mitigate desertification.</p> <p>Collect 2 TREES</p>
<p>Deforestation is contributing to flash-flooding and the destruction of homes and crops directly affecting the lives of children.</p> <p>Discard 1 TREE</p>	<p>Tropical hardwood floors are an inexpensive way to renovate but the environmental impact is the loss of trees from the rainforest.</p> <p>Discard 3 TREES</p>
<p>In developing countries wood is used to cook food and heat the home, resulting in poor air quality, which can mean death in infants and young children.</p> <p>Discard 2 TREES</p>	<p>In Sumatra, forests are being converted to palm oil; the forest is burnt, the habitat is destroyed, and the ground is drained.</p> <p>Discard 2 TREES</p>
<p>ALL PLAY</p> <p>At the turn of the 20th century, 40% of Ethiopia was covered by forest. Today it's just 3%.</p> <p>Discard 3 TREES</p>	<p>Deforestation is jeopardizing livelihoods and taking its toll on children, especially underdeveloped regions.</p> <p>Discard 2 TREES</p>
<p>In 2007, Ethiopia pledged to plant 60 million trees, with the help of children and youth.</p> <p>Collect 2 TREES</p>	<p>UNICEF is contributing to the planting of at least 20 million trees in Ethiopia.</p> <p>Collect 2 TREES</p>

SITUATION CARDS

<p>Scientists warn that the effects of climate change will lead to the emergence of new disease. One such a disease threatens elm trees.</p> <p style="text-align: center;">Discard all elm TREES</p>	<p>A local youth group raises money to support the efforts to save the Amazon rainforest.</p> <p style="text-align: center;">Collect 2 TREES</p>
<p>A local Brazilian family was forced off their land to plant soya due to the global demand for this crop. The land is cleared.</p> <p style="text-align: center;">Discard 2 TREES</p>	<p>Since 1962, Nature Conservancy of Canada (NCC) and partners have helped to conserve more than 2 million acres of ecologically significant land in Canada.</p> <p style="text-align: center;">Collect 2 TREES</p>
<p>Deforestation is contributing to soil degradation so new plants are struggling to grow.</p> <p style="text-align: center;">Discard 1 TREE</p>	<p>More consumers are asking for 100% recycled paper so demand for virgin paper decreases.</p> <p style="text-align: center;">Collect 1 TREE</p>
<p>A school in Vancouver raises money to buy solar ovens for a village in Darfur. Wood is no longer needed for cooking fuel.</p> <p style="text-align: center;">Collect 2 TREES</p>	<p>A local school adopts an old growth tree to protect it from logging.</p> <p style="text-align: center;">Collect 1 TREE</p>
<p style="text-align: center;">ALL PLAY</p> <p>An infestation of a new bug has wiped out all cedar trees. Foresters blame climate change.</p> <p style="text-align: center;">Discard all Cedar TREES</p>	<p>A local secondary school becomes carbon neutral and plants 10 trees on the school grounds as part of the plan.</p> <p style="text-align: center;">Collect 2 TREES</p>

WATER



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INTRODUCTION

Water is essential to life; without it we cannot survive. Without food we can survive for approximately a month; without water we can only live for a few days. Children have the right to safe drinking water, and climate change is adding to water stress worldwide. Droughts, melting icecaps and contamination caused by flooding are all affecting our water sources.

Water is our most precious resource. It is important that we work with our youth to protect their future supplies. We need to understand the importance of water, and how conserving it and only using what we need is critical to our survival.

The **good news** is we **can** manage our water to provide safe drinking water and we can start by understanding the issues and then doing our part to make a difference.

Bangladesh, 2000

In 2000 in Bangladesh, a smiling two-year-old girl, Richi, splashes water drawn for her bath in a small plastic basin, beside a No. 6 tubewell in the village of Chandai in Manikganj district, west of Dhaka, the capital. The tubewell was installed with UNICEF assistance.

Canada's Aboriginal communities view water as essential to both physical and spiritual life. Aboriginal communities believe that in the beginning of time, the creator gave instructions to Aboriginal peoples to respect water, air, and the earth by keeping it pure⁹. The Inuit have a particularly special relationship with water because of their traditional patterns of hunting and gathering. Visit: <http://www.teachersdomain.org/resource/ipy07.sci.ess.watcyc.lpmeltingice/> to access a lesson plan outlining the effects of melting polar ice on Inuit peoples.

ACTIVITIES

The curricula links below are addressed in this theme. For an extensive list of relevant provincial expectations/outcomes, refer to Appendices G and H: Curriculum Links on pages 142 and 146, and Appendix I for links in Alberta, Saskatchewan, Manitoba and Quebec. .

Province	Course	Expectation/Learning Outcome
Ontario	SVN3E Environmental Science, Grade 11, Workplace Prep <i>Human Impact on the Environment</i>	B2. investigate air, soil, and water quality in natural and disturbed environments, using appropriate technology; B3. demonstrate an understanding of some of the ways in which human activities affect the environment and how the impact of those activities is measured and monitored.
Ontario	SCH3U Chemistry, Grade 11 <i>Solutions and Solubility</i>	E1. analyze the origins and effects of water pollution, and a variety of economic, social, and environmental issues related to drinking water
British Columbia	Science and Technology 11 <i>Natural Resources and the Environment</i>	Discuss the impact of society on natural resource management and the environment.
British Columbia	Geography 12 <i>Resources and Environmental Sustainability</i>	Assess the environmental impact of human activities, including: <ul style="list-style-type: none"> • energy production and use • forestry • agriculture • waste disposal • water use

⁹ Environment Canada, Water and Canada's Aboriginal People, <http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=BA5125BF-1> (accessed May 2013)

Setting the Stage

Objective: To illustrate the interconnectedness of water and climate change.

Time: 15 minutes

Materials

- Reused paper for each student (personal white boards or laptops)
- Appendix E: Reflect and Act (page 139)
- Movie clip *2Lives: 2 Miles// Water*.
<http://www.youtube.com/watch?v=Jykd1absGbY&feature=BFa&list=PLD6AA4215618717BB>

ACTIVITY

1. Explain that you will be discussing water and the right that we all have to safe, clean drinking water and proper sanitation, as mentioned in Article 24 of the UN Convention on the Rights of the Child. Children have the right to good quality health care the best health care possible to safe drinking water, nutritious food, a clean and safe environment and information to help them stay healthy. Rich countries should help poorer countries achieve this.
2. Distribute Appendix E: Reflect and Act (page 139) to each student and ask them to journal lessons learned during the movie clip, class discussion and activities around the theme.
3. Try a Think-Pair-Share activity. Ask pairs of students to list global water concerns facing children. Discuss what “water and sanitation crisis” might mean and what role climate change could play. Next, join students in larger groups to discuss.
4. Share that water is a basic need that is essential to our existence. Ask students to brainstorm water uses, both for our survival and pleasure. Every child has the right to clean drinking water, but this is not the reality in many developing countries. Access to safe, clean water is many areas is becoming scarce as “climate change dries up the water tables and depletes rainfall, leaving communities to battle the devastating effects of drought.”¹

Let it Rain!

Objective: To discover successful global water conservation and sanitation practices that are part of the solution to water shortages due to the effects of climate change.

Time: 40 minutes

Materials

- Slide show on Indonesia’s rainwater harvest and media set-up found at <http://www.unicef.org/indonesia/7749.html>
- Student Handout #24: Bio-Sand Filter
- Student Handout #25: UNICEF Basic Family Water Kits

ACTIVITY

1. Arrange students into six groups.
2. Explain that although some children in developing countries have to walk up to 3km to collect water for their families, this is preferable to having no safe drinking water available. Climate change will result in a shortage of safe drinking water for most of the world. Pollution and improper management of human waste threaten the safe water sources currently available. Incidences of waterborne disease like diarrhoea, cholera and typhoid will increase and will claim the lives of million of children in the developing world. (It is important to note that girls often cannot attend school as they are the ones tasked with collecting water.
3. There are two Water Case Studies - Student Handout #24: Bio-Sand Filter (page 101) and Student Handout #25: UNICEF Basic Family Water Kits on page 102. Distribute the bio-sand filter case study to half the groups, and the UNICEF water kits case study to the other half. Ask groups to discuss the case study and complete the task on the bottom of the case study. The task is to create a one-minute public service announcement or radio jingle.
4. Ask each group to present its findings to the class.
5. Show the photo essay on Indonesia's rainwater harvest at <http://www.unicef.org/indonesia/7749.html> and discuss. Ask students to consider the fact that climate change will likely bring less rainfall. What can be done to help minimize the effects of less rain?

Keep the discussion going

List ways in which you use water in your life. What strategies would you employ if you suddenly were restricted to using no more than 20 litres of water per day?

Many feel that water will be the “oil” of this century. Why would people make this statement? Do you agree with it? Why or why not? What consequences could we face by selling Canada's water in a global market?

Read the following on the topic: <http://www.cbc.ca/news/background/water/> and <http://www.davidsuzuki.org/issues/freshwater/>

List connections between poverty and water. Explain. How can you conserve potable water in your life? How does this affect global water issues and help children in developing countries?

Water Run Clean

Objective: To consider how climate change is affecting the availability of clean sources of water in developing countries. To understand the importance of reusing water as an alternative to finding new sources of clean water supplies, you will design and test a water filtration system.

Time: 60 minutes

Materials

- 2 litre empty plastic bottle (pop/water) for each group (no bottle cap)

- Scissors for each group
- Paper and pencil to record design and results
- Various filtering materials such as coffee filter, cotton wool, cheese cloth, sand, gravel. The sand and gravel must be clean (run under water in a sieve or colander). Activated carbon could also be added to the list - this is readily obtainable from pet stores that stock aquarium supplies. You can add other materials to use a filter medium, or alternatively, ask the students to bring their own filtering mediums.
- One TDS (Total Dissolved Solids) Meter (approximately \$40). Here is a link to Canadian distributors: <http://www.tdsmeter.com/>
- Mix of tap water with mud to provide a cloudy liquid (enough for 250ml per group approximately 1:10 ratio). Mix this in one batch so students all start with the same water to filter.
- Selection of beakers or equivalent for each group
- Student Handout #26: Water Run Clean

ACTIVITY

1. Remind the students that when we turn on the taps here in Canada (in most locations!), water comes out. But in many parts of the world, water doesn't come as easily or as safely. Climate change is impacting our world's drinking water by drying up our fresh water supplies, altering our rain water patterns (rather than falling overland, rain develops in the rising air above the warm ocean), and causing natural disasters that can contaminate our drinking water. It is becoming more challenging globally to access clean drinking water especially in developing countries where access to clean water is already an issue.
2. Explain that as the impacts of climate change affects our global water supply, it becomes important that we clean and reuse our water and not have to go on increasingly longer searches for clean water. (In developing countries, people, often young girls, walk 3km to get their water. Climate change can make this journey even longer.)
3. Discuss that testing water to ensure it is safe to drink requires several tests. Drinking water should be clear, odourless and colourless.
4. Present your students with the following scenario: a village in an African country has experienced a mudslide which has contaminated the local drinking water. Explain to students that there are several tests that need to be performed before you can determine if water is safe to drink, and one test is the total dissolved solids (TDS), which measures how much organic and inorganic substances are in a liquid. Challenge students to devise a system to clean the TDS from the water.
5. According to the World Health Organization (WHO), the maximum TDS is 1,000ppm (parts per million) and in the US, according to the Environmental Protection Agency (EPA), it is 500ppm. High levels of TDS can give water a murky appearance and affect the taste. Also, bacteria can stick to solids. So if a water supply has a low TDS level, it is less likely to contain bacteria. The TDS Meter will be used to measure ppm.
6. Arrange the students into groups of four and explain that they will be designing and testing a water filtration system. Set up stations of the various filtering materials for the students to access, or challenge students to create a design and collect their own materials.
7. Instruct groups to cut the water bottle in half and turn the neck end face down inside the base end of the bottle. The neck of the bottle should not touch the base.
8. Ask each group to design their filter system using the materials to create the most effective solution. Sketch the design on Student Handout #26: Water Run Clean illustrating the gradation

and thickness of the striations of the chosen filtering materials.

9. Have each group follow the instruction on Student Handout #26: Water Run Clean starting with collecting 250ml of contaminated water (muddy) to filter and test.

Class Post-experiment discussion

- Have the groups share their results. The top group will be the one with the most effective filtering system, and hence, the lowest (post filtering) ppm reading.
- What materials worked best? Did the order matter?
- Was the quantity of water less after filtering? Why?
- How did the visual quality vary?
- Is clear water safe to drink? Discuss why not? What could be in the water? (Answer: living micro-organisms that can cause disease and harmful chemicals.)

Keep the Discussion Going

How do we translate this experiment into a workable model for safely cleaning water in developing (and developed) countries?

One example is a natural water filter that first filters the water through ceramic filters (it takes approximately one hour to filter 1 litre), removing all suspended solids including biological contaminants. The water then filters through activated carbon containing nano silver (which inhibits bacteria growth). Silica sand can be used to provide additional filtration and zeolite can be used to remove heavy metals. This is only one example, and is a description of a filter system called Santevia (www.santevia.com). These, and similar filtering systems, are being used in developing countries to provide safe drinking water.

What happens when we add plants to a filtration system? What do the plants do to help clean the water? Discuss natural and constructed wetlands.

Discuss rainwater collection and filtration systems for various water uses. For what water uses can we employ rainwater in our homes?

What standards does Canada have for drinking water, and how do they compare to those in developing countries? Test your tap water.

Tests can include pH, total hardness, free chlorine, total chlorine, nitrite, copper and iron. A testing kit can be obtained from www.safewater.org. Remember that all children have the right to clean, safe drinking water.

To Stay or to Go?²

Objectives: By the end of the activity, participants will be able to explain how climate change can affect the lives and destinies of many children and families, and provide concrete examples.

Time: 40 minutes

Materials:

- Copies of the Student Handout 22 – situation cards
- A clock or a stopwatch

ACTIVITY

1. Explain that for the duration of the first part of this activity, students will move to a village in Swaziland (explain where it is located in Africa³). Read them the following scenario: “You and your family live in a small village in Swaziland. As a result of climate change, the weather in your village has changed dramatically and there has been very little rainfall for months. The well is drying up and you don’t have a nearby river. There is not enough water to drink for the whole village”.
2. Form three groups. Give each group a different “situation card” (Student Handout 22, page 99) Explain that starting from the situation that you just presented, each card describes the situation of a (different) family. Each group “is” that family, and should discuss internally what they should do (e.g. stay in the village or go? Why? What would they do then? Etc.). Give them 5 to 10 minutes to discuss.
3. Ask each group to present the situation of their family and explain what they decided to do.
4. Ask participants if it was difficult or easy to decide what to do, and why. Explain that for those who decide to stay, it is important to adapt to the new situation by anticipating the events and getting ready through training and other preparations. Tell them that many families in Africa have had to leave their homes. They are called “climate migrants”.
5. Explain that for the second part of the activity, the three groups will be playing the same role of a very poor family that decides to leave the village. Give each team “Situation Card No. 4”. Explain that there is more information about their situation on the card, including a set of things that they can potentially take with them from the village. Each group must work together and choose only 10 of these options, some of which might be people (such as doctors) and others might be items (such as clothes). They have three minutes to decide.
6. After three minutes, ask everyone to stop their discussion. Explain that because there is very little time left before their family leaves and resources are stretched, they must now choose only five items/people to take with them. They have one minute to decide.
7. After the minute is up, bring everyone together and ask each group to share what their five items were.
8. Ask participants how they felt about having to make their choices in such a rushed way. Can they imagine what it would feel like to leave their homes so quickly? And to leave behind most of their things and people they know and love? Which child rights were affected in this situation?
9. Explain that their families have now arrived at their new home, a little village in the western part of the country, where some distant relatives have a small farm. Ask each group to sit together and discuss how their families could adapt to their new life, knowing that they have few possessions (only the ones they brought with them), but that their relatives, even if they are poor, are willing to let them live with them. Ask each group to imagine and describe how the first two months would be. Give them 5 to 10 minutes, and then discuss this all together in plenary
10. To close the simulation, ask participants if they found it easy or difficult to imagine how it would feel to start everything over again in another place, far away from friends and familiar places. Maybe some of them already experienced something similar when they had to move with their family? What is important when such things happen?

Kisesa health Centre benefits from rainwater harvesting tank!

The Kisesa Health Centre, in Tanzania, provides health care for children and mothers, including treatment for diseases.

Before the rainwater harvesting tank was constructed, the centre had no choice but to buy water from a vendor. The amount they could purchase was insufficient to meet their needs, resulting in poor sanitation and the risk of infection for patients.

Flora Emmanuel was brought to the centre after a still birth. Because of a shortage of water, Flora recalled that “my mother had to ask for water from nearby homes for drinking, for my bath and for washing clothes.” Now that construction of the rainwater harvesting tank has been completed, the centre will be able to provide better services and sanitation for its patients.



