A TEACHER'S GUIDE TO

FORCE OF NATURE

THE DAVID SUZUKI MOVIE

Population, Consumption and Sustainable Development

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Introduction

The purpose of this guide is to encourage teachers of grades 9–12 to incorporate the National Film Board documentary ***Force of Nature*** into their lesson plan by identifying where and how the film can support current curriculum expectations. In addition to connecting film content with subject outcomes, the guide offers a number of suggestions and activities to help teachers extend the discussion of a variety of themes, organized under the following headings:

Population, Consumption and Sustainable Development

Internment, Hiroshima, Human Rights and the Next Generation

Science and Technology in Society

Towards a New Perspective

These units can be explored selectively or collectively, depending on their relevance to the curriculum for which the teacher is responsible.

Each unit is accompanied by a table that identifies the activities therein, provides a description of each of these activities, and indicates the particular pedagogy employed. A second and third table provide direction as to where the activities may be incorporated into the curriculum by identifying the relevant general and specific curriculum links for each of the provinces and territories.

Force of Nature is a powerful ninety-minute documentary based on David Suzuki's Legacy Lecture. Dr. Suzuki described this address, presented in 2010 to a live audience at UBC's Chan Centre, as "his last chance to say what he wants." The film effectively punctuates the lecture with scenes from his personal life and news footage chronicling major political, scientific and social events of the past seventy years. The result is a highly relevant, thought-provoking and entertaining viewing experience that students will find both interesting and inspiring.

While the film explores a range of themes related to the questions of "who we are, why we are here and where we are headed as a species," Dr. Suzuki's core message is clear: humans have exhausted the limits of the biosphere and it is imperative that we rethink our relationship with the natural world. Though much of the narrative is devoted to articulating how our species has altered the physical, biological and chemical integrity of the planet, he does offer viewers a blueprint for survival and his assurance that the same qualities that have made humanity a force of nature will guide us on a new pathway to a future full of meaning and real wealth.

Force of Nature examines a number of key themes and concepts addressed in subject areas across the high school curriculum, including:

- **Population, Consumption and the Global Economy**
- **Sustainable Development**
- **Science and Technology in Society**
- **Racism and Human Rights**
- **Aboriginal Perspectives and Traditional Ecological Knowledge**
- **Scientific Literacy and the Media**

Selected excerpts from the documentary can be used to support the teaching of these topics individually or, when shown in its entirety, the film offers an extremely effective interdisciplinary examination of the ecological crisis at hand and the role of sustainable development.

"A global economy built on supplying an ever-expanding consumer demand exploits the entire planet as a source of raw materials. So when you take all that together—our numbers, our vast technological muscle power, our exploding consumptive demand and a global economy—we have become a new kind of force on the planet. One species. 'Us' is single-handedly altering the biological, physical and chemical features of the planet in a mere instant of cosmic time. We have become a force of nature." –David Suzuki

In ***Force of Nature***, David Suzuki urges his audience to respond to the critical challenges resulting from the rapid growth of the world's population and the corresponding increase in consumption of the world's resources. This consumption, according to Suzuki, is made possible by the globalization of the economy, which according to its critics is leading to increased hunger, the undermining of local cultures and severe ecological crisis. Dr. Suzuki and others have argued that a strategy based on the principles of sustainable development provides the best response to these perceived destructive trends.

The school curriculum of all Canadian provinces and territories requires students to examine these trends. ***Force of Nature*** provides a provocative and challenging introduction to these issues, and the following activities are intended to help students develop the skills of critical thinking, co-operative learning and creative problem solving in the analysis of the causes and consequences of these trends.

The chart below provides a quick reference to the relevant curricula in each province and territory. A more detailed curriculum matrix is found in the Appendix.

Province/Territory	Curriculum Links, Grades 10–12
Alberta	Science; Social Studies; Environmental Education
British Columbia	Science; Civics; Geography; Science & Technology; Social Studies; Sustainable Resources
Manitoba	Arts; Science; Social Studies; English Language Arts
New Brunswick	Science, History; Social Studies; English Language Arts
Newfoundland and Labrador	Science; Social Studies; Economics; English Language Arts
Northwest Territories	Science; Social Studies; Environmental Education
Nova Scotia	Social Studies; Geography; History; Technological Education; Science; Economics
Nunavut	Science; Social Studies; Environmental Education
Ontario	Economics; Geography; Civics; History; Political Science; Science; English; Arts
Prince Edward Island	Agriscience; English Language Arts; Economics; Geography
Quebec	Personal Development; Social Sciences; Mathematics & Technology; Cross-Curricular Competencies
Saskatchewan	Social Studies; History; Science; English Language Arts
Yukon	Science; Civics; Geography; Science & Technology; Social Studies; Sustainable Resources

A Summary of Activities

UNIT SEGMENT	ACTIVITY	DESCRIPTION	PEDAGOGY
Population Growth	1. Snowshoe Hare and Lynx Population in Canada: A Case Study	Students analyze real population data that illustrates how available resources determine the number and type of organisms that an environment can support.	Case study approach Integrated learning
	2. The Lesson of the Kaibab Deer	Students examine real data to investigate the causes and consequences of exponential growth in populations.	Case study approach Integrated learning
	3. World Population Video	Students view a video overview of population growth from 1AD to the present and infer future population growth.	Video Simulation Integrated Learning
	4. Population Circle	Students examine the concept of exponential growth as it applies to human populations.	Experiential learning Integrated learning
	5. Human Population & Dr. Suzuki's Test Tube	Students examine the concept of exponential growth and the carrying capacity of the planet.	Model analysis
	6. Power of the Pyramids	Students construct and interpret population pyramids.	Case study approach Integrated learning
	7. Lessons from the Past	Students explore the consequences of unchecked population growth and consumption on the early civilizations of Easter Island.	Case study approach
	8. Consequence Chart	Students begin a conversation about the implications of a growing population.	Guided inquiry
Globalization of the Economy	1. Causes of Trade Globalization	Students identify those trends or developments that have resulted in the integration of national economies into the international economy.	Co-operative learning
	2. The Story of Stuff	Students examine the life cycle of the products we consume and the "cost" at each stage of the process.	Video analysis Detecting bias
	3. Full Cost Accounting	Students examine the concept of Full Cost Accounting by selecting and analyzing the "costs" of a given product.	Shared responsibility for learning Use of graphic organizers
	4 .Effects of Trade Globalization	Students consider some of the effects of trade globalization on agriculture and the garment industry.	Case study approach Values clarification
Overpopulation, Technology & a Global Economy	1. The Blue Fin Tuna Auction	Students examine how overpopulation, technology and the global economy have threatened the blue fin population.	Video analysis Case study approach
	2. Ecological Footprint	Students examine their individual and collective ecological footprint.	Experiential learning Interdisciplinary learning Acting on learning

