NATURAL ENVIRONMENTS

A woman holds her child amid debris in front of their cyclone-damaged home near the town of Kunyangon in Yangon Division.

In May 2008 in Myanmar, an estimated 1.5 million people are struggling 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. Up to 5,000 square kilometres of the densely populated Irrawaddy Delta, which bore the brunt of the storm, remain underwater. The displaced are living in congested shelters or in the open and lack access to drinking water, latrines, food and medical supplies. The conditions pose serious risks for outbreaks of infections and water-borne diseases.

INTRODUCTION

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

Forests can also, as we know, 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.

ACTIVITIES

The curricula links below are addressed in this theme. For an extensive list of relevant provincial expectations/outcomes, refer to Appendices A and B: Curriculum Links (pages 91 and 95), and Appendix I for links in Alberta, Saskatchewan, Manitoba and Quebec. .

Province	Course	Expectation/Learning Outcome
Ontario	SBI3U Biology, Grade 11 *Diversity of Living Things*	B1. Analyze the effects of various human activities on the diversity of living things
Ontario	SVN3M Environmental Science, Grade 11, University/College Preparation *Sustainable Agriculture and Forestry*	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 *Biomes*	Analyze the interactions between human activity and biomes, with reference to: • Deforestation • Desertification • Soil degradation • Species depletion
British Columbia	Sustainable Resources 12 *Forest Resources and Society*	Analyze current forest management practices.

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 G: Reflect and Act (page 104)

ACTIVITY

1. Explain that you will be discussing natural environments and how climate change can alter our global natural environments.

2. Distribute Appendix G: Reflect and Act on page 104 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: 15 minutes

Materials

- Reused paper for each student (personal white boards or laptops)
- Highlighters
- Student Handout #15: Amazing Amazon
  Clip #6: *In the Name of Progress* . This can be found on the UNICEF Teacher and student websites at **http://globalclassroom.unicef.ca/en/resources/resource_guide.htm** and **www.unicef.ca/climatechangeresources.**

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 D: The UN Convention on the Rights of the Child in Child-Friendly Language (page 101) for more information.

4. Distribute Student Handout #15: Amazing Amazon (page 63) 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 **http://globalclassroom.unicef.ca/en/resources/resource_guide.htm** and **www.unicef.ca/climatechangeresources**. This clip is about 15 minutes in length 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 #16: TREE cards
- Six sets of Student Handout #17: 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.

    a) The game consists of two decks of cards: The TREE cards — Student Handout #16 (page 64) and the SITUATION cards — Student Handout #17 (page 66). Place both decks face down and side-by-side, in the middle of the group.
    b) To begin, one player randomly hands out four TREE cards to each player.
    c) 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.
    d) If the SITUATION card reads ALL PLAY, this situation affects all players. All players must do what is asked on the card.
    e) 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 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

    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.

YOUTH TAKE ACTION

Challenge for Change!

Distribute Student Handout #14: Youth Take Action (page 62) 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 E: Culminating Task Rubric on page 103.

BACKGROUNDER NATURAL ENVIRONMENTS

Planting trees in Ethiopia

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 landfil.

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 children[3]

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 evicted[4]

Ethiopia today

At the turn of the 20th century, *40% of Ethiopia was covered by forest. Today that figure is 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 **http://www.unicef.org.uk/campaigns/publications/pdf/climate-change.pdf**.

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 #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.

1. Research global forest preservation. View the following clips:
   - Clip #7: *Destruction of the Rainforests* (**http://globalclassroom.unicef.ca/en/resources/resource_guide.htm** and student link at **www.unicef.ca/climatechangeresources**)
   - Clip #8: *Save Rainforests, Save Lives* (**http://globalclassroom.unicef.ca/en/resources/resource_guide.htm** and student link at **www.unicef.ca/climatechangeresources**)

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://globalclassroom.unicef.ca/en/resources/resource_guide.htm** and on the UNICEF Student link at **www.unicef.ca/climatechangeresources**

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**.

2. 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.

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**.

3. Trees and plants act as carbon sinks to store carbon dioxide and to produce oxygen. Research a national tree planting organization.

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

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**.

Kiilinik 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**.

Student Handout #15

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 #16

TREE CARDS

ASH	ASH
ASH	ASH
ASPEN	ASPEN
ASPEN	ASPEN
BIRCH	BIRCH
BIRCH	BIRCH
CEDAR	CEDAR
CEDAR	CEDAR
CHERRY	CHERRY
CHERRY	CHERRY
ELM	ELM
ELM	ELM
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 #17

SITUATION CARDS

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

SITUATION CARDS

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. Discard 2 TREES	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. Collect 2 TREES
Over 2,000 tropical forest plants have been identified with some anti-cancer elements, but many plants are becoming extinct before being researched. Discard 2 TREES	By holding soil in place and reducing run-off from streams, trees prevent soil erosion, control avalanches and mitigate desertification. Collect 2 TREES
Deforestation is contributing to flash-flooding and the destruction of homes and crops directly affecting the lives of children. Discard 1 TREE	Tropical hardwood floors are an inexpensive way to renovate but the environmental impact is the loss of trees from the rainforest. Discard 3 TREES
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. Discard 2 TREES	In Sumatra, forests are being converted to palm oil; the forest is burnt, the habitat is destroyed, and the ground is drained. Discard 2 TREES
ALL PLAY At the turn of the 20th century, 40% of Ethiopia was covered by forest. Today it's just 3%. Discard 3 TREES	Deforestation is jeopardizing livelihoods and taking its toll on children, especially underdeveloped regions. Discard 2 TREES
In 2007, Ethiopia pledged to plant 60 million trees, with the help of children and youth. Collect 2 TREES	UNICEF is contributing to the planting of at least 20 million trees in Ethiopia. Collect 2 TREES

SITUATION CARDS

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