Adapted from story found at <http://www.unicef.org/nz/article/760/KisesaHealthCentrebenefitsfromrainwaterharvestingtank.html>.



YOUTH TAKE ACTION

Challenge for Change!

Distribute Student Handout #23: Youth Take Action (page 100) and discuss the inspirational profiles. Instruct students (groups, pairs or individuals) to select ONE student project listed under the Challenge for Change Action or invite them to create their own challenge. Set appropriate timelines and criteria. Evaluate each project using Appendix C: Culminating Task Rubric (on page 137).

BACKGROUNDER WATER

What are the issues?

Currently around 1.1 billion people in developing countries have inadequate access to water and 2.6 billion people lack basic sanitation.⁴

Climate change is exacerbating this water stress in the following ways:

- Global warming results in the melting of ice caps causing sea levels to rise. It is estimated that if sea levels increase by about 40cm (roughly in the middle of the expected range for 2050), the number of people in danger of saltwater floods could grow from 75 million (today) to 200 million (2050). Salt water could pollute the drinking water in some of the largest urban centres on the coast such as Shanghai, Manila, Jakarta and Bangkok. According to some hydro-geologists, this could result in the cities being abandoned.⁵ “At 1.50C or less (an increase in global temperature) an extra 400 million people are exposed to water stress.”⁶
- Drought in southern Africa is closely related to the global warming of the Indian Ocean. Rather than falling overland, rain develops in the rising air above the warm ocean. Even a 10% drop in rainfall can reduce river flow by 50%.
- As a result of drought, water tables have not recovered and an increasing number of water points dry up in the summer.⁷

Impacts on health of unsafe water sources

Pollution and improper management of human waste threaten safe water sources. Each year, waterborne disease like diarrhoea, cholera and typhoid claim the lives of millions of children in the developing world. Diarrhoea spreads readily in environments where there is poor sanitation and where safe water is unavailable.

Irrigation and agriculture

Water is required for agriculture. Without water, crops will die resulting in loss of livelihood, malnutrition and starvation for the family.⁸

Access to safe drinking water

In many developing countries, the sources of safe drinking water are far from the villages. Often the children (primarily girls) are tasked with fetching the water. In southern Madhya Pradesh, India, tribal girls spend up to three hours a day collecting and arranging for water. The girls spend more time fetching water than being involved in education.⁹

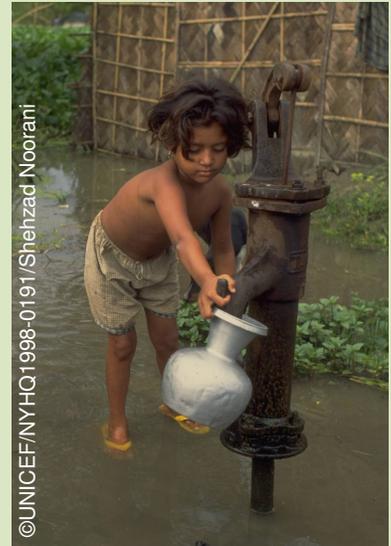


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Take action

UNICEF and partners have implemented a program called Wise-Water Management. This program includes water solutions such as rainwater harvesting, recycling of grey water, and pumping of water using a roundabout play pump (as children play at school they are pumping the water for later use). Tribal schoolgirls have formed a Water Safety Club and use a water safety plan taught by UNICEF to monitor these initiatives.¹⁰

Also, UNICEF has water, sanitation and hygiene (WASH) programs active in over 90 countries. WASH is designed



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to help improve access to water and sanitation, as well as educating children about essential hygiene behaviours such as washing hands with soap to help stop the spread of disease.

Children take action

“We here in our community are suffering from a lack of drinking water. Where safe water is available, it is too far away; most times we have to walk 10-15 minutes to places where we can access safe drinking water. I think the solution would be for us to recycle our waste water, as I am told has been done in some countries of the world.” Rasheeda, age 13, Nigeria¹¹



To learn more about climate change connected to water, view the UNICEF UK Climate Change Report 2008: Our climate, our children, our responsibility found at <http://www.unicef.org.uk/Documents/Publications/climate-change.pdf>

NOTES

1. UNICEF UK, Our climate, our children, our responsibility, 2008, p. 10.
2. Adapted from “Ready to go?”, activity from the resource pack “Heat up over climate change”, by tagd/UNICEF UK, <http://www.tagd.org.uk/campaigns/climatechange/climatepeeredpack.aspx>
3. The Kingdom of Swaziland is a land-locked country bordered by Mozambique in the east and South Africa on the other sides.
4. UNICEF UK, Our climate, our children, our responsibility, 2008, p. 15.
5. Monbiot, George, Heat: How to Stop the Planet From Burning, 2006, p. 8.
6. Ibid., p. 15.
7. UNICEF UK, Our climate, our children, our responsibility, 2008, p. 10.
8. Ibid.
9. Ibid.
10. Ibid.
11. Ibid., p. 28.

Student Handout #22

SITUATION CARDS

Context: You and your family live in a small village in Swaziland. As a result of climate change, the weather in your village has changed dramatically and there has been very little rainfall for months. The well is drying up and you don't have a nearby river. There is not enough water to drink for the whole village.

Situation Card No 1 (Family 1)

Your family is very poor and you no longer have enough water to feed your animals or to water the vegetables you grow.

(For discussion: Do you decide to stay or to leave? Why? What do you do when you have taken the decision?)

Situation Card No 2 (Family 2)

One day, people from a UN agency arrive in your village and tell you that they would like to teach you how to collect and use rainwater in a more efficient way. They also say that they are willing to finance some construction that will help you with the water problem.

(For discussion: Do you decide to stay or to leave? Why? What do you do when you have taken the decision?)

Situation Card No 3 (Family 3)

You are the wealthiest family in the village. You have a big farm. You have lost some cattle and drought is affecting your fields, too, but you can still survive easily, at least for a few extra seasons.

(For discussion: Do you decide to stay or to leave? Why? What do you do when you have taken the decision?)

Situation Card No 4

Your family is very poor and cannot survive much longer in the village. You decide to leave the village. You will have to leave the area very soon in order to survive. You will not be able to take everything you need.

Besides your mum and dad, you will be leaving with your elderly grandmother, your sister (age 1), your brother (age 7) and your family's six goats. You aren't sure where you are going, but your family has some relatives in the west and you are hoping the rainfall will be better there. The seasons are changing and the nights are getting colder. You don't know how long you will be travelling. Your family does not have any cars or oxen, so you will therefore have to find alternative means of transportation.

Things you could take: blankets, warm clothes, water, rice, bread, nappies/diapers, medical supplies, books, doctor, teacher, religious leader, plates, pots, firewood, radio, TV, tent, canvas, ropes, bucket, fruit, chocolate, milk, pillow, shoes, etc...

Student Handout #23

YOUTH TAKE ACTION

Challenge for Change action items

Be part of the solution! Complete ONE project from the list below or create your own! You will be evaluated on criteria including knowledge of the issue, expression of ideas and connections made between personal, local and global views of the issue.

Research the environmental impact of disposal water bottles. Most water bottles are made with a petroleum-based plastic that uses a great amount of energy and water to make, and therefore add to climate change. Plus, according to David Suzuki, “the growing demand for bottled water undermines confidence in public drinking water systems.”

PROJECT: Lobby to remove plastic water bottles from your school and promote tap water instead. Follow the progress of school districts that are looking at whether or not to ban plastic water bottles in schools.

Learn what UNICEF is doing to ensure everyone’s right to safe drinking water is realized. Research the water, sanitation and hygiene (WASH) program.

The Water, Sanitation and Hygiene website (<http://www.unicef.org/wash/>)

Read about what a rights based approach means on The Right To Water website (<http://www.righttowater.info/>). What are the benefits and challenges of such an approach?

PROJECT: Organize a fundraiser to raise money to support the WASH program. Start a competition (with an entry fee) and challenge students to develop a song promoting the WASH program.

Research The Tap Project, a campaign aimed at building awareness of clean, accessible water as a global child health issue. During World Water Day 2009, participating restaurants across Canada suggested patrons add a donation of \$1 for the tap water they received. For more information see <https://www.facebook.com/uniceftap>.

PROJECT: Create a YouTube clip, PowerPoint presentation or a song/jingle/PSA to encourage actions to promote the Tap Project. Include the details of the project, as well as statistics such as how many restaurants participated, how much money was raised, etc.

NOTES

Fraser Heights Secondary School School District # 36 – Surrey

Students at Fraser Heights Secondary sold reusable water bottles and built a bio-sand water filter to address water issues locally and globally. They also work with local elementary schools to raise awareness of sustainability issues. They are a 2009 winner of the BC Green Games! For more information see <http://www.bcreengames.ca>.



Lao primary school children working on the mural.

Vientiane, Lao People’s Democratic Republic [image]

To mark World Water Day 2009, Laotian school children worked together and let their creative sides shine to design a huge mural displayed at a central park. The young artists painted their own impressions and images of life along the Mekong River to raise local awareness about the sustainable management of water. For more information see <http://www.unicef.org>.

1. Suzuki, David and David R. Boyd, David Suzuki’s Green Guide (Toronto: Douglas & McIntyre, 2008), 68.

Student Handout #24

BIO-SAND FILTER

For over 10 years, the Gupta family had been drinking water from a tube well dug right outside their door. Therefore, no member of the family had to walk great distances to gather water. Unfortunately, it was recently discovered that the well water was contaminated with arsenic. “The symptoms started with nausea and weakness,” said Mr. Gupta, a resident of Thulo Kunwar village in Nawalparasi District. “In time, my skin hardened and small nail-like warts emerged on my palms, and soon I developed tumours, too.”



Jiuta Gupta draws water for her daughter through a new bio-sand filter, provided by UNICEF that helps eliminate arsenic.

“There are a few solutions that can be adopted immediately after identification of contaminated wells,” said UNICEF Nepal Project Officer Madhav Pahari. “The first, most reliable option is to find safe water from the nearest tube well for cooking and drinking. Secondly, people can drill a new well in the safe aquifers.”

Due in part to the fact that climate change is creating a global shortage of potable water, finding an alternative safe, clean source is not always an option. If this is the case, a bio-sand filter can be installed to help remove arsenic particles or other sediments and pathogens from the water supply. Installation of the filters is one of the many initiatives supported by UNICEF to reduce the effects of arsenic contamination in Nepal.

Story adapted from Diluting the Pain of Arsenic Poisoning in Nepal found at http://www.unicef.org/infobycountry/nepal_35975.html.

Climate Change Connection

Like carbon, there are trace amounts of arsenic in all living matter. “Arsenic may enter lakes, rivers or underground water naturally, when mineral deposits or rocks containing arsenic dissolve. Arsenic may also get into water through the discharge of industrial wastes and by the deposit of arsenic particles in dust, or dissolved in rain or snow.”¹

Human activities that can add arsenic to our water are the same activities that are contributing to climate change and include burning fossil fuels; mining metals such as gold; using pesticides in agriculture and burning waste.

Your task!

Create a one-minute public service announcement or radio jingle to promote the purchase and use of bio-sand filters so children will have clean water. First, research bio-sand filters further by using the Internet to search “bio-sand filters.”

NOTES

1. Health Canada, “Arsenic in Drinking Water,” <http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/arsenic-eng.php> (accessed May 2009).

Student Handout #25

UNICEF BASIC FAMILY WATER KITS

In Yemen in 2008, thousands of people were affected by a tropical storm and the flooding that followed. Lives were lost and extensive damage to homes, crops and livestock were witnessed. UNICEF estimated that 68 people are dead and nearly 3,300 households were destroyed in the floods. About 25,000 people have been forced to take refuge in shelters.

UNICEF and its partners were there with emergency aid. As water is essential to human existence, the aid included basic family water kits (items included buckets, soap, towels and purification tablets).

UNICEF representative Aboudou Karimou Adjibadé attributed the rare storm to the effects of climate change. He said this region of Yemen is not accustomed to flooding so many of the homes are made of mud and literally washed away in the flooding. "This kind of tropical storm has not hit Yemen for almost 600 years. It is something very unusual," he said.

Story adapted from <http://www.unicefusa.org/news/news-from-the-field/tens-of-thousands-displaced.html>.

Climate Change Connection

The impact of climate change, is droughts, floods, storms, temperature changes and weather pattern changes. There is increasing evidence of changes in the climate system resulting in an increase in the frequency and severity of natural disasters. This, in turn, will put added pressure on the global supplies of clean, safe drinking water.

UNICEF needs our support to supply clean water in times of natural disasters. With a donation of \$100, you allow UNICEF to distribute a basic family water kit for ten households, with detergent, soap, wash basin, towels, bucket and water purification tablets.

Your task!

Create a one-minute public service announcement or radio jingle to promote the purchase of UNICEF's basic family water kits so children will have clean water.



A boy in the Maldives carries collapsible water containers, which are included in UNICEF basic family water kits. UNICEF has distributed thousands of kits to tsunami-affected families.

Student Handout #26

WATER RUN CLEAN

Sketch your filter design. Provide dimensions and label the materials' striations.

Instructions for testing

1. Prior to filtering

- Collect 250ml of muddy (contaminated) water. Stir well.
- Observe colour, clarity and odour of the water. Record your descriptions in the chart below.
- Measure the TDS of the water and record in the chart below.

2. Pour your contaminated water into your filter.

- Record how long it takes to completely filter.
- Observe colour, clarity and odour. Record your results.
- Measure the TDS of the water and record your results.

Water volume	Filtration Time (ml)	(in seconds)	Description of water sample			
			Colour	Clarity	Smell	TDS ppm
Water sample prior to filtering	250ml	0				
Water sample after filtering						

ENERGY



Cape Verde, 2008

Wind turbines generate electricity in the mountains of Praia, the capital of Santiago Island.

INTRODUCTION

Energy is vital to sustain our lives. We use energy in every aspect of our lives; growing, transporting food and cooking it, heating or cooling our homes, for light, in manufacturing and for powering our cars.

Currently most of the world's energy is from fossil fuels: coal, gas and oil. Burning of fossil fuels not only creates carbon dioxide, but affects our air quality and exacerbates climate change.

This effect particularly impacts children, and those most vulnerable are in developing countries. Youth in Canada are also affected; issues of asthma and breathing disorders are on the rise and quality of life is compromised.

Children have the right to clean air, and the good news is we can use renewable energy sources to help reduce our dependence on fossil fuels. We can start by understanding the issues and then doing our part to make a difference.

ACTIVITIES

The curricula links below are addressed in this theme. For an extensive list of relevant provincial expectations/outcomes, refer to Appendices G and H: Curriculum Links on pages 142 and 146, and Appendix I for links in Alberta, Saskatchewan, Manitoba and Quebec.

Province	Course	Expectation/Learning Outcome
Ontario	SVN3M Environmental Science, Grade 11, University/College Preparation <i>Conservation of Energy</i>	F1. assess the impact on society and the environment of the use of various renewable and non-renewable energy sources, and propose a plan to reduce energy consumption; F3. demonstrate an understanding of energy production, consumption, and conservation with respect to a variety of renewable and non-renewable sources.
Ontario	SNC1P Science 9 Applied <i>Physics</i>	E1. assess the major social, economic, and environmental costs and benefits of using electrical energy, distinguishing between renewable and non-renewable sources and propose a plan of action to reduce energy costs.
British Columbia	Science 9 <i>Physical Science: Characteristics of Electricity</i>	Relate electrical energy to power consumption.
British Columbia	Sustainable Resources 11	Describe the processes associated with the generation and use of energy resources.

Setting the Stage

Objective: Students discuss viable renewable energy sources.

Time: 15 minutes

Materials

- Renewable Energy Cards (optional)
- Renewable Energy Defined answer key
- Appendix E: Reflect and Act (page 139)

ACTIVITY

1. Distribute Appendix E: Reflect and Act (page 139) to each student and ask them to journal lessons learned during discussion and activities around the theme.
2. Arrange the class into six groups. Give each group a set of the Renewable Energy Cards. If the students have basic knowledge of the different renewable energy sources, play this game without the cards, or list of the answers.
3. Read to the class the first definition (only) from the Renewable Energy Defined answer key. Each group is to decide what renewable energy source matches the definition, and choose a renewable energy card from their deck. Once that card is played (or the answer is recorded if you did not use the cards), that card or answer cannot be used again.
4. Discuss the answers. You might want to discuss the advantages and disadvantages of each.

Nim Dolma is 18 and a grade 4 dropout because her parents could no longer afford her education. Today she is back at school thanks to the Non-Formal Education Programme (NFE), established by the government of Bhutan in 1992 with the support of UNICEF.

Classes are held in the evenings to accommodate students who have to work during the day, like Nim who is very busy collecting bamboo, weaving blankets, etc. during the day. In the evenings it is dark outside; since there is no electricity in the school, solar lanterns light the classrooms at Sakten Primary School. For more information see <http://www.unicef.org>.