UNIT SEGMENT	ACTIVITY	DESCRIPTION	PEDAGOGY
Identifying Solutions	1. Sustainable Development: A Framework for Analysis	Students examine the concept of sustainable development.	Peer teaching Concept mapping/Systems thinking
	2. Trade Globalization and Sustainable Development	Students explore the interplay among the economic, social and environmental forces involved in global trade.	Concept mapping/Systems thinking
	3.Incentives/ Disincentives	Students identify incentives for promoting sustainable consumption.	Brainstorming
	4. Gross Domestic Product (GDP) as a Measure of Well Being	Students explore the merits of GDP as a measure of a country's well-being.	Values clarification
	5. Alternatives to GDP	Students examine a number of alternatives to GDP as a measurement of well-being.	Collaborate learning
	6. Roundtable on Population and Consumption	Students examine responses to current challenges.	Experiential learning Role-play simulation
Taking Action	1. Goal Mountain	Students identify global, local and individual actions to meet contemporary challenges.	Using graphic organizers
	2. Support an Organization of Your Choice	Students evaluate and consider support for an organization or organizations promoting sustainable development.	Research, evaluation and action
	3. Bottled Water	Examine the reasons for the popularity of bottled water; the consumption pattern; the effect of bottled water on the environment; and possible reponses to the issue of bottled water.	Action project

Selected General Learning Outcomes

The activities in this teaching guide address the following selected general learning outcomes (knowledge, skills and attitudes):

- Evaluate the impact of the global economy on the environment and peoples of the Americas;
- Understand how technology has given humans the power to change the world's environment significantly and how the impact of the growing world population, with increasing demands on the environment, is raising many concerns;
- Explain the mechanisms involved in the change of populations over time;
- Analyze multiple perspectives on sustainability and prosperity in an increasingly globalized world;
- Outline the challenges impacting the health and sustainability of forest resources in British Columbia;
- Develop consciousness of global citizenship;
- Explore various global issues within the context of sustainable development;
- Examine population distribution, density and rates of growth with a view to ascertaining the planet's capability to support and sustain life;
- Interpret, select and combine information using a variety of strategies, resources and technologies;
- Understand the effects of globalization on individuals and nations;
- Implement a plan for action on a selected local, provincial, national or international civic issue;
- Explore understandings of contemporary economic globalization;
- Use appropriate presentation software to demonstrate personal understandings;
- Collaborate in groups to solve problems;
- Communicate effectively to express a point of view in a variety of situations;
- Demonstrate leadership by engaging in actions that enhance personal and community well-being.

1. Population Growth

"It took all of human existence to reach a population of 1 billion people early in the 19th century. Then in less than two centuries, it shot almost straight up past 6.8 billion." –David Suzuki

Activity 1

Snowshoe Hare and Lynx Population in Canada: A Case Study

Purpose: Students analyze real population data that illustrates how available resources determine the number and type of organisms that an environment can support. Students then apply this lesson from nature to better appreciate the current human population crisis and its inevitable consequences as described by Dr. Suzuki in the film.

Background: Since the late 18th century, the Hudson's Bay Company has kept detailed company records of the number of snowshoe hare and lynx pelts harvested each year by trappers and hunters. The data shows a cyclical pattern of boom and bust in the snowshoe hare population followed closely by similar peaks and valleys in the number of lynx. Native Americans have observed the up-and-down cycle of the hare and lynx in Canada's north for centuries. Today there are three competing theories that explain this consistent, cyclical pattern. More information on the theories and the snowshoe hare and Canada lynx relationship can be found at <pzweb.harvard.edu/ucp/curriculum/ecosystems/s6_res_lynxhare.pdf>.

Procedure:

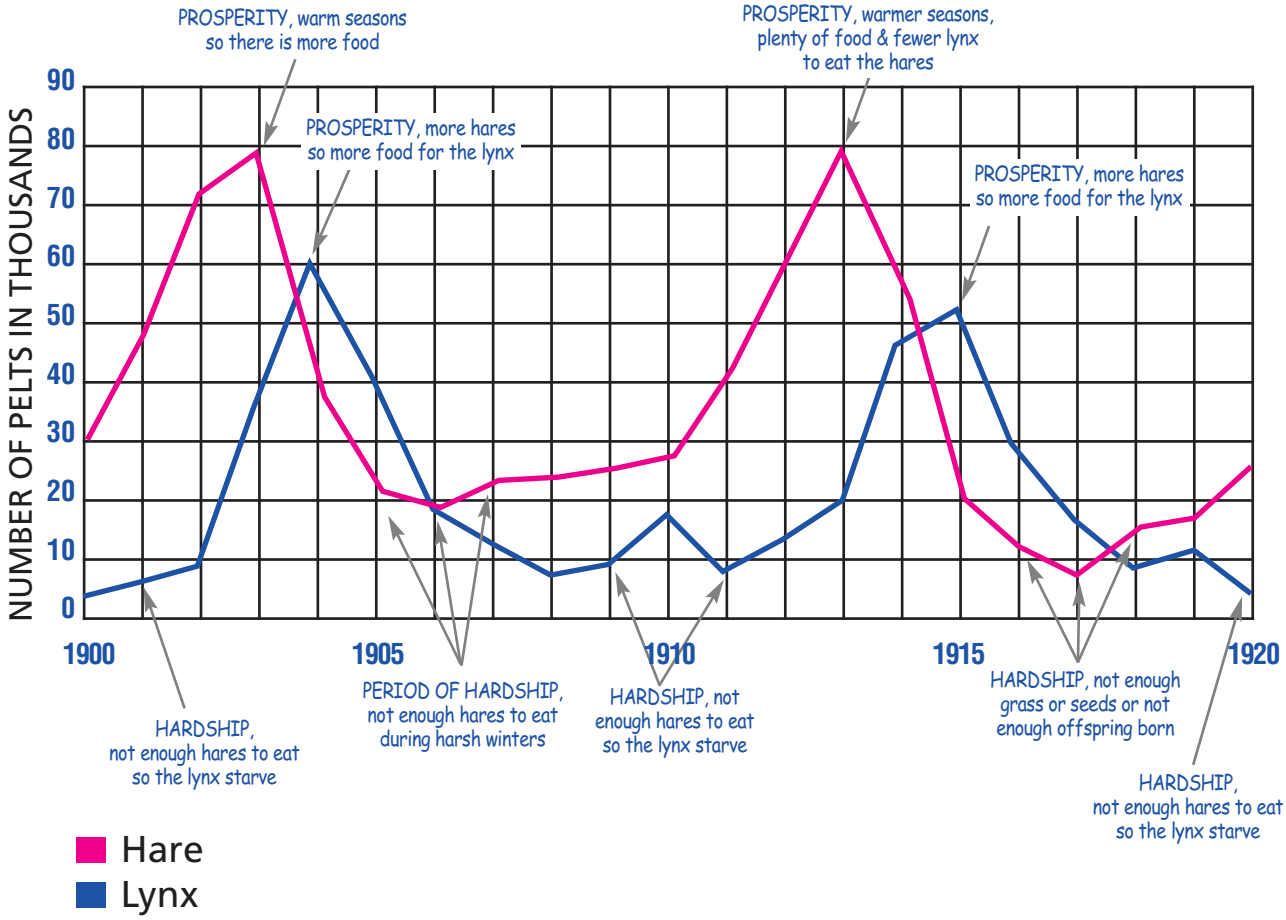
- Students plot the data provided in the accompanying table (see below) by placing the year on the X-axis and the population numbers on the Y-axis.
- Students describe the patterns they see emerging from the completed graph.