Renewable Energy Defined

ANSWER KEY

Renewable Energy Source	Definition
Wind	This energy source works well in places like Kingston, Ontario. This source emits no carbon dioxide. We have an unlimited supply, and it works if set up on a flat expanse with no barriers in its way.
Geothermal	This energy source uses the heat from the interior of the earth.
Solar	This energy source uses a certain radiation. This source is extremely powerful and a perpetual resource.
Heat recovery	This energy source collects the warmth from sewer waste, drainwater, landfills and ventilation air.
Biomass	This energy source is an organic material that can be burned or converted to other energy forms like methane gas or transportation fuels.
Water from rivers and dams	The energy from this source is captured falling from a vertical distance. The higher the fall, the greater potential for energy.
Off shore tidal	The energy from this source harnesses the power of the ocean. This is a large underwater 'farm' remote from the shoreline.
Hydrogen	A colorless, highly flammable gaseous element, the lightest of all gases and the most abundant element in the universe, used in the production of synthetic ammonia and methanol, and in petroleum refining.

RENEWABLE ENERGY CARDS

Wind	Biomass
Geothermal	Rivers and dams
Solar	Off shore tidal
Heat recovery	Hydrogen

Solar Café

Objective: To learn about and construct a simple solar oven and discover how using solar technology helps in the fight against climate change.

Time: 60 minutes (or longer)

Materials

- A reflective accordion-folding car sunshade (6)
- A cake rack (or wire frame or grill) (6)
- 12 cm (4 ½ in.) of Velcro
- Black pot (6)
- Bucket or plastic wastebasket (6)
- A plastic baking bag (6)
- Scissors (6)
- Needle and thread (6)

According to the World Health Organization, in 23 countries, more than 10% of deaths are due to two environmental risk factors: unsafe water and indoor air pollution due to solid fuel use for cooking. Around the world, children under five are the main victims and make up 74% of these deaths. For more information see <http://www.who.int/indoorair/publications/indoor-air-national-burden-estimate-revised.pdf>.

ACTIVITY

1. Arrange the class into six groups.
2. Brainstorm with the class ways in which people who cook creating indoor pollution can develop a healthier way to cook.
3. Explain that one solution is a solar oven, which cooks food using only the power of the sun. Tell students that they will work together to build solar ovens. GreenLearning has a good backgrounder on solar heat at <http://www.re-energy.ca/docs/solar-heat-bg.pdf>.
4. Here are the instructions written by Kathy Dahl-Bredine from Oaxaca, Mexico or, you can visit http://solarcooking.wikia.com/wiki/Kathy_dahl-Bredine or Solar Cookers International at <http://solarcookers.org/> for more details:

- Lay the sunshade out with the notched side toward you.
- Cut the Velcro into three pieces, each about 4 cm long.
- Hand sew one half of each piece, evenly spaced, onto the edge to the left of the notch; sew the matching half of each piece onto the underneath side to the right of the notch, so that they fit together when the two sides are brought together to form a funnel.
- Press the Velcro pieces together, and set the funnel on top of a bucket or a round or rectangular plastic wastebasket.
- Place a black pot on top of a square cake rack placed inside a plastic baking bag. A standard size rack in the U.S. is 25 cm (10 in.). This is placed inside the funnel, so that the rack rests on the top edges of the bucket or wastebasket. Since the sunshade material is soft and flexible, the rack is necessary to support the pot. It also allows the sun's rays to shine down under the pot and reflect on all sides. If such a rack is not available, a wire

If you want to add a challenge to the solar oven construction, you might want to give the students the supplies only, with no directions. The group must work together and construct an oven that works. This is best done on a sunny day so groups can test the oven.

The other option is to give students a project to research solar ovens, draft plans and construct the oven. You could make it into a solar challenge with the winning group being the first to bring water to a certain temperature.

frame could be made to work as well. Note: the flexible material will squash down around the sides of the rack.

- The funnel can be tilted in the direction of the sun.

5. If there is time, share other examples of solar ovens:

- GreenLearning has background information and instructions on how to build your own solar oven - <http://www.re-energy.ca/docs/solaroven-cp.pdf>
- PBS — Nova Teachers has detailed plans, with follow-up resources, on how to build a sophisticated solar oven at http://www.pbs.org/wgbh/nova/teachers/activities/3406_solar.html#materials.
- Try to construct an oven from a pizza box and aluminum foil.

Keep the discussion going

Besides reducing indoor air pollution, why else would people want a solar oven?

Using solar power eliminates the need for fossil fuels. Also, in some countries it is a matter of personal safety. In Darfur, for example, women who have solar ovens don't need to leave the camp to collect firewood, helping keep them safe from attack.

How can we further use solar power in every part of the world to lessen the effects of climate change on children?

Solar water pumps help with water collection from wells. Learn about Somali villages investing in solar-powered pumps at http://www.unicef.org/wash/somalia_44827.html.



YOUTH TAKE ACTION

Challenge for Change!

Distribute Student Handout #27: Youth Take Action (page 112) and discuss the inspirational profiles. Instruct students (groups, pairs or individuals) to select ONE student project listed under the Challenge for Change Action, or invite them to create their own challenge. Set appropriate timelines and criteria. Evaluate each project using Appendix C: Culminating Task Rubric on page 137.

BACKGROUND ENERGY

What are the issues?

The world's primary source of energy is fossil fuels. Not only are they a finite fuel source (non-renewable), but using fossil fuels also creates carbon dioxide, a major contributor to climate change. As we cut down trees faster than they can replenish in many parts of the world, we are also losing the valuable carbon sinks to store the excess CO₂ created when we burn fossil fuels.

Energy facts in developing countries:

- The burning of fossil fuels is accelerating climate change.
- 80% of the population that has no access to electricity lives in developing countries, mainly in South Asia and sub-Saharan Africa.¹
- Many people in developing countries do not have electricity.
- It is estimated that currently 1.6 billion people do not have access to electricity, and 2.4 billion people are lacking the modern fuels necessary for cooking and heating their homes safely.
- More than 3 billion people must use wood, crop waste and/or dung to cook with and heat their homes. One of the immediate issues related to these energy sources is that they produce large quantities of smoke inside buildings, which contributes to the deaths of 800,000 children annually, due to their immature respiratory systems. In addition to the health effects of these energy choices, communities are affected on a long-term basis by the fact that their local resources and natural environment are being degraded.²



Renewable solutions

We need to find ways to provide people in developing countries (and developed countries) with renewable energy sources such as wind, solar, biomass, geothermal, etc. instead of burning solid fuels. Not only would the immediate concerns of air pollution and associated health issues be eliminated, but the planet would also benefit from the reduction in carbon being released into the atmosphere. We need to end our world dependency on fossil fuels and this is starting to happen in parts of the world. For instance, China has programs to support affordable solar energy to pump water, produce electricity and heat water. The government is also promoting household biogas plants to treat human excreta.³

"Yes, I do agree that trees shouldn't be cut down unnecessarily, but we should think about those people who have to cut down trees so that they may survive. The major cause of excess tree abuse is the cutting of trees for fuel. People around the world lack basic necessities such as fuel and need to chop down trees if they want heat and warmth. Every government needs to make an effort in providing alternative resources for our mission to succeed." Amre, age 18, Somalia⁴

To learn more about climate change connected to energy, view the UNICEF UK Climate Change Report 2008: *Our climate, our children, our responsibility* at <http://www.unicef.org.uk/Documents/Publications/climate-change.pdf>

NOTES

1. UNICEF UK, *Our climate, our children, our responsibility*, 2008, p. 17.
2. Ibid.
3. Ibid.
4. Ibid.

Student Handout #27

YOUTH TAKE ACTION

Challenge for Change action items

Be part of the solution! Complete ONE project from the list below or create your own! You will be evaluated on criteria including knowledge of the issue, expression of ideas and connections made between personal, local and global views of the issue.

People-powered transit is the most environmentally friendly way to travel! If we can walk, run, or bike to our places of destination, we drastically reduce the use of fossil fuels in our lives.

PROJECT: Organize a commuter challenge for both students and teachers with a Bike to School Day in May (or any other time of year)! Make it a fun event with refreshments for all the cyclists. Look into having a lunch demonstration of music and/or bike tricks.

Youth need to spread the message on how to get our planet out of our energy crisis.

PROJECT: Partner with an elementary school in your area. Develop a 'Save Energy' board game or storybook and share this with the elementary students.

Research solar ovens that can be purchased and distributed to places in the world that primarily cook indoors using fossil fuels. Check out <http://www.solarovens.org/> to learn more.

PROJECT: Get your school involved in a fundraiser to sponsor a family for a solar oven, or organize a Solar Oven Cook-Off at the school. Teams enter their solar oven design and have to cook a simple recipe. The judges decide on the best solar meal!

King David secondary school, Vancouver, BC

Students at King David Secondary School have raised money to support The Solar Cooker Project, which supplies solar ovens to women in Darfur, a region of Sudan. The ovens allow women to stay close to their families to prepare meals instead of leaving the camp to collect firewood for cooking. Leaving the camp can result in danger to women and children in this area of the world. For more information see <http://www.jewishworldwatch.org>.

Mount Kilimanjaro, Tanzania

Ten amazing youth from impoverished urban centres in Kenya, Tanzania and Ghana will soon be challenged even further! They will join a team that will attempt to climb Mount Kilimanjaro. The purpose of this adventure is to draw attention to the global effects of climate change due to our dependency on fossil fuels and how it can devastate urban centres as it deals with increased population, unemployment, and unacceptable health care systems. For more information see <http://www.un.org>.

REFLECT. ADAPT. MITIGATE.

UN Climate Change Conference

Objective: To explain the varying political responses by governments in approaching global environmental issues

Time: 2 days

Materials:

- One copy of Student Handout #28: Expert Team Preparation per expert group.
- One copy of Student Handout #28: UN Climate Change Conference Assignment per country group. Fill in the assigned countries. Consider assigning countries like: China, USA, Canada, Brazil, Russia, India, Bangladesh, Denmark and Iceland.
- One copy of Handout #30: Peer Assessment Rubric per student.

ACTIVITY

Expert Panels:

1. Organize the class into “expert groups” of (preferably three to four) students per topic:
 - a. Team 1: Climate Change Basics
 - b. Team 2: Effects of Climate Change
 - c. Team 3: Taking Action on Climate Change (Industry/National/International level)
 - d. Team 4: Taking Action on Climate Change (Personal/Community/Organization level)
 - e. For large classes, have more than one team exploring the same topic.
2. Explain that each group has been asked to join their country’s delegation to the next Climate Change Summit or related event. Discuss the UN Conference of the Parties. Research the *UN Conference of the Parties No. 15* to inform your discussion. (**Optional extension:** Have students research the history and discussions of all the UN Conferences of the Parties to broaden their understanding on the subject.)
3. Before they leave for the summit, each expert group will need to brush up on their area of expertise. Have each expert group explore an aspect of climate change. Hand out one *Expert Team Preparation* to each team and one *Peer Assessment Rubric* to each student.
4. Have teams read their assignments and peer assessment forms and ask any relevant questions.
5. Teams conduct research and discuss findings together, and ensure that everyone has an equal understanding of the topic. Teams will be responsible for recording all they have learned and should devise a way to record their findings and share with all team members.
6. When the research is complete, have students each fill in one *Peer Assessment*. Teams are then reorganized so that new groups are formed with one expert on each topic in each group. (Be careful in instances where you had more than one team studying the same topic.)

Country Position Presentations:

1. With the new groups formed, explain that each group represents a different country. Hand out one *Climate Change Conference Assignment* to each country group. Review the steps of the assignment. Answer any questions about the assignment.
2. Students conduct their research and work together to prepare their Country Presentation. These presentations should be five to seven minutes in length. Encourage students to use creativity when preparing their presentation and imagine themselves as that country's delegation. Highlight the importance of perspective and point-of-view.
3. On Conference day, invite students to dress professionally and act the part. Enhance the experience by focusing on details like: using the school gym or auditorium to host the Conference, having linen-covered tables of beverages and snacks, providing team placards and individual name cards that identify their area of expertise, and flags to represent each country. Make the experience formal to add to the excitement! Students could also invite local media to attend the event, to get their message out.
4. As chair of the Conference, welcome the leaders and delegates. Alternatively you could increase student participation by, or holding a student vote to elect the chair of the conference. . Conduct the five to seven minute presentations from each country. Ask groups to keep note of any questions or points of rebuttal that arise for them. When all presentations are complete, open the floor for a question and discussion period. Act as a moderator to encourage all groups to participate. Have students volunteer to record major points of interest up at the front for all to see.
5. Adjourn for the day at this point so that you can draft a statement that does its best to represent the discussions of the day and puts forth recommendations for moving forward on climate change. This statement will act as a basis for discussion when you reconvene.
6. When you reconvene, have countries debate and discuss your proposed statement. Prompt debate with the following questions:
 - a. Which parts of the statement accurately reflect your country positions on climate change?
 - b. Which parts do you wish to amend or change? Why?
 - c. Can your country accept this statement and sign an agreement based on it? Why or why not?
7. At the conclusion of the Conference, when a statement has been adjusted and agreed upon, have a mock signing where countries that are comfortable with the statement agree to formalize it by signing on. Have some students take photos of this as it happens. Make it fun and dramatic!
8. Evaluate student understanding of climate change, its effects and possible actions and solutions in addition to presentation and organizational skills using the rubric in Appendix C as a guide.

See tips on public speaking, country profiles, and drafting position papers from model UN conference websites:

<http://www.unac.org/modelun/>

<http://www.cahsmun.org/index.html>

<http://www.unausa.org/global-classrooms-model-un/how-to-participate/model-un-preparation>

Keep the Discussion Going

Have students write news articles about the results of the Conference of the Parties. Use the photos taken that day to supplement the articles. Submit the articles to local newspapers or to the school board newsletter.

Have students write letters to government leaders, including the recommendations and suggestions that came out of this event.

What Can We Do?

Objectives: By the end of this activity participants will be able to:

1. Present strategies to encourage and increase mitigation
2. Name some of the main stakeholders responsible for the implementation of actions and policies aimed at increasing mitigation
3. Explain how they and young people in general can become active and support mitigation

Time: 1 hour

Materials:

- Flipchart and markers
- Post-its
- Paper and pens
- Movie clip: *Lessons Save Lives: the Story of Tilly Smith*
<http://www.youtube.com/watch?v=E0yrONL1Q3g>

ACTIVITY

1. Ask students by a show of hands, whether they feel they can help in addressing climate change. Ask students to explain their responses. View the movie clip *Lessons Save Lives*, as an example of how they can make a difference. Prior to viewing the clip, ask students to think about a quality that Tilly exemplified which enabled her to make a difference.
2. After viewing the clip, debrief with the students, and ask them again, whether the clip inspired them to believe they can make a change.
3. Remind students that the effects of climate change are stronger in some parts of the world, mainly in developing countries that already face other problems (poverty, hunger, HIV/AIDS, etc.). This is not “fair”, but it is the reality. However, people in industrialized countries can do something about this, and the key work is “mitigation” (taking action to reduce greenhouse gas emissions. It is about transforming the way that individuals, governments and industry produce and use energy, changing activities to reduce or eliminate emissions and developing clean and efficient infrastructure where it does not currently exist.)
4. Brainstorm all possible strategies that could be implemented to increase mitigation in your country. List them on the flipchart until you have about 10 suggestions from participants.
5. Draw a six-level “responsibilities socio-ecological model” on another flipchart (see appendix for an

example of the model) and name each level: you / family / school / local community / national government / international. Explain that this represents the different levels of responsibility to implement the different actions.

6. Explain to participants that for each of the suggested actions, they shall now identify one/several actors who can be responsible for its implementation at different (one or more) levels of the model. Tell them that they might find that some of the actions could be implemented by different actors at different levels/settings. For instance, if the suggested action is “save water”, something can be done at each level of the model: by yourself by lowering your consumption (YOU level), by other members of your family at home (FAMILY level), by the school by deciding to change broken taps or issue new water-use rules (SCHOOL level), at the LOCAL COMMUNITY level and at the NATIONAL GOVERNMENT level, which might, for instance, issue a new law. Do one or two examples all together.
7. Form small groups of two or three. Randomly distribute the actions suggested at the beginning of the activity to the different groups. Give them a few minutes to discuss and figure out which actors(s) they think should be responsible for the implementation of each action, at which level/setting and what they could do. Then, ask each group to note their ideas on Post-its (next to the action) and stick them on the right spot in the responsibility scheme, providing an explanation.
8. Now that they have an overview of the different levels of responsibilities, ask the groups if they have any new ideas for actions. Add these to the scheme.
9. Ask the groups if and how they, as young people, could contribute to making these actions implemented by the different actors identified. Of course, some actions clearly concern them directly (those in the “you” level), but what can young people do to get action implemented at the community or even national levels? The key word here is “advocacy”, that is, exerting pressure to bring those actors to implement these actions. How? Brainstorm advocacy strategies (ex. campaigns, public debates, awareness-raising actions, etc.). Note those down on the flipchart.

Keep the Discussion Going:

Ask participants what they learned in this activity. Did they know that young people could do so much? Would they feel ready to undertake actions, or to change some of their habits? Do they think that it would be easy/difficult? Why?

RESPONSIBILITIES SCHEME (SOCIO-ECOLOGICAL MODEL):



Climate Superheroes

Objectives: By the end of the activity participants will be able to:

- Explain that action towards more mitigation can be supported by different stakeholders with complementary roles
- Present the role and possible action of (at least) three of those stakeholders.

Time: 1 hour

Material:

- Flipchart and markers
- Character cards (see Appendix)

ACTIVITY

1. Introduce the activity by asking the group who are the people or institutions that are important for combating climate change, and why (e.g. politicians/authorities; the media; the school; associations; etc).
2. Tell the group that in this activity they are going to interview potential candidates to join the “Climate Change Superhero Dream Trio”. The entire group will be the interview panel. Present the candidates, making sure that everyone is familiar with their usual activities.
3. Form eight small groups. Give each group a character card (one copy per participant). Explain that they will be that character and will have to convince the interview panel (the rest of the group) why they should get to join the Climate Change Superhero Dream Trio.
4. Give them a few minutes to read through their character cards individually and then invite groups to have a discussion about why their character is essential for combating climate change. Tell them that they should prepare a two-minute speech or presentation to convince the interview panel. (Give them 10 minutes to prepare this.)
5. When everyone is ready, get the group together and give each character group two minutes to convince the interview panel why they should be on the trio. (Only three places are available!)
6. When everyone has had a go, get the groups to vote on the three characters who they think should be in the trio. (They can’t vote for their own character.)
7. When the trio is sorted out, split the group in three (one per superhero), and ask each group to come up with a list of actions that their superhero could initiate to combat climate change. Give 5 to 10 minutes for this and then let each group report back and conclude the activity with the debriefing discussion.

Keep the Discussion Going

Ask the group how they found this activity. Was it easy/difficult to play the role of someone else? Did they learn anything from this activity?

Do they think that the three superheroes could combat climate change alone? What/who else is needed to succeed at this big challenge? What about the other characters?

Explain that in order to combat climate change, everyone must act, and that there are many things that can be done depending on who you are and what your position/job is, but that if we want to achieve something, action is needed by every single person!

Debating the Route to Sustainability

Objectives: By the end of this activity participants will be able to:

1. Formulate and present strong arguments in support of a particular viewpoint
2. Assess the impact of human activities on the sustainability of ecosystems, and evaluate the effectiveness of courses of action intended to remedy or mitigate negative impact
3. Assess environmental challenges facing Canadians
4. Debate the concept of sustainability

Time: 2 days

Materials:

- Flipchart and markers
- Paper and pens
- Student Handout 32 – Initial Argument Handout, page 127
- Student Handout 33 – Argument Package Handout, page 128
- Research tools: computer, laptop, tablet, smart phone, and/or library
- Video clip about the causes of global warming: <http://video.about.com/environment/What-Are-Causes-of-Global-Warming.htm> (1 min 58sec)

ACTIVITY

1. Ask participants to explain the various ways that people can work to combat climate change and other issues related to environmental sustainability. In order to guide discussion toward the debate topic, have participants view the video clip about the causes of global warming.
2. After viewing the clip, debrief with participants, ask them if they thought of any new ideas related to the topics discussed in the video.
3. Remind participants of the two overarching themes of environmental sustainability discussed in previous lessons; namely, individual activism and the development of renewable energy technologies. Be sure to explain that for the purpose of this activity, the participants will be made to choose one course of action to advocate for. However, it is important to remember that the two actions should work together rather than apart to combat climate change.
4. Record the debate question on the flipchart: *What do you think should be the main focus of environmental sustainability, developing and implementing large-scale green energy technologies or individual activism?* Explain that participants will choose one course of action to advocate for and that they will be placed into small groups (groups of 3) according to their chosen viewpoint.
5. Separate participants into groups and provide each group with an initial argument handout.

6. Instruct participants to use the initial argument handout to construct three affirmative arguments (arguments supporting their position rather than negating the opposition). For each argument the participants must include a justification explaining *why* the argument is true and *why* the argument is important.
7. Once participants have finished formulating their 3 initial arguments, adjourn for the day. Explain that the next step will be to present their arguments to the other small groups advocating a similar viewpoint.
8. Begin by separating the class into 2 large groups according to which viewpoint they have chosen to advocate. Explain that everyone should present their arguments from the previous lesson to their group. Once all of the arguments have been presented, the group should choose three arguments that they will use in tomorrow's debate.
9. Provide both groups with a copy of the argument package handout. Explain that they are to expand and refine their chosen affirmative arguments. In addition, explain that they are meant to complete their argument package by anticipating their opposition's logic and formulate at least 3 defensive arguments. Remind the participants that they should strengthen their arguments with facts and calculations.
10. Explain that you will be acting as the moderator of the debate and that you will instruct each side when it is their turn to speak. Remind participants that they must uphold debate decorum and therefore should keep all ideas and comments to themselves until the moderator has called on them. Once the format has been explained, begin the debate.

Keep the Discussion Going:

Ask participants what they learned from this activity. Was their opinion solidified or altered by the debate? Could they identify which arguments were the strongest? What characteristics made specific arguments stand out as being strong? Do they truly believe one course of action is more reasonable or important than the others? How do they think the two courses of action can work in tandem to combat climate change?

Student Handout #28

EXPERT TEAM PREPARATION

Develop your expertise on the effects of climate change

Some questions to help focus your research:

- How does global warming affect species and their natural habitats?
- How does global warming affect weather patterns?
- How will human food security be affected by global warming?
- Why are the world's poor (particularly children) most vulnerable to the effects of climate change?
- What has been the history of climate change science up until now?

A few places to start looking for answers:

- UNICEF Report: Our children, our climate, our responsibility
<http://www.unicef.org.uk/Documents/Publications/climate-change.pdf>
- CBC – Climate Change www.cbc.ca/news/background/climatechange/
- WWF Climate, Carbon and Energy http://panda.org/what_we_do/footprint/climate_carbon_energy/

Develop your expertise on the basics of climate change

Some questions to help focus your research:

- What is climate change? What is global warming?
- What are greenhouse gases (GHGs)? What are fossil fuels?
- What is the greenhouse effect? What are carbon sinks?
- What evidence supports the idea that humans are causing global climate change?
- What has been the history of climate change science up until now?

A few places to start looking for answers:

- Carbon Sinks, FERN <http://www.fern.org/pages/climate/carbon.html>
- UN Framework Convention on Climate Change <http://unfccc.int/2860.php>
- BBC – Climate Change <http://www.bbc.co.uk/sn/hottopics/climatechange/>

Develop your expertise on taking action on climate change (industry/national/international levels)

Focus your research on answering these questions:

- What are some examples of companies taking steps to reduce their greenhouse gas emissions?
- What is the Kyoto Protocol? What have countries committed to under it?
- What is the Conference of the Parties No. 15? What is the history leading up to this meeting?
- What are some examples of programs that national governments are finding successful for reducing greenhouse gas emissions? Which countries are undertaking them?

A few places to start looking for answers:

- UN Framework Convention on Climate Change <http://unfccc.int/2860.php>

- The NEW Climate Deal: A pocket guide
www.ourplanet.com/imqversn/WWF_climate_guide/WWF_Climate_Deal.pdf

Develop your expertise on taking action on climate change (personal/community/organizational levels)

Focus your research on answering these questions:

- What can people do at a personal level to reduce greenhouse gas emissions? Does it really help?
- What innovative steps are communities and cities taking to reduce greenhouse gas emissions?
- How are climate change organizations motivating others to tackle climate change?
- What are some examples of youth-led initiatives to tackle climate change?

A few places to start looking for answers:

- [UNICEF](http://voicesofyouth.org/) Voices of Youth: <http://voicesofyouth.org/>
- Climate Change: Take Action Now! A guide to supporting the local actions of children and young people, with special emphasis on girls and young women:
http://www.ifrc.org/Global/Publications/youth/AYCEOs_climate-change_take-action-now_EN.pdf
- Climate Change, and Child Rights Education Kit: <http://www.unicef.ca/en/teachers/article/climate-change-and-children%E2%80%99s-rights>
- Climate Change Youth Guide to Action, Taking It Global:
<http://www.takingitglobal.org/action/guide/>

Student Handout #29

UNITED NATIONS CLIMATE CHANGE CONFERENCE ASSIGNMENT

Congratulations! You have all been chosen as experts in your field, to form _____'s (country) delegation to the Climate Change Conference of the Parties this year.

This climate change conference will be the most important yet, and your expertise will be crucial in representing the interests of _____ (country) at this high-level meeting.

The Conference of the Parties is being held on _____. (date) Your meals, accommodations and travel have all been arranged.

We appreciate your effort in this phase as you prepare together to address the agenda (below) as representatives of _____. (country)

All the best in your preparation,

Chair of the UN Climate Change Conference of the Parties

Conference of the Parties Agenda

1. Country presentations (each five to seven minutes in length)
2. Question period, rebuttal, discussion among countries
3. Agreement/statement drafted and discussed
4. Signing of agreement

Your task:

Prepare a five to seven minute presentation that communicates:

- Your country's position on recent climate change protocols and flexible mechanisms
- Your country's recommendations for addressing climate change
- Commitments your country is willing to make

Student Handout #30

PEER ASSESSMENT RUBRIC

Peer Assessment Criteria	Student Names
Put each group member's name in a column (include yourself). For each criteria below—give a mark out of 4. 4— <u>Always</u> demonstrates the quality 3— <u>Frequently</u> demonstrates the quality 2— <u>Sometimes</u> demonstrates the quality 1— <u>Rarely</u> demonstrates the quality	
Contributes to group planning, discussion, and decision-making.	
Conducts thorough research and uses reliable sources.	
Produces high quality work.	
Contributes creative ideas with a positive attitude.	
Works with others and is willing to compromise.	
Was a valuable member of the team overall.	
TOTAL (/ 25)	

Student Handout #31

CHARACTER CARDS

<p>JOURNALISTS</p> <p>You can help uncover the real situation and tell others! You can keep the pressure on governments and scientists by reporting on progress. You can also tell the world about communities already affected by climate change and highlight where support and assistance is needed.</p> <p>BUT – People could ignore what you say, or the newspaper you work for might not be interested in printing stories about climate change. There might not be enough people who will read what you write.</p>	<p>YOUNG PEOPLE AND COMMUNITIES</p> <p>You can reduce your carbon impact by making changes in the way you live. You can keep pressure on businesses and governments to make sure they are doing everything in their power to reduce their carbon footprint in your country. You can also campaign or raise money to ensure that communities around the world are given the support they need to deal with the effects of climate change.</p> <p>BUT – You need time, commitment and perseverance. And everyone might not be interested.</p>
<p>POLITICIANS</p> <p>You have the power to make important decisions and laws that can limit the amount of carbon that businesses are allowed to produce. You can make sure any cars in your country are fuel-efficient. You can invest money to support scientists to innovate and come up with new green technology.</p> <p>BUT – Your elections are coming up and you don't want to make any changes that will make you unpopular (like charging people more to fly by aeroplane). You want to stay in power. And, even without your elections looming, there may be a lack of public support for bold decisions!</p>	<p>SCIENTISTS</p> <p>You can make new discoveries and invent new ways of making energy that produce no carbon. Your inventions could revolutionise the world. You could also come up with things that will help communities already affected by climate change deal with their situation.</p> <p>BUT – You rely on funding from governments and businesses, and you can only explore the things they ask you to. Plus your inventions will take years to develop and will need to be tested before they can be produced.</p>
<p>BUSINESS LEADERS</p> <p>You have great power to make changes. If you are a car manufacturer you could make sure all your cars are fuel-efficient. Or if you are an electricity company you could build wind farms instead of coal-powered generators. This would have a massive impact on climate change!</p> <p>BUT – You have to make as much money as possible for your shareholders, or else you will lose your job.</p>	<p>CAMPAIGNERS AND ACTIVISTS</p> <p>You can research what governments and businesses are doing to address climate change, and you can campaign and lobby for them to do more. You can encourage communities to get involved – and give them the tools to contact their MPs to keep the pressure on governments to make important decisions on climate change.</p> <p>BUT – You have very little money to support your efforts. People might not listen to you. You might be going up against very wealthy and powerful people.</p>

<p>NGO WORKERS IN COUNTRIES AFFECTED BY CLIMATE CHANGE</p> <p>You can help the communities already facing the devastating effects of climate change. You can provide mosquito nets and training for people who aren't used to dealing with malaria. You can support communities in finding solutions to water and food shortages. You can also use your influence to lobby governments and businesses to cut carbon emissions.</p> <p>BUT – There are so many problems you are already dealing with, such as supporting efforts against poverty and HIV. And you only have a limited amount of money and just a few staff members. You get funding from individual donations, businesses and governments, none of which is guaranteed to continue at the same levels.</p>	<p>TEACHERS</p> <p>You can inform your students about climate change and its impact on children around the world. You can discuss with them about strategies to reduce their carbon footprint as well as their families' footprints. You can also inform your colleagues and the school staff about how to reduce your school's carbon footprint.</p> <p>BUT – You only have a little time to work on these topics, as you have to follow a teaching program with very little room and time for extra topics.</p>
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Student Handout #32

ARGUMENT PACKAGE HANDOUT

Formulate 3 affirmative arguments and record them below. Be sure to identify why each argument is *true* and *important*.

AFFIRMATIVE ARGUMENTS	
Proposed course of action:	
Argument One	
Argument Two	
Argument Three	

ARGUMENT ONE	
Why is it true?	
Why is it important?	
ARGUMENT TWO	
Why is it true?	
Why is it important?	
ARGUMENT THREE	
Why is it true?	
Why is it important?	

Student Handout #33

ARGUMENT PACKAGE HANDOUT

Formulate 3 affirmative arguments and 3 negative arguments and record them below. Be sure to include facts and calculations as evidence.

AFFIRMATIVE ARGUMENTS (OFFENSIVE)	
Argument One	
Argument Two	
Argument Three	

NEGATIVE ARGUMENTS (DEFENSIVE)	
Argument One	
Argument Two	
Argument Three	

FURTHER RESOURCES

Advocacy Guide presented by the World Health Organization highlights the decade between 2005 and 2015 as critical years to focus global attention on water. This guide shares ways we can demonstrate our personal commitment to organizing events around World Water Day (WWD), so that we can ensure that everyone is aware of the urgency of the goals to be achieved between 2005 and 2015.

http://www.who.int/water_sanitation_health/en/2005advocacyguide.pdf

Association for Canadian educational resources (ACER) offers a program that enables students, clubs, groups, or individuals to accurately collect data to monitor tree growth.

<http://acer-acre.ca/resources/resources-for-teachers>

Campus Climate Challenge is the largest youth mobilization to stop global warming. This international effort is taking place on more than 600 campuses in the US and Canada. Through the Challenge, youth are leading the world toward clean energy solutions. Students are working to transform their campuses into models of sustainability by passing climate neutrality, efficiency, transportation, green building and clean energy policies.

<http://ssc.sierraclub.org/get-involved/campaigns/index.html>

CarboSchools is a European Union-based program that connects climate change researchers with secondary school teachers.

<http://www.carboeurope.org/education/>

ClimateChange.org unites 42 organizations and over 629 local groups in 56 states and provinces. Together, they have passed hundreds of local and regional climate policies.

<http://www.climatechallenge.org/>

Climate Change Adaptation and Disaster Risk Reduction in the Education Sector provides guidance on policy and planning for sustainable development throughout the education sector in both non-formal and formal learning places at all levels of action, from national to local.

[http://www.unicef.org/education/files/UNICEF-ClimateChange-ResourceManual-lores-c\(1\).pdf](http://www.unicef.org/education/files/UNICEF-ClimateChange-ResourceManual-lores-c(1).pdf)

Climate Change and Environmental Education (UNICEF Canada) explores the impact of climate change basic education and gender equality.

http://www.unicef.org/education/bege_61668.html

Climate Change: Connections and solutions

Download this 2-week unit for grades 9-12 from the organization *Facing the Future*.

www.facingthefuture.org/Curriculum/downloadFreeCurriculum/tabid/114/default.aspx

Climate Change: Take Action Now!

A guide to supporting the local actions of children and young people, with special emphasis on girls and young women.

http://www.ifrc.org/Global/Publications/youth/AYCEOs_climate-change_take-action-now_EN.pdf

Food and Agriculture Organization (FAO) of the United Nations is developing resources, activities and the mechanisms to enhance awareness, access to information and participation of children and young people in a range of environmental, social and sustainable development issues, including climate change.

<http://www.fao.org/climatechange/youth/en/>

Green learning Canada

Help your students participate in their own learning while gaining a more holistic and hopeful understanding of today's complex energy and environmental issues.