Analysis:

- Students explain the up-and-down pattern revealed on their graphs in terms of environmental resistance and carrying capacity. The following questions will guide their analysis:
  - The hare population increases over time until it reaches a peak. Explain why the number of hares is increasing during this time period.
  - After it peaks, the hare population begins to decrease. What reasons can you suggest for the decline?
  - When the hare population increases, what happens to the lynx population? Why?
  - Do the peaks in the lynx graph overlap exactly with the peaks in the hare's line? Explain.
  - Look at the lynx population between 1887 and 1889. What is happening to the hares at this time? Do you think that the presence of more lynx is helping or harming the hare population? Explain.
  - Look at the change in the lynx population from 1915 to 1917. What reasons can you suggest for this decline?
  - Place a horizontal line on the graph to represent the carrying capacity for these populations.
  - Would you assert that this graph demonstrates stable or unstable populations over the period of time represented? Explain.
  - Do you think a graph of these two populations from 1937 to today would look the same? Explain.

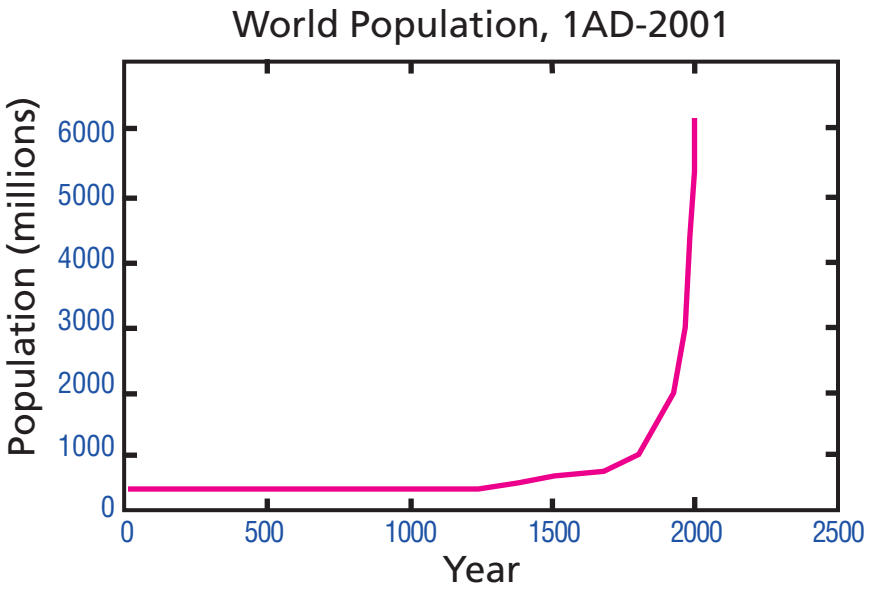
Students should record their thoughts and ideas directly on their graphs as in the example below:

Snow Shoe Hare and Lynx Population in Canada: A Case Study



Further Discussion:

How does the pattern of the snowshoe hare/ Canada lynx graph differ from the pattern of the adjacent human population graph? Explain.



Snowshoe Hare and Lynx Population in Canada (in thousands)

YEAR	HARE	LYNX	YEAR	HARE	LYNX
1845	20	32	1893	52	37
1847	20	50	1895	83	50
1849	52	12	1897	18	35
1851	83	10	1899	10	12
1853	64	13	1901	9	12
1855	68	36	1903	65	25
1857	83	15	1905	45	62
1859	12	12	1907	30	49
1861	36	6	1909	25	7
1863	150	6	1911	27	7
1865	110	65	1913	77	20
1867	60	70	1915	25	43
1869	7	40	1917	10	11
1871	10	9	1919	10	6
1873	70	20	1921	46	20
1875	100	34	1923	80	37
1877	92	45	1925	20	43
1879	70	40	1927	8	50
1881	10	15	1929	6	30
1883	11	15	1931	6	15
1885	137	60	1933	20	18
1887	137	80	1935	83	40
1889	18	26	1937	12	48
1891	22	18			

Activity 2:
The Lesson of the Kaibab Deer

Purpose: Students examine real data to investigate the causes and consequences of exponential growth in populations.

Background: Human attempts to mitigate environmental resistance within an ecosystem for the benefit of one population over others have often had the opposite effect. In one classic example, such efforts were made by wildlife managers in a proactive effort to protect the deer population of the Kaibab Plateau in Arizona. In this activity, students analyze the long-term effects of a well-documented population management practice within the Grand Canyon National Game Preserve and apply their findings to the current human population crisis and its inevitable consequences as described in the film by Dr. Suzuki.

Prior to 1905, the deer population on the Kaibab Plateau was estimated at 4,000. The carrying capacity of the range was estimated to be about 30,000 deer. On November 28th, 1906, the Grand Canyon National Game Preserve was established by President Theodore Roosevelt to protect what he referred to as the "finest deer herd in America."

Unfortunately, by this time the Kaibab forest area had already been overgrazed by sheep, cattle and horses. Most of the tall grasses had been eliminated. To protect the deer, all hunting was immediately banned. The Forest Service also initiated an extermination program to remove the predators of the deer. Between 1907 and 1939, 816 mountain lions, 20 wolves, 7,388 coyotes and more than 500 bobcats were killed.

Signs that the size of the deer population was growing out of control began to appear as early as 1920. The range was beginning to deteriorate rapidly, and so the Forest Service responded by reducing the number of livestock grazing permits it granted. Unfortunately, by 1923 the deer population was on the verge of starvation and the range conditions were described as "deplorable."

The Kaibab Deer Investigating Committee recommended that all livestock not owned by local residents be removed immediately from the range and that the number of deer be cut in half as quickly as possible. Hunting was reopened and during the fall of 1924, 675 deer were killed by hunters. However, this number represented merely one-tenth of the fawns born that spring. Over the next two winters, it is estimated that 60,000 deer starved to death.

Today, the Arizona Game Commission carefully manages the Kaibab area with regulations geared to specific local needs. Hunting permits are issued to keep the deer in balance with their range. Predators are protected to help keep herds in balance with food supplies.