<http://www.greenlearning.ca/>

International Climate Champions (ICC) program, established by the British Council, unites global youth

on the subject of climate change. Each of the G8+5 countries selected three students (aged 16-18) in 2008 to represent the ICC at the G8 Environment Ministers' Meeting in Kobe, Japan.

<http://www.britishcouncil.org/new/climatechange/>

Kick the Habit: A UN Guide to Climate Neutrality

This online book talks about our dependence on carbon-based energy and how this “addiction” has caused a significant build-up of greenhouse gases in the atmosphere. This is a guide for everyone who wants to embark on the path to climate neutrality.

<http://www.grida.no/publications/vg/kick/ebook.aspx>

MuchMusic’s media education website examines the working conditions of “sweatshop” employees in Mexico and Bangladesh and provides an updated perspective on this controversial issue. Students watch a video entitled *Inside Your Threads* and discuss.

http://www.muchmusic.com/mediaed/guidepage_much.asp?studyid=142

Natural Resources Canada – Climate Change Posters

A series of posters depicting risks, regional climate changes, and the effects on sectoral industries. Posters and teaching guides can be ordered from 1-800 O Canada.

http://adaptation.nrcan.gc.ca/posters/index_e.php

Ontario EcoSchools has resources that relate to climate change developed for Grades 1-12. These resources are linked to different courses offered in grades 9-12.

http://ontarioecoschools.org/curriculum_resources/

Ontario Ministry of Education. The Ontario government’s progressive environmental education policy.

<http://www.edu.gov.on.ca/curriculumcouncil/shapetomorrow.pdf>

Pembina Institute

Research up-to-date information on climate change.

<http://climate.pembina.org/>

Read **United Nations Environment Programme (UNEP)’s press release** on how the atlas of Africa is changing due to climate change. See satellite images and graphs detailing landscape changes such as the evaporation of Lake Chad.

<http://www.unep.org/documents.multilingual/default.asp?documentid=538&articleid=5834&l=en>

Teaching about Climate Change: Cool schools tackle climate change

This book uses practical ideas to tackle the intangibles of climate change with experiments, waste audits and hands-on explorations. To order, visit: www.greenteacher.com/tacc.html

UNESCO Course for Secondary Teachers on Climate Change Education for Sustainable Development (CCESD). <http://unesdoc.unesco.org/images/0021/002197/219752e.pdf>

UNICEF-themed units for grades 3-5, 6-8 and 9-12 are based on UNICEF’s annual assessment of the world’s most vulnerable children: The *State of the World’s Children* report (SOWC).

<http://youth.unicefusa.org/teachunicef/units-and-lesson-plans/>

UNICEF UK’s Climate Change report 2008: *Our climate, our children, our responsibility* details the effects of climate change on our global children.

<http://www.unicef.org.uk/Documents/Publications/climate-change.pdf>

United Nations Economic Commission for Europe (UNECE) offers concrete examples of successful implementation of “Good Practices in Education for Sustainable Development” in different areas, including the school setting. This is a collection of experiences from governments, international organizations,

research institutions, NGOs and other stakeholders.

<http://www.unece.org/env/esd/goodPractices/index.html>

Sandwatch develops awareness of the fragile nature of the marine and coastal environment and the need to use it wisely. It is an educational process through which school students and community members from various countries learn and work together to critically evaluate the problems and conflicts facing their beach environments and to develop sustainable approaches to address these issues.

http://www.sandwatch.ca/climate_change.htm

The Stern Review: The Economics of Climate Change explains that climate change has resulted in very serious global risks, and it demands an immediate response from all citizens globally. Read the Executive Summary. http://www.hm-treasury.gov.uk/d/Executive_Summary.pdf

UNICEF Canada's Climate Change resources

http://globalclassroom.unicef.ca/climate_change_resource_guide

FRENCH RESOURCES:

Association Québécoise pour l'Éducation Relative à l'Environnement:

<http://www.aqpere.qc.ca/index.htm>

Centre d'écologie urbaine de Montréal:

<http://www.ecologieurbaine.net/>

Centre de recherche en éducation et formation relatives à l'environnement et l'écocitoyenneté (Université du Québec à Montréal, UQAM):

<http://www.unites.uqam.ca/ERE-UQAM/>

Environnement Jeunesse:

<http://www.deficlimat.qc.ca/>

Environnement Canada:

<http://www.ec.gc.ca/cc/default.asp?lang=Fr>

L'éducation au service de la Terre (LST):

<http://www.lsf-lst.ca/fr>

Le Réseau In Terre Actif:

<http://www.in-terre-actif.com/>

Notre-Planète.info:

http://www.notre-planete.info/actualites/actu_2089_changements_climatiques_sahara_vert.php

Wikipedia:

http://fr.wikipedia.org/wiki/Changement_climatique

APPENDIX A

GLOSSARY

Biodiversity: having many different species of plants and animals in one area.

Biomass: an organic material that can be burned or converted to create other energy types such as methane gas or fuels for transportation. Examples are wood waste, municipal solid waste, ethanol and biodiesel.

Carbon credit: a permit that gives a company, country, etc., the right to emit a specified amount of carbon compounds into the atmosphere, and may be purchased if emissions are expected to exceed a quota or sold if the quota is not reached.

Carbon footprint: a measure of the CO₂ produced as a result of human activities including work, transport and food choices.

Carbon sink: is a natural or manmade area that stores carbon. Forests and oceans are examples of natural carbon sinks as they absorb carbon.

Carbon tax: a tax on fossil fuels, especially those used by motor vehicles, intended to reduce the emission of carbon dioxide.

Cholera: a severe diarrhoeal infectious disease. It is caused by enterotoxin-producing strains of the bacterium *Vibrio Cholerae* and transmitted through food or drinking water.

Cyclone: a storm characterized by severe winds and possibly heavy rains rotating about a lower pressure point.

Dengue fever: a mosquito-borne infection that causes a severe flu-like illness.

Diarrhoea: a symptom of gastrointestinal infection, which can be caused by a variety of bacterial, viral and parasitic organisms. Severe diarrhoea leads to fluid loss, and may be life-threatening, particularly in young children and people who are malnourished or have impaired immunity.

Drought: a period of prolonged dryness that causes extensive damage to crops or prevents their successful growth.

Ecological Footprint: a measure of human impact on the Earth's resources; it is usually a metric of the number of 'earths' we need to meet our human demands.

Flashfloods: short duration heavy rains resulting in large volume localized flooding.

Forest stewardship Council (FSC): a third-party forestry certification system designed to protect our environment (both people on the land and the land itself) to ensure our forests remain a renewable resource.

Fossil Fuel: a fuel (coal, oil or natural gas) formed in the earth.

Geothermal Energy: using the heat from the Earth as an energy source. Examples are the surface at hot springs or geysers, recovered deep layers of hot water and shallow recovery of warm water (most common in building projects).

Gigatonnes: metric unit of mass, a gigatonne = 1,000,000,000 tonnes.

Global Carbon Cycle: the whole Earth's balance of carbon.

GM (Genetically Modified): organisms with genetically altered DNA; the majority of GM foods are plant-based but GM animal products are now being produced.

Greenhouse Gas Emissions (GHG): a collection of gases (largest contributor is carbon dioxide) that are being trapped in the atmosphere. This is considered a cause of climate change.

Hygiene: adopting habits of cleanliness to promote health.

IPCC: Intergovernmental Panel on Climate Change; it is a scientific-based United Nations body formed to assess the effects of climate change on humans.

Land Degradation: a human-related destruction of land so its biological value is down-graded.

Land Desertification: a human-related degradation of arid or dry sub-humid land. Often it is caused by overpopulation due to depletion of groundwater and farming.

Life Cycle Analysis (LCA): a science-based measurement system. An LCA looks at products/systems, and provides numbers for environmental impacts.

Malaria: is caused by a parasite, which is transmitted via the bites of infected mosquitoes. Symptoms of malaria include fever, headache, and vomiting. If not treated, malaria can quickly become life-threatening by disrupting the blood supply to vital organs.

Malnutrition: is due to insufficient or imbalanced consumption of food or nutrients.

Millennium Development Goals (MDG): developed by the nations who met at the Millennium Summit at UN headquarters in New York. These goals aim to improve the wellbeing of everyone on the planet by committing to end poverty, improve the health of children and their families and by ensuring the sustainability of the planet.

Ozone Layer: filters dangerous ultraviolet light to prevent it from penetrating the Earth's upper atmosphere and arriving at the surface.

Potable Water: water fit for human consumption.

Refugee: a person who flees to a foreign country to escape danger.

Sanitation: providing good hygiene and preventing spread of disease. Providing sanitary conditions include safely treating drinking water and sewage and removing garbage.

Typhoid: an infectious disease caused by the bacterium *Salmonella typhi*. Food or water carrying the bacteria is eaten; the bacteria spread fast and enter the blood stream within 24-72 hours causing blood poisoning.

Typhoon: a severe tropical storm that develops in the Pacific or Indian oceans containing high winds and rainfall. (Synonym: hurricane)

Vector-Borne Diseases: diseases spread to humans via the vector: non-human organisms such as mosquitoes and ticks that carry pathogens.

Vibrio Cholerae: a bacterium causing cholera that affects the gastrointestinal tract.

Water cycle (also called hydrologic cycle): a process whereby water passes from vapour in the atmosphere to precipitation on land and ultimately back into the atmosphere as a result of evaporation and transpiration.

Waterborne Diseases: microorganisms with pathogens found in water cause it to become contaminated; transmitted by consuming the contaminated water.

West Nile: a vector-borne disease; the vector being a mosquito.

Zoonoses: diseases transmitted by vertebrate animals (can be a vector) to humans, though normally they would only infect other animals.

APPENDIX B

THE UN CONVENTION ON THE RIGHTS OF THE CHILD IN CHILD-FRIENDLY LANGUAGE

Article 1

Everyone under 18 has these rights.

Article 2

All children have these rights, no matter who they are, where they live, what their parents do, what language they speak, what their religion is, whether they are a boy or girl, what their culture is, whether they have a disability, whether they are rich or poor. No child should be treated unfairly on any basis.

Article 3

All adults should do what is best for you. When adults make decisions, they should think about how their decisions will affect children.

Article 4

The government has a responsibility to make sure your rights are protected. They must help your family to protect your rights and create an environment where you can grow and reach your potential.

Article 5

Your family has the responsibility to help you learn to exercise your rights, and to ensure that your rights are protected.

Article 6

You have the right to be alive.

Article 7

You have the right to a name, and this should be officially recognized by the government. You have the right to a nationality (to belong to a country).

Article 8

You have the right to an identity 0 an official record of who you are. No one should take this away from you.

Article 9

You have the right to live with your parent(s), unless it is bad for you. You have the right to live with a family who cares for you.

Article 10

If you live in a different country than your parents do, you have the right to be together in the same place.

Article 11

You have the right to be protected from kidnapping.

Article 12

You have the right to give your opinion, and for adults to listen and take it seriously.

Article 13

You have the right to find out things and share what you think with others, by talking, drawing, writing or in any other way unless it harms or offends other people.

Article 14

You have the right to choose your own religion and beliefs. Your parents should help you decide what is right and wrong, and what is best for you.

Article 15

You have the right to choose your own friends and join or set up groups, as long as it isn't harmful to others.

Article 16

You have the right to privacy.

Article 17

You have the right to get information that is important to your wellbeing, from radio, newspapers, books, computers and other sources. Adults should make sure that the information you are getting is not harmful, and help you find and understand the information you need.

Article 18

You have the right to be raised by your parent(s) if possible.

Article 19

You have the right to be protected from being hurt and mistreated, in body or mind.

Article 20

You have the right to special care and help if you cannot live with your parents.

Article 21

You have the right to care and protection if you are adopted or in foster care.

Article 22

You have the right to special protection and help if you are a refugee (if you have been forced to leave your home and live in another country), as well as all the rights in this Convention.

Article 23

You have the right to special education and care if you have a disability, as well as all the rights in this Convention, so that you can live a full life.

Article 24

You have the right to the best health care possible, safe water to drink, nutritious food, a clean and safe environment, and information to help you stay well

Article 25

If you live in care or in other situations away from home, you have the right to have these living arrangements looked at regularly to see if they are the most appropriate.

Article 26

You have the right to help from the government if you are poor or in need.

Article 27

You have the right to food, clothing, a safe place to live and to have your basic needs met. You should not be disadvantaged so that you can't do many of the things other kids can do.

Article 28

You have the right to a good quality education. You should be encouraged to go to school to the highest level you can.

Article 29

Your education should help you use and develop your talents and abilities. It should also help you learn to live peacefully, protect the environment and respect other people.

Article 30

You have the right to practice your own culture, language and religion or any you choose. Minority and indigenous groups need special protection of this right.

Article 31

You have the right to play and rest.

Article 32

You have the right to protection from work that harms you, and is bad for your health and education. If you work, you have the right to be safe and paid fairly.

Article 33

You have the right to protection from harmful drugs and from the drug trade.

Article 34

You have the right to be free from sexual abuse.

Article 35

No one is allowed to kidnap or sell you.

Article 36

You have the right to protection from any kind of

exploitation (being taken advantage of).

Article 37

No one is allowed to punish you in a cruel or harmful way.

Article 38

You have the right to protection and freedom from war. Children under 15 cannot be forced to go into the army or take part in war.

Article 39

You have the right to help if you've been hurt, neglected or badly treated.

Article 40

You have the right to legal help and fair treatment in the justice system that respects your rights.

Article 41

If the laws of your country provide better protection of your rights than the articles in this Convention, those laws should apply.

Article 42

You have the right to know your rights! Adults should know about these rights and help you learn about them, too.

Articles 43 to 54

These articles explain how governments and international organizations like UNICEF will work to ensure that the rights of children are protected.

Source: UN Convention on the Rights of the Child, Child-Friendly version, UNICEF website. Available from:
www.unicef.ca/portal/smartdefault.aspx?at=1451.

To access the complete version of the UNCRC and/or to learn more about the UN Convention on the Rights of the Child, visit
<http://www.unicef.org/crc/>.

APPENDIX C

CULMINATING TASK RUBRIC

Name:

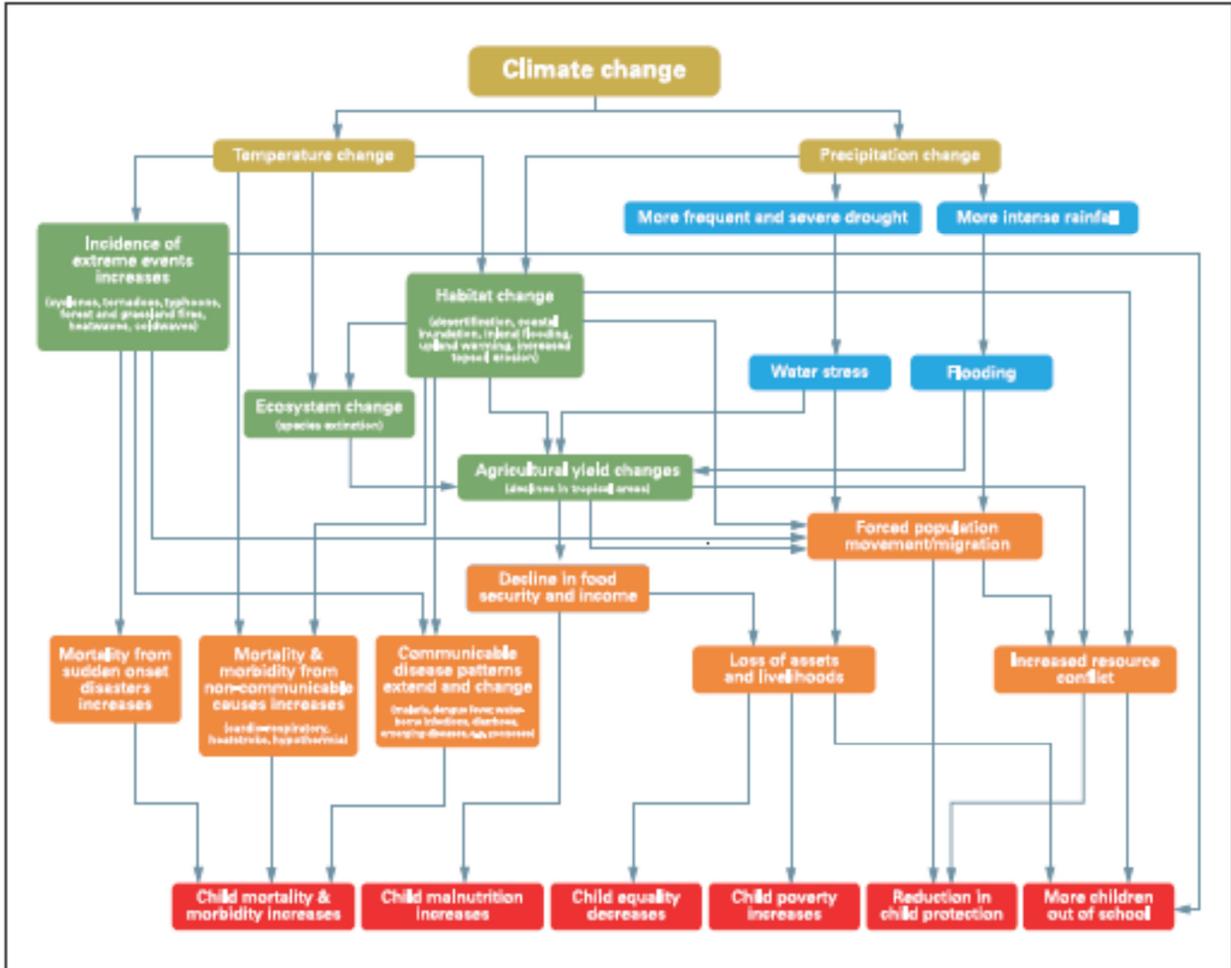
Date:

Expectations	Level 4	Level 3	Level 2	Level 1
KNOWLEDGE/ UNDERSTANDING Demonstrates a thorough understanding of the issues raised connecting climate change to children and provides an explanation of why it is a concern	Demonstrates a high degree of understanding of the issues raised connecting climate change to children and provides a thorough explanation of why it is a concern	Demonstrates considerable understanding of the issues raised connecting climate change to children and provides considerable explanation of why it is a concern	Demonstrates some understanding of the issues raised connecting climate change to children and provides some explanation of why it is a concern	Demonstrates limited understanding of the issues raised connecting climate change to children and provides a limited explanation of why it is a concern
THINKING/ INQUIRY Uses planning skills to generate ideas and gather information on issues raised connecting climate change to children	Uses planning skills with a high degree of effectiveness	Uses planning skills with considerable effectiveness	Uses planning skills with some effectiveness	Uses planning skills with limited effectiveness
COMMUNICATION Expresses ideas, perspective and recommendations on issues raised connecting climate change to children in oral, visual and written formats Uses clear language and presents point of view effectively, using an appropriate style and tone for the specific audience	Expresses ideas, perspective and recommendations with a high degree of effectiveness Uses clear language, point of view, style and tone with a high degree of effectiveness	Expresses ideas, perspective and recommendations with considerable effectiveness Uses clear language, point of view, style and tone with considerable effectiveness	Expresses ideas, perspective and recommendations with some effectiveness Uses clear language, point of view, style and tone with some effectiveness	Expresses ideas, perspective and recommendations with limited effectiveness Uses clear language, point of view, style and tone with limited effectiveness
APPLICATION Makes connections between personal and local concerns and global issues related to climate change and children	Makes connections between personal and local concerns and global issues with a high degree of effectiveness	Makes connections between personal and local concerns and global issues with considerable effectiveness	Makes connections between personal and local concerns and global issues with some effectiveness	Makes connections between personal and local concerns and global issues with limited effectiveness

Adapted from: Ministry of Education, The Ontario Curriculum

APPENDIX D

HOW CLIMATE CHANGE AFFECTS CHILDREN



APPENDIX E

REFLECT AND ACT

Take 10 minutes and reflect on lessons learned.

REFLECT	
Theme: _____	
What did you LEARN?	
What issue GOT to you?	
What are you going to do NOW?	

ACT	
What actions can you take to be part of the solution?	
YOU	
YOUR SCHOOL	
YOUR COMMUNITY	
YOUR PLANET	

APPENDIX F

MILLENNIUM DEVELOPMENT GOALS

In 2000 the largest gathering of world leaders in history met for the Millennium Summit at United Nations headquarters in New York. The nations met to discuss how increased globalization promises better living for some countries, but means increased poverty, conflict, health concerns and a degraded environment for others. Collectively, the nations present at the summit drafted the millennium development goals (MDG), which act as a blueprint for future actions.

Climate change has added a challenge to meeting the plan set out by the Millennium Development Goals (MDG). These goals aim to improve the wellbeing of everyone on the planet by committing to end poverty, improve the health of children and their families and by ensuring the sustainability of the planet. Here is how the MDGs are linked directly to climate change:

Millennium Development Goals	Examples of Links to the Environment
1. Eradicate extreme poverty and hunger	Livelihood strategies and food security of the poor often depend directly on healthy ecosystems and the diversity of goods and ecological services they provide.
2. Achieve universal primary education	<p>Time spent collecting water and fuel wood by children, especially girls, can reduce time at school.</p> <p>Better lighting allows children to study outside of daylight hours and without putting their eyesight at risk.</p>
3. Promote gender equality to empower women	Poor women are especially exposed to indoor air pollution and the burden of collecting fuel wood, and have unequal access to land, energy and other natural resources.
4. Reduce child mortality	Each year, more than 4 million children under the age of five die due to preventable environment-related disease. More than one-third of the global disease burden can be attributed to environmental factors falling on children below five years of age, who account for only about 10% of the world's population.
5. Improve maternal health	Indoor air pollution and carrying heavy loads of water and fuel wood adversely affect women's health and can make women less fit for childbirth and at greater risk of complications during pregnancy.
6. Combat HIV/AIDS, malaria and other major diseases	<p>Over 24% of the total burden of diseases worldwide are associated with environmental risk factors and preventive environmental health measures are as important and at times more cost-effective than health treatments.</p> <p>Evidence now indicates that diminished immune systems caused by water-related intestinal worm infections, contribute to the HIV/AIDS pandemic.</p>
7. Ensure environmental sustainability	<p>Current trends in environmental degradation must be reversed in order to sustain the health and productivity of the world's ecosystem.</p> <p>The reliance on fuel wood can put considerable pressure on forests, particularly in areas where biomass is scarce and the demand for wood outweighs natural re-growth. Depending on the environmental context, deforestation is a driving force for land degradation and desertification.</p>

Source: DFID/EC/UNDP/World Bank (2002), Linking Poverty Reduction and Environmental Management: Policy Challenges and Opportunities. Washington: The World Bank, p.1 . Updated, WHO data, 2006 by UNICEF

To learn about the MDGs and to follow the progress to reach the goals, visit:

- <http://www.un.org/millenniumgoals/bkqd.shtml>
- <http://www.unicef.org/mdg/>.

What happens next?

Goals set out by the global community will always need to be updated. At the time of the publication of this resource, the MDGs are being evaluated and the next steps being explored.

Beyond 2015 is a global campaign aiming to influence the creation of a post 2015 development framework that succeeds the current UN Millennium Development Goals. **Beyond 2015** is bringing together more than 570 civil society organizations in over 95 countries around the world. You can read more about it here: <http://www.beyond2015.org/>

APPENDIX G

CURRICULUM LINKS FOR BRITISH COLUMBIA

Course	Selected PLO	Related Themes
Science 9	<i>Physical Science: Characteristics of Electricity</i> • relate electrical energy to power consumption C R E	Energy
	<i>Processes of Science</i> • demonstrate ethical, responsible, cooperative behaviour	Energy
Science 10	<i>Energy Transfer in Natural Systems</i> • evaluate possible causes of climate change and its impact on natural systems	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
	<i>Sustainability of Ecosystems</i> • explain various ways in which natural populations are altered or kept in equilibrium	Natural Disasters, Health,
	<i>Processes of Science</i> • demonstrate ethical, responsible, cooperative behaviour	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
Earth Science 11	<i>Surface Processes and the Hydrosphere</i> • describe the function of the hydrologic cycle	Water
	<i>Earth Materials (Rocks and Minerals)</i> • assess the extraction and use of geological resources	Energy
Biology 11	<i>Ecology</i> • analyze the functional inter-relationships of organisms within an ecosystem	Natural Environments
Sustainable Resources 11	• analyze the environmental, social, and economic significance of forestry and related industries at the local, provincial, and global levels • describe the processes associated with the generation and use of energy resources	Natural Environments, Energy Energy

CURRICULUM LINKS FOR BRITISH COLUMBIA

Course	Selected PLO	Related Themes
Science and Technology 11	<p><i>Agriculture</i></p> <ul style="list-style-type: none"> • describe elements of agricultural systems found locally, provincially, and globally • describe the role of genetics in agriculture • evaluate different methods, including those from Aboriginal cultures, of food production, processing, and preservation • analyze the effects of changing technology in agriculture on society 	Food Security
	<p>Natural Resources and the Environment</p> <ul style="list-style-type: none"> • discuss the impact of society on natural resource management and the 	Water, Energy
Sustainable Resources 12	<p>Components of Sustainable Agricultural Systems</p> <ul style="list-style-type: none"> • investigate the role of climate in agricultural production 	Natural Disasters
	<p>Agriculture 12</p> <p><i>Components of Sustainable Agricultural Systems</i></p> <ul style="list-style-type: none"> • debate the concept of sustainability as it relates to agriculture • analyze the use of water, fertilizers, pesticides, and pharmaceuticals in agricultural activities • investigate the role of climate in agricultural production 	Food Security
	<p><i>Forest Resources and Society</i></p> <ul style="list-style-type: none"> • analyze current forest management practices 	Natural Environments
	<p><i>Forest Ecology</i></p> <ul style="list-style-type: none"> • examine the components of forest ecosystems • investigate the interactions found within a forest environment • assess the impact of environmental components and changes on a forest ecosystem 	
Socials 1	<p><i>Human Geography</i></p> <ul style="list-style-type: none"> • assess environmental challenges facing Canadians, including <ul style="list-style-type: none"> – global warming – ozone layer depletion – fresh water quality and supply 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
Civics 1	<p><i>Informed citizenship</i></p> <ul style="list-style-type: none"> • describe organizations that govern relations among nations, including those dealing with: <ul style="list-style-type: none"> – peace and security – trade and economics – international justice – social and environmental issues 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy

CURRICULUM LINKS FOR BRITISH COLUMBIA

Course	Selected PLO	Related Themes
	<p><i>Civic Deliberation</i></p> <ul style="list-style-type: none"> analyze the domestic and international effects of Canada's record with respect to issues and events in one or more of the following categories: <ul style="list-style-type: none"> environment trade foreign aid peace and security human rights 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
Geography 12	<p><i>Weather and Climate</i></p> <ul style="list-style-type: none"> analyze interactions between human activity and the atmosphere, with reference to: <ul style="list-style-type: none"> global climate change ozone depletion acid precipitation 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
	<p><i>Resources and Environmental Sustainability</i></p> <ul style="list-style-type: none"> assess the environmental impact of human activities, including: <ul style="list-style-type: none"> energy production and use forestry agriculture waste disposal water use 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
Geography 12	<p><i>Biomes</i></p> <ul style="list-style-type: none"> analyze the interactions between human activity and biomes, with reference to: <ul style="list-style-type: none"> deforestation desertification soil degradation species depletion 	Natural Environments
Social Justice 12	<p><i>Defining Social Justice</i></p> <ul style="list-style-type: none"> apply critical thinking skills to a range of social justice issues, situations, and topics analyze selected social justice issues from an ethical perspective assess how belief systems can affect perspectives and decisions in relation to social justice issues conduct a self-assessment of their own attitudes and behaviours related to social justice 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
	<p><i>Recognizing and Analyzing Injustice</i></p> <ul style="list-style-type: none"> analyze social justice issues related to globalism and globalization 	Natural Disasters, Food Security, Health, Natural Environments, Water
	<p><i>Moving Toward a Socially Just World</i></p> <ul style="list-style-type: none"> assess various methods and models of promoting social justice apply systemic analysis to propose solutions to specific cases of social injustice implement a plan for action on a selected local, provincial, national, or international social justice issue assess lifelong opportunities related to social justice 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy

CURRICULUM LINKS FOR BRITISH COLUMBIA

Course	Selected PLO	Related Themes
Visual Arts 9	<ul style="list-style-type: none"> • create images that: <ul style="list-style-type: none"> – support or challenge personal and societal beliefs, values, traditions, or practices – demonstrate an awareness of the styles of various artists, movements, and periods – respond to historical and contemporary images or issues – reflect a sense of personal and social responsibility 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
Visual Arts 10	<ul style="list-style-type: none"> • create images that: <ul style="list-style-type: none"> – support or challenge personal and societal beliefs, values, traditions, or practices – reflect an understanding of responsibility to the context of a specific audience 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
Visual Arts 11	<ul style="list-style-type: none"> • create/perform a work of art that reflects an understanding of the impact of social/cultural/ historical contexts 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
Visual Arts 12	<ul style="list-style-type: none"> • use a variety of media arts technologies to create images that: <ul style="list-style-type: none"> – support or challenge beliefs, values, and traditions – incorporate characteristics of other artists, movements, and periods in personal style – reflect historical and contemporary issues • create/perform a work of art that communicates specific beliefs/traditions in response to historical/contemporary issues 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy Natural Disasters, Health, Natural Environments, Water, Energy
Drama 1: Theatre	Encourage students in drama to use sustainability topics in their drama performance. During set design, challenge students to use environmentally friendly materials.	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
Dance 12	<ul style="list-style-type: none"> • Create compositions for a variety of purposes: <ul style="list-style-type: none"> – to respond to or represent a range of stimuli for a variety of settings – to represent different points of view 	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
English Language Arts 9-12	Educators can include environmental topics in many English Language PLOs to allow students to understand the connection between them and the environment.	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy

APPENDIX H

CURRICULUM LINKS FOR ONTARIO

Course	Overall Expectations	Related Themes
SNCID Science, Grade 9 Academic	<p><i>Biology</i></p> <p>B1. assess the impact of human activities on the sustainability of terrestrial and/or aquatic ecosystems, and evaluate the effectiveness of courses of action intended to remedy or mitigate negative impacts;</p> <p>B2. investigate factors related to human activity that affect terrestrial and aquatic ecosystems, and explain how they affect the sustainability of these ecosystems;</p> <p>B3. demonstrate an understanding of the dynamic nature of ecosystems, particularly in terms of ecological balance and the impact of human activity on the sustainability of terrestrial and aquatic ecosystems.</p>	Natural Disasters, Food Security, Natural Environments, Water
	<p><i>Physics</i></p> <p>E1. assess some of the costs and benefits associated with the production of electrical energy from renewable and non-renewable sources, and analyze how electrical efficiencies and savings can be achieved, through both the design of technological devices and practices in the home.</p>	
SNC1P Science, Grade 9 Applied	<p><i>Biology</i></p> <p>B1. analyze the impact of human activity on terrestrial or aquatic ecosystems, and assess the effectiveness of selected initiatives related to environmental sustainability;</p> <p>B2. investigate some factors related to human activity that affect terrestrial or aquatic ecosystems, and describe the consequences that these factors have for the sustainability of these ecosystems;</p> <p>B3. demonstrate an understanding of characteristics of terrestrial and aquatic ecosystems, the interdependence within and between ecosystems, and the impact humans have on the sustainability of these ecosystems.</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
	<p><i>Physics</i></p> <p>E1. assess the major social, economic, and environmental costs and benefits of using electrical energy, distinguishing between renewable and non-renewable sources, and propose a plan of action to reduce energy costs.</p>	
SNC2D Science, Grade 10	<p><i>Earth and Space Science</i></p> <p>D1. analyze some of the effects of climate change around the world, and assess the effectiveness of initiatives that attempt to address the issue of climate change;</p> <p>D2. investigate various natural and human factors that influence Earth's climate and climate change;</p> <p>D3. demonstrate an understanding of natural and human factors, including the greenhouse effect, that influence Earth's climate and contribute to climate change.</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy

CURRICULUM LINKS FOR ONTARIO

Course	Overall Expectations	Related Themes
SNC2P Science, Grade 10 Applied	<p><i>Earth and Space Science</i></p> <p>D1. analyze effects of human activity on climate change, and effects of climate change on living things and natural systems;</p> <p>D2. investigate various natural and human factors that have an impact on climate change and global warming;</p> <p>D3. demonstrate an understanding of various natural and human factors that contribute to climate change and global warming.</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
SBI3U Biology, Grade 11	<p><i>Diversity of Living Things</i></p> <p>B1. analyze the effects of various human activities on the diversity of living things.</p>	Natural Environments
	<p><i>Plants in the Natural Environment</i></p> <p>F1. analyze the roles of plants in ecosystems, and assess the impact of human activities on the balance of plants within those ecosystems.</p>	Food security, Natural Environments
SCH3U Chemistry, Grade 11	<p>Solutions and Solubility</p> <p>E1. analyze the origins and effects of water pollution, and a variety of economic, social, and environmental issues related to drinking water.</p>	Water
	<p><i>Gases and Atmospheric Chemistry</i></p> <p>F1. analyze the cumulative effects of human activities and technologies Environments, on air quality, and describe some Canadian initiatives to reduce air pollution, including ways to reduce their own carbon footprint.</p>	Natural Environments, Energy
SVN3E Environmental Science, Grade 11 Workplace Prep	<p><i>Human Impact on the Environment</i></p> <p>B1. analyze selected current environmental problems in terms of the role human activities have played in creating or perpetuating them, and propose possible solutions to one such problem;</p> <p>B2. investigate air, soil, and water quality in natural and disturbed environments, using appropriate technology;</p> <p>B3. demonstrate an understanding of some of the ways in which human activities affect the environment and how the impact of those activities is measured and monitored.</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
	<p><i>Human Health and the Environment</i></p> <p>C1. analyze the effects on human health of environmental contaminants and a significant environmental phenomenon;</p> <p>C2. investigate how different environmental factors can affect people's health and their lifestyle choices;</p> <p>C3. demonstrate an understanding of the ways in which environmental factors can affect human health and how their impact can be reduced.</p>	Food Security, Health, Water, Energy