Procedure:

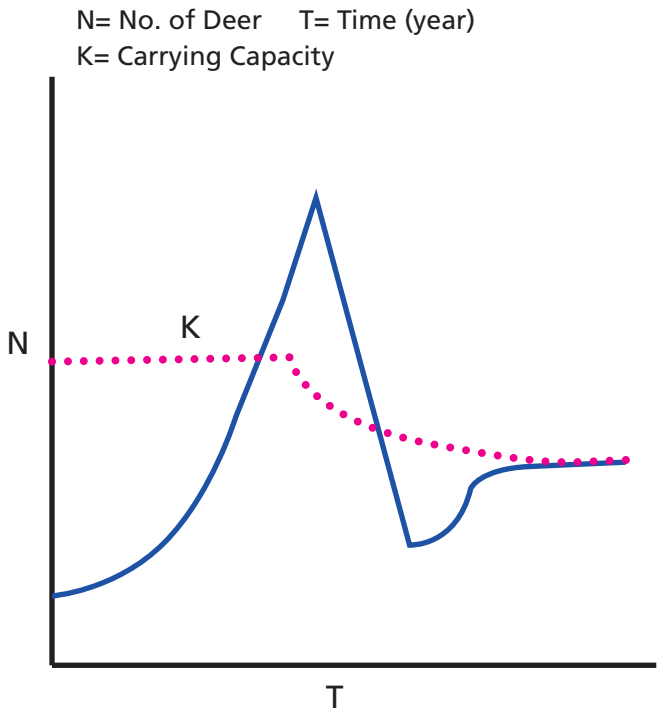
- Students analyze the population data provided below. The questions below will guide their analysis. Teachers may choose to have students plot the data.
- Students use their findings to explore the implications of the human population graph.

Analysis:

- During 1906 and 1907, what two methods did the Forest Service use to protect the Kaibab deer? Were these methods successful? Use the data from above to support your answer.
- Why do you suppose the population of deer declined in 1925, despite the elimination of predators?
- How would you explain the deer population of only 4,000 in 1900 when the plateau had a carrying capacity estimated at 30,000?
- Why did the deer population decline in the years after 1924?
- Some observers have claimed that the population increase and subsequent crash of the deer population would have occurred even if the predator-removal efforts had not taken place. Based on the previous investigation of the snowshoe hare-Canada lynx population, do you agree or disagree with this statement?

- It appears that while the deer population may have begun to recover, the carrying capacity has not. Why is the carrying capacity lower than it was in 1905 and why is it not recovering?
- Summarize the causes and consequences of the exponential growth in the deer population between 1900 and 1924.

Kaibab Deer Population: Kaibab Plateau, Arizona, 1905–1939

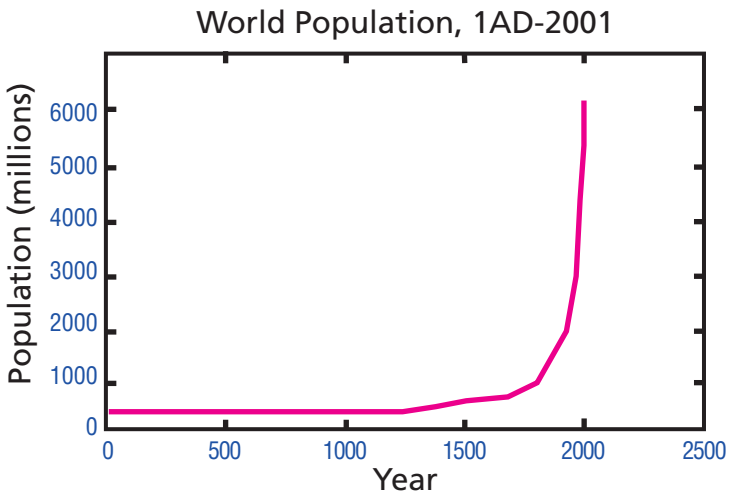


DATA TABLE

Year	Deer Population
1905	4,000
1910	9,000
1915	25,000
1920	65,000
1924	100,000
1925	60,000
1926	40,000
1927	37,000
1928	35,000
1929	30,000
1930	25,000
1931	20,000
1935	18,000
1939	10,000

Further Discussion:

How does the pattern of the graph of the Kaibab Deer population compare to the human population graph below? Explain.



Note: More information on the Kaibab Deer story can be found at <depts.alverno.edu/nsmt/youngcc/research/kaibab/story1.html>.

Activity 3:
World Population Video

Purpose: To provide an overview of population growth from 1 AD to the present and to infer future population growth.

Background: Dr. Suzuki uses the analogy of bacteria growth in a test tube to illustrate the concept of exponential population growth. The seven-minute video *World Population: A Graphic Simulation of the History of Human Population Growth* (Population Connection, 2003, worldof7billion.org/images/uploads/DVD.pdf) uses lights on a map of the world to show the rate of growth of the world's population as well as the distribution of the population from 1 AD to the present and beyond. You will find the link to the video in the Lesson Plan at <populationconnection.org/site/PageServer?pagename=issues_main>.

Procedure:

- The video is accompanied by a lesson plan that suggests an introductory viewing of the video, followed by a second guided viewing in which students look for information that will allow them to complete the student worksheet provided, followed by a class discussion. The teacher may start the DVD and pause for discussion as they go over the questions.

- A second worksheet asks students to examine the effect on population growth of death-causing events (wars, natural disasters, accidents, diseases, etc.) taking place around the world.

Activity 4:
Population Circle

Purpose: To illustrate the concept of exponential growth as it applies to human populations.

Background: Students may know that our population is approaching seven billion and that the rate of growth has dramatically increased in recent years, but it may be difficult for them to internalize this information. The activity that follows, developed by the grassroots organization Population Connection, takes advantage of the power of simulations to provide a visible demonstration of the rate of population growth over the last 510 years.

Procedure:

- The activity requires a room that will allow a class of up to twenty-eight students to form a circle. Download the activity at <worldof7billion.org/images/uploads/w7b_Population_Circle.pdf> and carry out the activity as instructed. Note that the numbers can be adjusted according to the size of the class.

Activity 5:

Human Population and Dr. Suzuki's Test Tube

Purpose: To illustrate the concept of exponential growth.

Background: Dr. Suzuki suggests that we are at the eleventh hour in trying to balance human population with the carrying capacity of the planet. Time is running out. In this presentation the planet is represented by a test tube and the human population by bacteria placed in the test tube.

Procedure:

- View the video at <interactive.nfb.ca/#/testtube> and discuss the following:
  - Why is a test tube an appropriate representation of the planet?
  - Why are bacteria an appropriate representation of population growth?
  - What is meant by exponential growth?
  - In terms of population, what is the carrying capacity of the planet? Where are we at?