CURRICULUM LINKS FOR ONTARIO

Course	Overall Expectations	Related Themes
	<p><i>Energy Conservation</i></p> <p>D1. evaluate initiatives and technological innovations related to energy consumption and conservation, and assess their impact on personal lifestyles, social attitudes, and the environment;</p> <p>D2. investigate various methods of conserving energy and improving energy efficiency;</p> <p>D3. demonstrate an understanding of the basic principles of energy production, with reference to both renewable and non-renewable sources, and of various methods of energy conservation.</p>	Energy
	<p><i>Natural Resource Science and Management</i></p> <p>E1. assess the environmental impact of the harvesting and/or extraction of resources, including ways of reducing this impact, and analyze threats to the sustainability of natural resources;</p> <p>E2. investigate methods scientists use to classify and monitor natural resources, and conduct investigations using those methods;</p> <p>E3. demonstrate an understanding of the sustainable use of resources and its relationship to the biodiversity and sustainability of ecosystems.</p>	Natural Environments
SVN3M Environmental Science, Grade 1 , University/College Preparation	<p>B1. analyze social and economic issues related to an environmental challenge, and how societal needs influence scientific endeavours related to the environment;</p> <p>B2. investigate a range of perspectives that have contributed to scientific knowledge about the environment, and how scientific knowledge and procedures are applied to address contemporary environmental problems;</p> <p>B3. demonstrate an understanding of major contemporary environmental challenges and how we acquire knowledge about them.</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
	<p><i>Human Health and the Environment</i></p> <p>C1. analyze initiatives, both governmental and non-governmental, that are intended to reduce the impact of environmental factors on human health;</p> <p>C2. investigate environmental factors that can affect human health, and analyze related data;</p> <p>C3. demonstrate an understanding of various environmental factors that can affect human health, and explain how the impact of these factors can be reduced.</p>	Food Security, Health, Water
	<p><i>Sustainable Agriculture and Forestry</i></p> <p>D1. evaluate the impact of agricultural and forestry practices on human health, the economy, and the environment;</p> <p>D2. investigate conditions necessary for plant growth, including the soil components most suitable for various species, and various environmentally sustainable methods that can be used to promote growth;</p> <p>D3. demonstrate an understanding of conditions required for plant growth and of a variety of environmentally sustainable practices that can be used to promote growth.</p>	Food Security, Natural Environments, Water

CURRICULUM LINKS FOR ONTARIO

Course	Overall Expectations	Related Themes
	<p><i>Conservation of Energy</i></p> <p>F1. assess the impact on society and the environment of the use of various renewable and non-renewable energy sources, and propose a plan to reduce energy consumption;</p> <p>F2. investigate various methods of conserving energy and improving energy efficiency;</p> <p>F3. demonstrate an understanding of energy production, consumption, and conservation with respect to a variety of renewable and non-renewable sources.</p>	Energy
SPH4C Physics, Grade 12	<p><i>Electricity and Magnetism</i></p> <p>D1. analyze the development of selected electrical and electromagnetic technologies, and evaluate their impact on society and the environment.</p>	Energy
SNC4M Science, Grade 12	<p><i>Biotechnology</i></p> <p>F2. investigate various techniques used in biotechnology and how they are applied in the food industry and the health and agricultural sectors;</p> <p>F3. demonstrate an understanding of biological processes related to biotechnology and of applications of biotechnology in the health, agricultural, and environmental sectors.</p>	Food Security, Health
HFN10 and HFN20 Social Sciences and the Humanities: Food and Nutrition, Grades 9 and 10	<p><i>Diversity, Interdependence, and Global Connections</i></p> <p>Complete an investigation of current global issues related to food (e.g., food distribution, food shortages, gene manipulation), using current social science research methods.</p>	Food Security
	<p><i>Social Science Skills</i></p> <p>Demonstrate effective collaborative group skills.</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
HIF10 and HIF20 Social Sciences and the Humanities: Individual and Family Living, Grades 9 and 10	<p><i>Social Science Skills</i></p> <p>Demonstrate effective collaborative group skills.</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
HPW3C Social Sciences and the Humanities: Living and Working with Children, Grade 11	<p><i>Growth and Development</i></p> <p>Demonstrate an understanding of the multifaceted nature of and the various influences on child development.</p>	Food Security, Health, Water
	<p><i>Socialization of Children</i></p> <p>Evaluate various global influences on children and families.</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy

CURRICULUM LINKS FOR ONTARIO

Course	Overall Expectations	Related Themes
HIR3C Social Sciences and the Humanities: Managing Personal and Family Resources, Grade 11	<i>Preparing for the Challenges of the Future</i> Analyze how families are affected by global disparities in wealth and resources.	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
HF4AM Social Sciences and the Humanities: Food and Nutrition Sciences, Grade 12	<i>Personal and Social Responsibilities</i> Determine the relationship among nutrition, lifestyle, health, and disease.	Natural Disasters Food Security, Health, Water
	<i>Diversity, Interdependence and Global Connections</i> <ul style="list-style-type: none"> • identify the economic, political, and environmental factors that affect food production and supply throughout the world; • identify the factors that are critical to achieving and maintaining food security and eliminating hunger. 	Natural Disasters, Food Security, Health, Water
ADA10 Dramatic Arts, Grade 9	<i>Concepts and Terminology</i> C1.1 identify the drama forms, elements, conventions, and techniques used in their own and others' drama works, and explain how the various components are used or can be used to achieve specific purposes or effects.	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
ADA20 Grade 10 Drama	<i>The Creative Process</i> A1.1 develop interpretations of issues from contemporary or historical sources A1.2 select and use appropriate forms to present identified issues from a variety of perspectives A1.3 use role play and characterization to explore personal and social issues <i>Elements and Conventions</i> A2.2 use a variety of conventions to create a distinct voice that reflects a particular global, social, or personal perspective	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
ASM20 Grade 10 Media Arts	<i>The Critical Analysis Process</i> B1.3 use the critical analysis process to assess the effectiveness of media art works in communicating a message or expressing an emotion, and describe how their assessment of the works has evolved throughout the critical analysis process <i>Identity and Values</i> B2.3 identify and describe ways in which media art works can influence community or societal values <i>Responsible Practices</i> C3.3 identify and apply responsible environmental practices associated with the media arts workplace	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy

CURRICULUM LINKS FOR ONTARIO

Course	Overall Expectations	Related Themes
ADA3M Dramatic Arts, Grade 11	<p><i>The Critical Analysis Process</i> B1.2 analyse drama works to determine how they communicate ideas about issues, culture, and society</p> <p><i>Drama and Society</i> B2.4 explain how different types of theatre mirror cultural diversity and local or regional concerns in Canadian and global societies from the past and present</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
BB110/BB120 Grades 10 & 11 Introduction to Business	<p><i>Functions of a Business</i> Demonstrate an understanding of a sound management practices in business</p> <p>Explain the importance of ethical behaviour with respect to employees, the environment, and communities</p> <p><i>Entrepreneurship</i> Analyze the importance of invention and innovation in entrepreneurship</p> <p>Describe how entrepreneurs discover opportunities in people's needs, wants, and problems</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
BDP30 Grade 11 The Enterprising Person	<p><i>The Enterprising Experience: Planning and Organizing an Event</i> Generate and evaluate ideas for an event in the school or the community and identify a realistic event to plan and organize</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
BDV4C Grade 12 Entrepreneurship: Venturing Planning in an Electronic Age	<p><i>The Venture Concept</i> Identify community problems, needs, or wants, and explain how selected problems, needs, or wants could be addressed</p> <p>Identify community problems, needs, or wants that could best be addressed by a not-for-profit venture and explain why</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
CGC1D Geography of Canada, Academic	<p><i>Global Connections</i> Evaluate Canada's participation in organizations that deal with global issues (eg global warming, biodiversity, human rights)</p> <p><i>Understanding and Managing Change</i> Explain how natural and human systems change over time and from place to place</p> <p>Explain how global economic and environmental factors affect individual choices</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy

CURRICULUM LINKS FOR ONTARIO

Course	Overall Expectations	Related Themes
CGC1P Geography of Canada, Applied	<p><i>Global Connections</i> Report on how Canada influences and is influenced by its economic, cultural, and environmental connections with other countries</p> <p>Evaluate Canada’s effectiveness and commitment in responding to global challenges and promoting international well being</p> <p>Explain how current global issues affect Canadians</p> <p>Compare the “ecological footprint” of a typical Canadian with those from people from other countries</p> <p><i>Understanding and Managing Change</i> Explain the relationship between sustainability, stewardship, and an “Ecological footprint”</p> <p>Describe how regional disparities (eg in resource accessibility) affect the economic sustainability of communities</p> <p>Apply the concepts of stewardship and sustainability to analyse a current national or international issue</p> <p>Predict the impact of selected technological changes (eg in communications and information technology, renewable energy technology) on the future quality of life for Canadians</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
CGF3M Grade 11 Physical Geography: Patterns, Processes, and Interactions	<p><i>Global Connections</i> Explain the importance of water to global systems</p> <p><i>Understanding and Managing Change</i> Analyse the causes and consequences of climate change</p> <p>Analyse how changes in natural systems are caused by natural phenomena</p> <p>Explain how human uses of the earth, especially uses involving technology, cause changes over time in natural systems</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
CGW4U Grade 12 Canadian and World Issues: A Geographic Analysis	<p><i>Geographic Foundations: Space and Systems</i> Compare the cultural, economic, and political aspirations of selected groups and the effects of their actions on local, national, and global geographic issues</p> <p><i>Human-Environmental Interactions</i> Evaluate approaches, policies, and principles relating to the protection and sustainability of the planet’s life support systems</p> <p><i>Global Connections</i> Evaluate the social, economic, and environmental impact of the strategies for sustainable development implemented by a variety of individuals, organizations, and institutions</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy

CURRICULUM LINKS FOR ONTARIO

Course	Overall Expectations	Related Themes
	<p><i>Understanding and Managing Change</i> Analyze trends and predict changes in the human use of the earth of its resources</p> <p>Evaluate the cultural, economic, and environmental impact of changing technology</p> <p>Evaluate the effectiveness of short-term and long-term solutions to geographic problems and issues at the local, national, and global level</p>	
CGR4M The Environment and Resource Management, Grade 12	<p><i>Geographic Foundations: Space and Systems</i> Explain how key ecological processes contribute to ecosystem health</p> <p>Analyse how the distribution of ecosystems has been and continues to be influenced by natural conditions</p> <p><i>Human-Environmental Interactions</i> Explain significant short-term and long term effects of human activity on the natural environment</p> <p>Analyse and evaluate interrelationship among the environment, the economy, and society</p> <p>Analyse patterns of social resource availability and use</p> <p><i>Global Connections</i> Analyse environmental and resource management issues and explain their global implications</p> <p>Explain how population growth affects the sustainability of global ecosystems</p> <p>Evaluate the effectiveness of the efforts of the international community to deal with environmental and resource management issues</p> <p><i>Understanding and Managing Change</i> Evaluate the impact of economic, social, political, and technological change on natural and human systems</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
CGU4C Grade 12 World Geography: Urban Patterns and Interactions	<p><i>Human-Environmental Interactions</i> Describe how the natural environment influences the location and development of settlements</p> <p>Explain how humans modify the environment to meet urban needs</p> <p>Assess the effects of human activities on urban and regional ecosystems and propose solutions to urban environmental problems</p> <p><i>Global Connections</i> Describe the influence of social, cultural, political, environmental, and economic factors on the development of urban settlements in different parts of the world</p> <p>Analyse the relationships between cities and their surrounding regions</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy

CURRICULUM LINKS FOR ONTARIO

Course	Overall Expectations	Related Themes
CGR4E Grade 12, Workplace Preparation	<p><i>Human-Environmental Interactions</i> Explain how humans both depend upon and are an integral part of ecosystems</p> <p>Analyse how human activities have positive and negative effects on natural systems</p> <p>Analyse patterns of resource availability and use</p> <p><i>Global Connections</i> Explain the relationships among population growth, increasing consumption of resources, and environmental degradation on a global scale.</p> <p>Explain how the sustainable use of resources may be achieved through the cooperation of governments, businesses, industries, non-governmental organizations, and citizens around the world, even though their environmental perspectives may differ.</p> <p><i>Understanding and Managing Change</i> Describe trends in the consumption of natural resources and in resource management practices</p> <p>Describe the process of environmental degradation in an ecosystem and assess an existing rehabilitation strategy or devise a new one</p> <p>Evaluate the effects that environmental protection and resource management have on society</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy
TPJ2O Health Care, Grade 10	<p><i>Health Care and the Environment</i> C1 Demonstrate an understanding of environmental issues related to health care and personal well-being</p> <p>Identify current environmental issues and describe their implications for human health and well-being</p> <p><i>Health Care and Society</i> Identify current child and adolescent health issues in developing countries from recent media coverage</p>	Food Security, Health, Water,
TGJ3O Communications Technology: Broadcast and Print Production	<p>Students develop an understanding of the interrelationship between the technology or industry sector and the environment, and between the technology and various aspects of society.</p> <p>Specific Expectations:</p> <p>C1.1 describe the effects of current audio, video, broadcast journalism, graphic arts, and printing technologies on the environment</p> <p>C1.2 describe ways in which environmental problems are being or can be addressed by the audio, video, broadcast journalism, graphic arts, and printing industries</p>	Natural Disasters, Food Security, Health, Natural Environments, Water, Energy

Note: this is not an exhaustive list of curriculum expectations. Please refer to the Ontario Ministry of Education's resource guide (2011) *Environmental Education: Scope and Sequence of Expectations* for a full list of courses and expectations on environmental education and climate change:
<http://www.edu.gov.on.ca/eng/curriculum/secondary/enviro9to12curr.pdf>

APPENDIX I

CURRICULUM LINKS FOR ALBERTA, SASKATCHEWAN, MANITOBA,
QUEBEC AND ATLANTIC CANADA

ALBERTA

Grade/Subject	Expectations	Related Themes
Grade 9 Science Unit A: Biological Diversity	<p>Investigate and interpret diversity among species and within species, and describe how diversity contributes to species survival.</p> <ul style="list-style-type: none"> identify the role of variation in species survival under changing environment conditions. <p>Identify impacts of human action on species survival and variation within species, and analyze related issues for personal and public decision making.</p> <ul style="list-style-type: none"> describe ongoing changes in biological diversity through extinction and extirpation of native species, and investigate the role of environmental factors in causing these changes. investigate and describe the use of biotechnology in environmental, agricultural or forest management; and identify impacts and issues. 	Natural Disasters, Natural Environment
Grade 9 Science Unit C: Environmental Chemistry	<p>Investigate and describe, in general terms, the role of different substances in the environment in supporting or harming humans or other living things.</p> <ul style="list-style-type: none"> Describe and illustrate processes by which chemicals are introduced to the environment or their concentrations are changed. Identify questions that may need to be addressed in deciding what substances – in what amounts – can be released safely into the environment. <p>Identify processes for measuring the quantity of different substances in the environment and for monitoring air and water quality.</p> <ul style="list-style-type: none"> Identify chemical factors in an environment that might affect the health and distribution of living things in that environment. <p>Analyze and evaluate mechanism affecting the distribution of potentially harmful substances within the environment.</p> <ul style="list-style-type: none"> Investigate and evaluate potential risks resulting from consumer practices and industrial processes, and identify processes used in providing information and setting standards to manage these risks. Identify and evaluate information and evidence related to an issue in which environmental chemistry plays a major role. 	Health, Natural Environment, Water

CURRICULUM LINKS FOR ALBERTA

Grade/Subject	Expectations	Related Themes
Grade 9 Science Unit D: Electrical Principles and Technology	<p>Describe and discuss the societal and environmental implications of the use of electrical energy.</p> <ul style="list-style-type: none"> • Identify and evaluate alternative sources of electrical energy, including oil, gas, coal, biomass, wind, waves. • Describe the by-products of electrical generation and their impacts on the environment. • Identify concerns regarding conservation of energy resources, and evaluate means for improving the sustainability of energy use. <p>Attitude Outcome</p> <p>Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment.</p>	Energy, Natural Environment
Science 10 Unit D: Energy Flow in Global System	<p>Describe how the relationship among input solar energy, output terrestrial energy and energy flow within the biosphere affect the lives of humans and other species.</p> <ul style="list-style-type: none"> • Explain how climate affects the lives of people and other species, and explain the need to investigate climate change. <p>Relate climate to the characteristics of the world's major biomes, and compare biomes in different regions of the world.</p> <ul style="list-style-type: none"> • Identify the potential effects of climate change on environmentally sensitive biomes. <p>Investigate and interpret the role of environmental factors on global energy transfer and climate change.</p> <p>Attitude Outcome</p> <p>Demonstrate sensibility and responsibility.</p> <p>In pursuing a balance between the needs of humans and a sustainable environment.</p>	Natural Disasters, Health, Natural Environment, Energy

CURRICULUM LINKS FOR ALBERTA

Grade/Subject	Expectations	Related Themes
Science 20	<p>General Attitude Outcomes Science 20</p> <p>Demonstrate sensibility and responsibility in pursuing a balance between the needs of humans and a sustainable environment.</p> <ul style="list-style-type: none"> Assume part of the collective responsibility for the impact of humans in the environment. Encourage their peers and members of their communities to participate in a project related to sustainability. Participate in the social and political systems that influence environmental policy in their community. Promote actions that are not injurious for the environment. 	Natural Environment
Unit D: Changes in Living Systems	<p>Explain that society and technology have both intended and unintended consequences for humans and the environment.</p> <ul style="list-style-type: none"> Assess habitat loss and the responsibility of society to protect the environment for future generations. Discuss in terms of scientific principles how reforestation projects change the direction of secondary succession in a natural ecosystem. 	Natural Environment
Science 20 Unit D: Changes in Living Systems	<p>Explain that science and technology are developed to meet societal needs and expand human capabilities.</p> <ul style="list-style-type: none"> Contrast the diet of people in developing countries and that of people in developed countries in terms of energy efficiency and environment impact, and describe ways to address potential food shortage in the future. 	Food, Health
Science 20 Unit D: Changes in Living Systems	<p>Explain that science and technology have both intended and unintended consequences for humans and the environment.</p> <ul style="list-style-type: none"> Discuss the use of water by society, the impact such use has on water quality and quantity in ecosystems, and the need for water purification and conservation, considering such things as manufacturing, the oil industry, agricultural systems, the mining industry and domestic water consumption. 	Water
Science 14 Unit D: Investigating Matter and Energy in the Environment	<p>Describe how the flow of matter in the biosphere is cyclical along characteristics pathways and can be disrupted by human activity.</p> <p>Analyze a local ecosystem in terms of its biotic and abiotic components, and describe factors of the equilibrium.</p>	Water, Energy, Natural Disasters, Natural Environment

CURRICULUM LINKS FOR ALBERTA

Grade/Subject	Expectations	Related Themes
Science 24 Unit C: Disease Defense and Human Health	Describe how human health is affected by societal and environmental factors, and describe the need for action by society to improve human health. <ul style="list-style-type: none"> • Describe how human diseases may arise from an interaction of variables, including poor nutrition, stress, pathogen and environmental contamination. • Analyze the relationship between social conditions and disease. 	Health
Biology 20 Unit A: Energy and Matter Exchange in the Biosphere	Explain that science and technology have both intended and unintended consequences for humans and the environment. <ul style="list-style-type: none"> • Discuss the use of water by society, the impact such use has on water quality and quantity in ecosystems, and the need for water purification and conservation. 	Water
Biology 20 Unit A: Energy and Matter Exchange in the Biosphere	Explain that science and technology have both intended and unintended consequences for humans and the environment. <ul style="list-style-type: none"> • Describe how human activities can have a disrupting influence on the balance in the biosphere of photosynthetic and cellular respiratory activities: fossil fuel combustion, depletion of stratospheric ozone, forest destruction. 	Natural Environment, Natural Disasters
Social Studies 20 Theme III: Quality of Life	Quality of life is increasingly affected by issues of global concern. <ul style="list-style-type: none"> • Choose several examples and study their impact on human populations, deforestation, desertification, pollution, greenhouse effect. There are issues of common global concern.	Natural Disasters, Natural Environment
Social Studies 20 Theme IV Alternative Futures: Possibilities for Change	<ul style="list-style-type: none"> • Study at least one issue of global concern in the following areas: food sources and distribution; energy sources, spread of disease. There are potential solutions to global concerns.	Health, Food , Energy

CURRICULUM LINKS FOR ALBERTA

Grade/Subject	Expectations	Related Themes
Environmental and Outdoor Education JH Environmental Core	<ul style="list-style-type: none"> Students will develop lifestyle strategies that foster contact with the natural world, encourage responsibility for global and local environment and encourage living in harmony with others. Students will demonstrate the understanding that environments change over time, by identifying and describing examples of the following concepts: Students will recognize changes that result from human use of environments, including: changes due to individual and group activity in the environment, changes that result from extraction or harvesting of natural resources, changes that result from addition of materials to the environments. 	Natural Disasters, Natural Environment
Science 30 Unit B: Chemistry and the Environment	Identify and explain how human activities and natural events contribute to the production of photochemical smog, the depletion of the ozone layer and increased concentrations of organic compounds in the environment.	Natural Environment
Science 30 Unit D: Energy and the Environment	<p>Compare the energy consumption of contemporary society with that of traditional cultures and pre-contact Aboriginal societies, and investigate and analyze the exponential growth of global energy consumption in recent history.</p> <p>Compare Canada's per-capita energy consumption with developed and developing countries and identify factors that affect consumption; e.g., economy, lifestyle, level of technology, geography, climate.</p> <p>Apply the concept of sustainable development to increasing the efficient use of energy; e.g., efficient use of energy in the home, in industry and in transportation.</p> <p>Explain the need to develop technologies that use renewable and nonrenewable energy sources to meet the increasing global demand.</p> <p>Describe the environmental impact of developing and using various energy sources; i.e., conventional oil, oil sands, solar power, wind power, biomass, hydroelectricity, coal burning power, nuclear power, geothermal.</p>	Energy

MANITOBA

Grade/Subject	Expectations	Related Themes
Senior 4: World Geography – a Human Perspective (Grade 12) Unit 3: World Food Supply: Production and Distribution	Unit III is designed for students to understand World Food Supply: Production and Distribution (4 weeks)	Food Security
Senior 2 Science (Grade 10) Unit 1: Dynamics of Ecosystems	S-0-2c-3b, 5c, 9c Students will understand the bioaccumulation of toxins and the harmful effects on consumers, both past and present.	Health, Natural Environment
Senior 4 Biology 40s (grade 12)	B12-0-P4- Recognize that humans have impacted and continue to impact the environment.	Natural Disasters
Senior 2: Science (Grade 10) Cluster 4: Weather dynamics	S-04-08: S will discuss potential consequences of climate change.	Natural Environment
Senior 4: World issues (Grade 12) Unit 5: the World of the Future	Unit V is designed to help students speculate about the future if current trends continue.	Water
Senior 2: North America – a Geographic Perspective (grade 10) Unit 8: Canadian, Continental and World Issues (integrated)	To help students explore and better understand the following ideas: <ul style="list-style-type: none"> • interrelationship and interdependence of local, Canadian, Continental, and world issues. 	Natural Environment
Senior 4: World Geography (grade 12) Unit 4: World Resources, Energy, and Environment (4 weeks)	The major goals of the Senior 4 World Geography curriculum are to help students explore and better understand the following ideas with reference to a world view: population characteristics, distribution, growth, and challenges; environmental management and protection, and economic growth in the context of sustainable development.	Energy
Grade 12 Global Issues: Citizenship and Sustainability	Students conduct inquiry into the social, political, environmental, and economic impact of contemporary and emerging global issues. Through their inquiry, students focus on questions of quality of life locally, nationally and globally. This course is based on the principles of active democratic citizenship, ecological literacy, critical media literacy, and ethical decision-making, and consolidates learning across the disciplines to empower students as agents of change for a sustainable and equitable future. As a mandatory component of the course, students plan and implement a community-based action-research project.	Natural Environment, Food Security, Health, Water, Energy

SASKATCHEWAN

Grade/Subject	Expectations	Related Themes
History 20 (grade 11) Unit Five: Global Issues	Consumption levels of the Industrialized Developed Nations Know that the consumption of energy per person in developed nations is more than 80 times greater than the consumption of citizens of the Sub-Saharan nations.	Food Security
Social Studies 20: World Issues (Grade 11) Unit two – Population	Students will know how to determine both human Fertility Rate and the Death Rate of a country and understand their significance.	Health
History 20 (Grade 11) Unit Five: Global Issues	Arrogance of Humanism Perspective: Students will know that proponents of this perspective maintain that humans did not create and do not understand nature and have placed nature in jeopardy.	Natural Disasters
History 20 (Grade 11) Unit Five: Global Issues	Understand how the nature of the relationship between humans and their environment could define the nature and quality of human life in the future.	Natural Environment
Biology 20 Unit 2: Ecological Organization	During the course of this inspection, students will see how Saskatchewan is a part of the larger global ecosystem, and how diverse the life, and life-support system, in the province really is. Points to be stressed are that the quality soil, air, and water provide the basis for healthy life and that human action has a disproportionately large effect on populations and ecosystems.	Water
Physics 30 (Grade 12) Core Unit III: Electricity D. Electric Power and energy	Identify the impact each main method used to produce electricity has on the environment.	Energy

QUEBEC CURRICULUM CONNECTIONS TO CLIMATE CHANGE

Secondary School Education, Cycle One

Social Sciences: Geography

COMPETENCY 1: *Understands the organization of a territory*: Grasps the meaning of human actions with regard to the territory, relates different geographic scales, uses cartographic language. The student identifies relevant elements of the organization of the territory by ensuring that they relate to the type of territory concerned correspond to the designated focus, are characteristic of the organization of the territory. The student represents his/her construction of the organization of the territory coherently by highlighting: connections among elements of the organization of the territory, connections among concepts, relationships between human actions and the organization of the territory. The student considers the organization of the territory as a whole by using scales of analysis appropriately to highlight: new phenomena and external influences.

COMPETENCY 2: *Interprets a territorial issue*: Describes the complexity of the territorial issue. The student cites elements that are relevant to the territorial issue by referring to: exact and specific elements, appropriate concepts. The student describes the dynamics of the territorial issue by showing: how the basic elements of the issue interact, connections between the concepts, power struggles. The student expresses a well-founded opinion when it is based on: several points of view, the relation among several scales of analysis, consideration of the consequences of the proposals for the territory consideration of individual and collective interests.

COMPETENCY 3: *Constructs his/her consciousness of global citizenship*: Evaluates solutions to global issues, Examines human actions in terms of the future to be able to considers the impact of human actions on the future of the planet by taking into account the consistency of these human actions with their underlying values, the relationship between these human actions and sustainable development the need for concerted action to solve global problems, the contribution of international rules, conventions and organizations The student defends his/her opinion by basing it on the effectiveness of the solutions proposed.

Social Sciences – History and Citizenship Education

COMPETENCY 1: *Examines social phenomena from a historical perspective*. Contemplates the past of social phenomena, Considers social phenomena in terms of duration. Looks at social phenomena in their complexity.

COMPETENCY 2: *Interprets social phenomena using the historical method*. Establishes the factual basis of social phenomena, explains social phenomena, puts his/her interpretation of social phenomena in perspective

COMPETENCY 3: *Constructs his/her consciousness of citizenship through the study of history*.

Languages – Secondary English Language Arts

COMPETENCY 1: *Uses language/talk to communicate and to learn*. Interacts with peers and teachers in specific learning contexts. Explores the social practices of the classroom and community in specific contexts.

Secondary School Education, Cycle Two

Social Sciences: Contemporary Economic Environment

COMPETENCY 1: *Interprets a problem of the contemporary world.* To encircle the problem, to analyze the problem, to envisage the problem in its entirety, to carry a glance criticizes on its approach. From the point of view of the rigor of the reasoning, the student: leans on facts bound to the problem; puts in relation of the facts in the explanation of the problem, use concepts in an appropriate way. From the point of view of the precision of the overview, the student: puts in relation of the constituent elements of the problem; find resemblances and differences in the manners the problem of which shows itself in the world, kick away world tendencies.

COMPETENCY 2: *Take position on a stake in the contemporary world.* Examine points of view relative to the stakes. The student: establishes connections between the points of view of the actors, their interests and their values.

Languages: Secondary English Language Arts

COMPETENCY 1: *Uses language/talk to communicate and to learn.* Interacts with peers and teacher in specific contexts.

ATLANTIC CANADA

Grade/Subject	Expectations	Related Themes
Grade 9 Atlantic Canada and the Global Village Unit 1: Physical Settings	<p>Link human activity to the natural resources of the Atlantic region.</p> <p>Students will be expected to research the issue of sustainability in one resource industry and suggest the steps that are necessary to achieve this. (1.4.9)</p>	Natural Resources (Fishery/Farming/Forestry) Sustainable Development
Grade 9 Atlantic Canada and the Global Village Unit 4: Technology	<p>Analyse the effect of technology on resource industries in Atlantic Canada</p> <p>Students will be expected to evaluate the environmental effects of technology in the resource Industries. (4.6.6)</p>	Water (dams); Tree and Potato Harvesting
Grade 9 Atlantic Canada and the Global Village Unit 5: Interdependence	<p>Examine and analyse how Atlantic0Canadians are members of the global community through different interconnected systems.</p> <p>Demonstrate an understanding that global interdependence and technological change affect sustainable living and cultural understanding.</p> <p>Students will be expected to discuss an environmental issue that impacts directly on Atlantic Canada and the global village. (5.2.6)</p>	Global Warming; Global Village and Natural Disasters
Grade 10 Science Unit 4: Sustainability of Ecosystems	<p>Students explore the concept of sustainability and ideally move toward a more sophisticated level of global thinking.</p> <p>Students will be expected to:</p> <ul style="list-style-type: none"> • Question and analyze how a paradigm shift in sustainability can change society's views • Identify, investigate, and defend a course of action on a multi-perspective social issue • Identify and describe peer review, Canadian research, and global projects where science and technology affect sustainable development • Diagnose and report the ecosystem's response to short-term stress and long-term change • Predict and analyze the impact of external factors on the sustainability of an ecosystem, using a variety of formats. 	Human Impact; Industrialization; Urbanisation

CURRICULUM LINKS FOR ATLANTIC CANADA

Grade/Subject	Expectations	Related Themes
<p>Grade 11 Biology Unit 2: Biodiversity</p>	<p>Analyse how individuals, society, and the environment are inter-dependent with scientific and technological endeavours. (117)</p> <p>Evaluate social issues related to the applications and limitations of science and technology, and explain decision in terms of advantages and disadvantages for sustainability, considering a variety of perspectives. (118)</p> <p>Evaluate relationships that affect the biodiversity and sustainability of life within the biosphere. (318)</p> <p>Students will be expected to:</p> <ul style="list-style-type: none"> • debate the merits of funding specific scientific or technological endeavours and not others; (117-4) • provide examples of how science and technology are an integral part of their lives and their community; (117-5) • propose courses of action on social issues related to science and technology, taking into account an array of perspective, including that of sustainability; (118-10) • evaluate Earth’s carrying capacity, considering human population growth and its demands on natural resources. (318-10) <p>Attitude Outcome: 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.</p>	<p>Ecosystems; Global Resources</p>

CURRICULUM LINKS FOR ATLANTIC CANADA

Grade/Subject	Expectations	Related Themes
<p>Grade 12 Global Geography All units</p> <p>Unit 1: Our Fragile Planet</p> <p>Unit 2: Perilous Processes: Our Planet at Risk</p> <p>Unit 5: Global Resources: The Good Earth</p> <p>Unit 6: Global Factory: For Whose Benefit?</p> <p>Unit 8: The Future Planet: Under New Management</p>	<p>Acknowledge that individually and collectively each person makes choices that have an impact upon the natural environment, locally and globally.</p> <p>Recognize, examine, and explain changing world conditions, and to identify and discuss emerging global trends.</p> <p>Students will be expected to appreciate the potential of critical situations facing the planet.</p> <p>Students will be expected to recognize human-made perils and that these create problems that threaten the capability of our planet to sustain life.</p> <p>Students will be expected to examine methods of managing consumption that enhance the conservation and preservation of renewable and non-renewable resources.</p> <p>Students will be expected to explain the evolving pattern of industrialization, global inequalities of production, consumption, and wealth, and their combined impact on the environment.</p> <p>Students will be expected to reflect upon previous learnings in this and other courses in order to identify resources and processes that help us to understand the biosphere, humanity's role as part of it, and our responsibility to protect it.</p>	<p>Gaia Hypothesis; plant and animal species decline; deforestation; desertification; natural disasters; climate change</p> <p>Greenhouse effect; ozone depletion; acid rain; management of resources; pollution</p>
<p>Grade 12 Global History Unit 5: Acknowledging Global Interdependence: The Legacy of the 20th Century</p>	<p>Students will be expected to:</p> <ul style="list-style-type: none"> • analyse and discuss the concept of global interdependence; • assess their own roles, responsibilities, and commitments in an interdependent world. 	