Activity 6:

Power of the Pyramids

Purpose: To construct and interpret population pyramids and discuss differences in population growth rates among several different countries.

Background: The rate of population growth varies significantly from country to country and more generally between the developed and developing world. An examination of population pyramids helps students understand the differences in these growth rates and enables them to discuss the reasons for and consequences of this uneven growth.

Procedure:

- Download "The Power of the Pyramids," developed by Population Connection, at <populationeducation.org/media/upload/activity-power_of_the_pyramids.pdf> and follow the instructions therein. Teachers may choose to make a transparency of the population pyramids provided as a reference in discussing the issues raised by the activity.

Activity 7:

Lessons from the Past

Purpose: Students explore the consequences of unchecked population growth and consumption on the early civilizations of Easter Island.

Background: Easter Island Syndrome is a term that has come to describe a series of events that led to the disappearance of some of human history's most impressive early civilizations. The story of Easter Island provides further proof of the destructive power humans can exert as a force of nature.

Procedure:

- After reading the case study below, students will identify what caused the civilization on Easter Island to collapse and appreciate the lessons inherent in this story for Canada and the rest of the world. The questions provided can be used to help guide the discussion.

WILL CANADA GO THE WAY OF EASTER ISLAND?

By Andrew Nikiforuk

To most business people, Easter Island is a remote and exotic locale with some pretty impressive statues. But to James Brander, an economist at the University of British Columbia, it's an interesting case of too much growth and not enough sense.

In fact, the demise of the island's once prosperous civilization is a surprisingly modern fable about economic progress and resource degradation, with pointed lessons for Canada. For in spite of all its technology and sophistication, Canada remains a vast northern island that is still very dependent on trees, rocks, fossil fuels and wheat for its high standard of living.

In a lecture given recently as part of Industry Canada's Distinguished Speakers in Economics series, Brander spelled out what business people may soon refer to as the "Easter Island Syndrome" or the "Polynesian Bust."

Paradise Found

His story begins in 400 AD, when forty or so Polynesians first settled the island, which is located 3,700 kilometres off the coast of Chile. These economic pioneers immediately recognized the richness of the island's natural capital: the palm forest furnished the wood for large canoes that, in turn, were used to catch fish and dolphins. Birds that nested in the forest also provided fine dinners.

Blessed with this abundance, the people prospered and multiplied and cut down more trees. More canoes led to more fish, and so on. If Easter Island had had a finance minister, he would have recorded a rising GDP. He might even have talked of "new ages" or "virtuous cycles" or "prosperity for our times." And with all this growth, the island's clans started to employ thousands of people to carve impassive statues.

But Easter Island's GDP told only one side of the story. By 900 AD the island's slow-growing forests (each Jubaea palm takes forty to sixty years to mature) were looking rather patchy. And by 1400, when the population peaked at 10,000, the entire palm forest had been felled. It seems that no one bothered to replant trees on Easter Island because only someone's grandchildren would have reaped the benefits. This sad tale proves that libertarian and short-sighted economics are fairly ancient concepts.

The disappearance of the twenty-four-metre-tall palms, of course, affected all the island's natural capital, including tasty bird dinners (no nesting places), fewer crops (soil erosion) and even the availability of clean water.

Had any naysayer tried to question all this progress, he or she probably would have been "overridden by vested interests of carvers, bureaucrats and chiefs, whose jobs depended on continued deforestation," as the ecologist Jared Diamond recently wrote.

Until a full-blown crisis erupted, the GDP would have painted a deceptively rosy picture. "If all you are doing is looking at levels of output," says Brander, "you can miss the decline of the resource supporting those gains."

Between 1400 and 1500, a Malthusian correction descended on the island and all stone carving ceased. People started to live in caves or fortified villages, and a new tool entered the archaeological record: a spearhead or dagger. Rwanda-style chaos reigned as hordes of people battled over scarce resources.

Flesh Eaters

Not surprisingly, a new food product entered the marketplace: human flesh. And by the time the first Europeans visited the grassy island, the population had dwindled to about 3,000 improvident souls who no longer remembered how it took an army of 500 people to erect one statue with technology made from forests that no longer existed.

"The caution is simple," says Brander. "It is pretty easy to abuse a resource base and suffer economic decline as a result." The Maya, the Anasazi of the U.S. Southwest, and people living in Mesopotamia all learned similar economic lessons.

Canada, of course, is not in decline and GDP is certainly up, but "we are using our natural resources at a rate that is disturbing," says Brander. Like Easter Island, this nation has no honest index to record or highlight resource depletion.

Not surprisingly, the thirty or so government types and planners that attended Brander's talk displayed the usual range of reactions. Some were concerned, some sat on the fence. The rest, like Wall Street editorialists, were deeply skeptical. "GDP is up," they said.

And so it was on Easter Island too.

Andrew Nikiforuk, author of the bestselling book
Tar Sands: Dirty Oil and the Future of a Continent (Greystone Books, 2008).

Discussion Questions:

- Where is Easter Island located?
- What is Easter Island's best-known attraction?
- What similarities does James Brander see between the economies of the early civilizations on Easter Island and the Canada of today?
- Outline the sequence of events as they unfolded on Easter Island between:
  a. 400 and 1400 AD
  b. 1400 and 1500 AD
- What does the author mean by a "Malthusian correction"?
- Summarize what James Brander means by the phrase "Easter Island Syndrome."
- What is the message in this essay for Canada?
- Are we listening?

Activity 8:

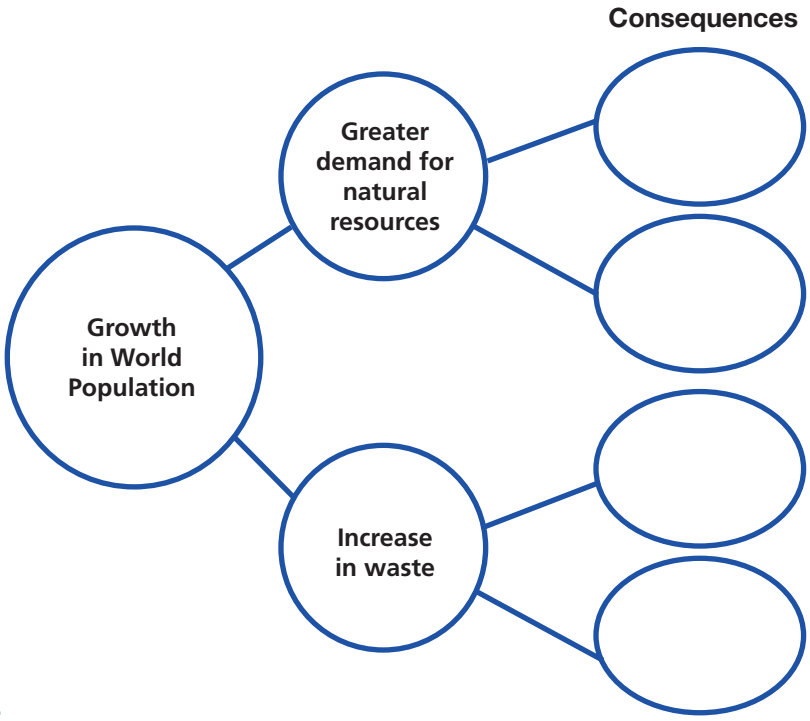
Consequence Chart

Purpose: The following activity is designed to alert students and to begin a conversation about the implications of a growing population.

Background: Although challenged by some, the prevailing wisdom suggests that a growing population will mean: greater demands on natural resources (forests, oceans, farmland); an increased demand for fossil fuels; greater waste; and shrinking living space. Each of these effects, if realized, will have further consequences for the planet and its people. The activity below is intended to let students hypothesize as to possible consequences of these trends and to check their hypotheses against the projections of others.

Procedure:

- Have students complete the chart below, individually or as a teacher-directed class exercise, in order to identify and outline the flow of consequences that may result if the world's population growth goes unchecked. Add layers of consequences as required and consult the variety of articles on the website Global Issues <globalissues.org/issue/198/human-population> to test the students' hypotheses against the findings and conclusions therein.



Resources:

World Resource Institute – Earth Trends – "Population & Consumption": earthtrends.wri.org/updates/node/360
World Resource Institute – Earth Trends –"Toxic Trade: The Real Cost of Electronic Waste Exports from the United States": earthtrends.wri.org/features/view_feature.php?fid=66&theme=4

Other Teaching Suggestions:

It has been suggested that we live in the age of the J-curve. Plot the following over time to illustrate the meaning of this observation:

- Population growth
- Consumption of fossil fuels
- Production of CO_2
- Loss of habitat
- Urbanization

2. Globalization of the Economy

"By focusing on growth—growth!—we fail to ask the important questions, like how much is enough? Are there no limits? Are we happier with all this stuff? What is an economy for?" –David Suzuki

Activity 1:
Causes of Trade Globalization

Purpose: To identify the trends or developments that have resulted in the integration of national economies into the international economy.

Background: While world or international trade has been a feature of the economic landscape for some time, the emergence of a borderless world characterized by the increasing flow of goods, capital, services and labour across borders is a fairly recent phenomenon.

Certain trends in the latter part of the 20th century have heightened the rate and the extent of economic globalization. Various technological trends in transportation and communication have had the effect of shrinking the world, while the emergence of multinationals or transnational corporations has enlarged the playing field of a growing number of companies. The result is an increasingly interdependent world. The purpose of this activity is to have students identify and discuss these trends.

Procedure:

- Use a jigsaw strategy to have students research and report on those trends that have contributed to trade globalization. Assign groups to become the "experts" on each of the following topics or trends. (See "Jigsaw Classroom" at <jigsaw.org> for directions on the jigsaw approach.) The websites cited provide information on each of the topics, but students should consult other resources as well.

Resources:

Globalization 101 at: globalization101.org
Improvements in technology: globalization101.org/issue_main/technology
Growth of multinationals or transnationals: eclac.cl/ddpe/agenda/4/15304/Globa-trans-corp.pdf
Improvements in transportation and our ability to move goods:
people.hofstra.edu/jean-paul_rodrigue/downloads/transportation%20and%20globalization.pdf

Activity 2:
The Story of Stuff

Purpose: To examine the life cycle of the products we consume and the "cost" at each stage of the process.

Background: Dr. Suzuki argues that we have created "a global economy built on supplying an ever-expanding consumer demand [that] exploits the entire planet as a source of raw materials." If this is the case, we need to determine to what extent we have become a nation of consumers; the reasons for our consumption patterns; the process by which these consumer goods arrive on the store shelves; the ultimate fate of these goods; the costs at each stage; and what we might do to change the culture of consumption.

Procedure:

- Download and have students watch the video *The Story of Stuff* at <storyofstuff.com>. Have students complete the following organizer in preparation for class discussion.

The Linear System and the Materials Economy

STAGE IN SYSTEM	WHAT HAPPENS	COST (OUTSIDE OUR FIELD OF VISION)
Extraction		
Production		
Distribution		
Consumption		
Disposal		

The following may guide class discussion:

- What is meant by a linear system? A finite planet? How are the two incompatible?
- What does a "closed-loop" process mean and how would it change the present arrangement?
- What is meant by "We identify ourselves as consumers?" How did this culture of consumerism emerge? What can we do about it?
- What makes the video an effective tool in promoting the message contained therein? Is it a balanced presentation? Should it include other perspectives? What perspectives are missing?

Extensions:

- The Story of Stuff website also includes the videos *The Story of Bottled Water, The Story of Cosmetics* and *The Story of Electronics*, which have relevance for the daily lives of students and may serve to supplement the above activity.
- The Technology Loop <techloop.ca> developed by Hewlett-Packard and Learning for a Sustainable Future contains a series of lesson plans that help students . . .
  - Understand the social and environmental impacts and opportunities involved in the life cycle of electronics;
  - Choose, use and dispose of technological products responsibly;
  - Analyze the life cycle of a common object;
  - Communicate suggestions for improving everyday objects to the company that manufactures them.

Activity 3:
Full Cost Accounting

Purpose: To examine the concept of full cost accounting by selecting and analyzing the "costs" of a given product using the following organizer.

Background: Full cost accounting (FCA) generally refers to the process of collecting and presenting information about environmental, social and economic costs and benefits/advantages. It requires that consideration be given to hidden costs or externalities, to past and future outlays, and to costs related to the life cycle of a product.

Procedure:

- Have students select a product they consume and analyze and record the environmental costs at each stage in the life of the product using the table below.

Resources:

E-waste video clips from a *60 Minutes* special at:
news.cnet.com/8301-11128_3-10092317-54.html?tag=cntv
Full Cost Accounting: classof1.com/homework_answers/cost_accounting/full_cost_accounting/
Swiss Pack's Move to Full Cost Accounting: youtube.com/watch?v=nFm3jiZImGo
The Fundamentals of Full Cost Accounting: p2pays.org/ref/04/03315.pdf

NAME OF PRODUCT	ENVIRONMENTAL COSTS
Expected life span of product	
Raw materials required	
Processing of	
Transportation of	
Disposal of	

Activity 4:

Effects of Trade Globalization

"By the late 1970s, it was clear to me that we needed a different perspective on the problems."
–David Suzuki

Purpose: To have students consider some of the effects of trade globalization on agriculture and the garment industry.

Background: Dr. Suzuki draws attention to the links between our ever-expanding consumer demand, the global economy and the exploitation of the planet's raw materials. Trade globalization has both its critics and its defenders. The following exercise is intended to start discussion on trade globalization and its consequences by an examination of selected case studies focusing on cash crops. Cash crops such as bananas, sugar, coffee, tea and tobacco are crops that are usually grown in the developing world for export. The export of cash crops brings valuable foreign exchange to the producing country, but sometimes at considerable cost to the people and environment of the producing country. The subsidization of agricultural goods also works to the benefit of some and the disadvantage of others.

Critics of the global garment industry have also pointed to practices that result in an unequal sharing of the wealth generated by the production and sale of clothing.

The Victoria International Development Education Association (VIDEA) has developed case studies that allow us to examine where the money goes in the coffee trade ("Money in the Pocket") and the impact of subsidies in the trade of agricultural products ("Food and a Table"). Another case study, "Who's Running the Show?," allows us to examine practices in the garment industry.

(A) Procedure:

- Read Case Study 1 – Coffee, from "Money in the Pocket" <videa.ca/global/money/case1.html> and discuss the following:

  - The trend in coffee consumption and the growth of "coffee houses";
  - The source of the coffee being produced for consumption;
  - The price paid by coffee drinkers and the price paid to coffee producers;
  - The reasons for price fluctuations and the impact of falling prices on coffee growers and farmers;
  - Fair Trade and its implications for producers and consumers.

Additional Sources:

The Cocoa Trading Game: judesfairtrade.ca/files/cocoa_game_manual.pdf
The Coffee Chain Game – A simulation developed by Oxfam:
oxfam.org.uk/education/resources/coffee_chain_game
Just Us – A Fair Trade Co-operative: justuscoffee.com
New Internationalist Coffee Facts: newint.org/features/1995/09/05/facts
Pa Pa Paa – Teach About Fair Trade and Cocoa: papapaa.org/index.htm
Oxfam – World Food Crisis: oxfam.org.uk/education/resources/world_food_crisis/?284
Oxfam – Go Bananas: oxfam.org.uk/education/resources/go_bananas/?30

- Read Case Study 2 – The Effect of Agricultural Subsidies from "Food and a Table" <videa.ca/global/food/case2.html> and discuss the following:

  - The meaning and purpose of agricultural subsidies;
  - The impact of United States rice subsidies for American farmers and Haitian farmers;
  - Individual actions and trade policies that might improve the lives of farmers in the developing world.

Additional Sources:

Farming Solutions: farmingsolutions.org
Rice: globaleducation.edna.edu.au/globaled/go/pid/833
"Inexhaustible Appetites: Testing the Limits of Agroecosystems":
earthtrends.wri.org/features/view_feature.php?fid=23&theme=8

(B) Procedure:

- Read Case Study 1 – Consumerism, from "Who's Running the Show?" <videa.ca/global/trade/case1.html> and discuss the following:

  - The labels on the clothing worn by students and where the garments are made;
  - The role of advertising in marketing goods;
  - The impact of advertising on North American consumers;
  - Working conditions of those people in the developing world who sew the clothes we wear;
  - Reasons why people in the developing world work in conditions described in the case study;
  - Actions that can be taken by individuals, companies and governments to address problems in the global garment industry.

Additional Sources:

Images of the garment industry: unpac.ca/economy/g_clothes
Globalization: Fair vs. Cool: globaleducation.edna.edu.au/globaled/go/pid/1807

3. Overpopulation, Technology and a Global Economy

"So our numbers and longevity alone mean that as the most numerous mammal on the planet, we now have a very heavy ecological footprint. It takes a lot of land, air and water to support us and keep us alive." –David Suzuki

Activity 1:

The Bluefin Tuna Auction

Purpose: This activity examines how the combination of overpopulation, technology and the global economy has resulted in what Dr. Suzuki calls an intergenerational crime.

Background: Bluefin tuna are the source of the highest grade of sushi and sashimi, known to aficionados as maguro and toro. The fish is also a prized element of Mediterranean cuisine. Japan is by far the world's largest consumer, with fleets from Spain, Italy and France largely supplying the market there. Some studies indicate that stocks of bluefin tuna have dropped by 75% and are facing possible collapse.

Procedure:

- Show the section of ***Force of Nature*** dealing with the Tokyo fish market and discuss the following:

- Why is bluefin tuna in greater demand than other tuna?
- How has the global demand for sushi and sashimi affected the market for tuna?
- How have the following technologies contributed to the decline of the tuna catch?

1. Long lining
2. Purse seining
3. Harpooning
4. Refrigeration
5. Inboard freezers
6. Spotter planes
7. Sonar equipment
8. Bluefin tuna ranching

- What role do bluefin tuna play in the ocean food chain? What would be the impact of their extinction?
- How might the fate of the bison and northern cod provide direction in our approach to the bluefin tuna? See <lsf-lst.ca/media/cod.en.pdf?phpMyAdmin=27c4ca48e56t67ceba5e>.
- What measures might be taken to save the bluefin tuna?

Resources

Scientific American: "The Bluefin Tuna in Peril": scientificamerican.com/article.cfm?id=bluefin-tuna-in-peril
WWF – Bluefin Tuna in Crisis: wwf.panda.org/what_we_do/footprint/smart_fishing/target_fisheries/bluefintuna
Voice of America, "Bluefin Tuna Endangered by Overfishing":
voanews.com/english/news/asia/Bluefin-Tuna-Endangered-by-Overfishing--111159869.html
National Geographic – The Ocean:
ocean.nationalgeographic.com/ocean/take-action/impact-of-seafood/#/marine-food-chain
National Geographic – Bluefin Tuna: animals.nationalgeographic.com/animals/fish/bluefin-tuna

Activity 2:

Ecological Footprint

Purpose: To examine our individual and collective ecological footprint as a dramatic illustration of the unequal demands we make on the planet and its resources and the limits of growth.

Background: This activity helps illustrate the combined effect of overpopulation, our powerful technology and the global economy.

Procedure:

Describe/define the term ecological footprint. Complete the following chart to compare the per capita ecological footprint of a number of selected countries. Once completed, create a series of bar graphs that provide a visible illustration of the comparisons.

NAME OF COUNTRY	POPULATION IN MILLIONS	ECOLOGICAL FOOTPRINT IN GLOBAL HECTARES/PERSON
Canada		
Germany		
Somalia		
United Arab Emirates		
South Korea		
United States		
China		
India		

Earth Day Network <myfootprint.org> provides an excellent, multilingual online ecological footprint calculator that allows you to calculate your footprint for the country you are in.

Extensions:

- Students can calculate their individual footprints and learn more about the impact of resource consumption on the planet.
- Students can compare their footprint with the average of their country and other countries. They can learn about the different ways that people live around the world, and how that translates into different land use impacts.
- Ecological footprint analysis can be used to calculate the ecological footprint of a community—homes, schools, or an entire town. Students can collect the data through surveys, interviews and library research. Students could also look at different practices and see what effect they have (e.g. recycling, changes in diet).
- Students can present the results of their footprint calculations to their community, and propose ways to lower the community's footprint. Source: Learning for a Sustainable Future.

4. Identifying Solutions

"We have to reflect on how we arrived at this moment, search for the root causes of the problems so that we can find ways to avoid danger and discover new solutions that are truly sustainable."
–David Suzuki

Activity 1:

Sustainable Development: A Framework for Analysis

Purpose: To introduce the concept of sustainable development.

Background: The term "sustainable development" was introduced by the World Commission on Environment and Development (WCED) in its 1987 report entitled "Our Common Future." The aim of the World Commission was to find practical ways of addressing the environmental and developmental problems of the world. The Commission defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The following activity is designed to have students recognize the interplay of economic, social and environmental forces in developing strategies that will guide sustainable development policies.

Procedure:

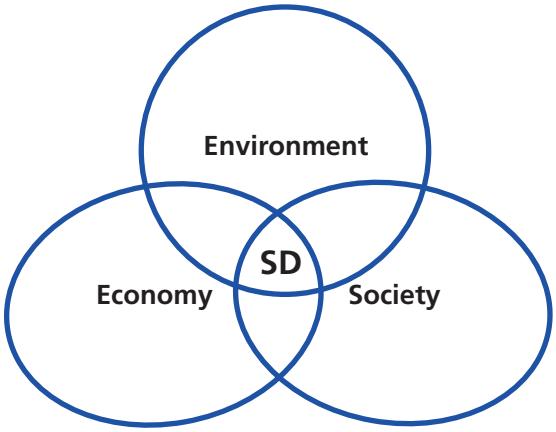
- Divide the class into three groups to research and report on:
  - The rapid growth of the world's population and its distribution (social);
  - The persistence of widespread poverty (economic);
  - The growing pressure placed on the Earth's resources (environmental).

- Each group is assigned a particular area of the classroom and following its research posts an outline of its central findings in bullet form.

A member is chosen from each group to serve as an ambassador who will approach the other two groups and discuss possible connections between their issue and that of the group visited. Other members of each group will stay "at home" to receive ambassadors. When a connection has been established between the respective groups, it is duly recorded.

Once the exchanges are completed, the class discusses the connections among the environmental, economic and social forces at play, develops a diagram to illustrate these links, and discusses what positive changes may be made in each category and the effect this would have in other categories.

Students discuss the purpose and merits of the following diagram in analyzing issues from a sustainable development perspective.



Resources:

"Sustainability within a Generation: A New Vision for Canada":
davidsuzuki.org/publications/downloads/2004/DSF-GG-En-Final.pdf

Activity 2:

Trade Globalization and Sustainable Development

Purpose: To enhance student understanding of trade globalization by noting and exploring the interplay among the economic, social and environmental forces involved.

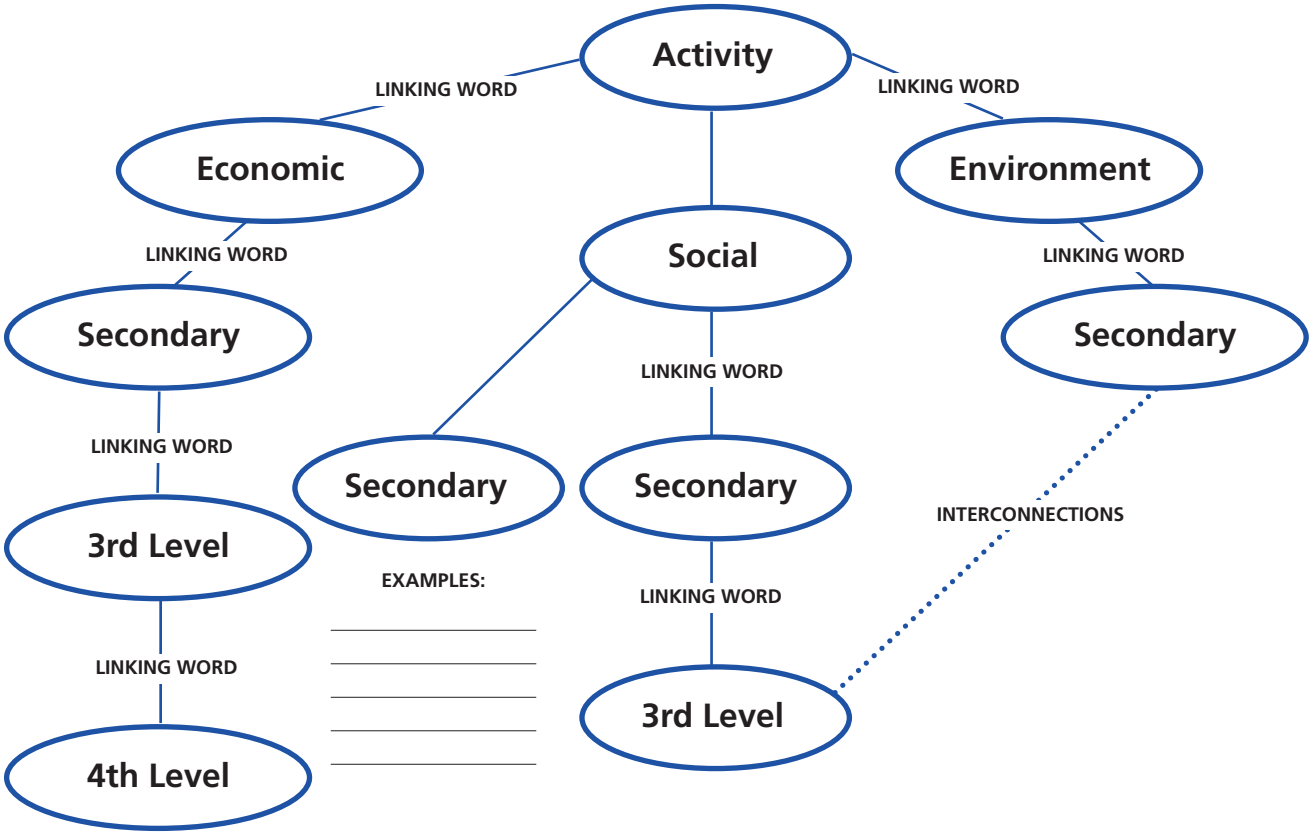
Background: There is growing recognition that a successful response to the challenges of the day requires that we understand the links among the forces at play in a given issue. Such an approach helps students develop the system thinking that is critical in meeting the challenges of a borderless world. The following chart and the accompanying activities are intended to help students become "system thinkers."

Procedure: Select one or more of the trade developments listed below, enter the selection in the activity section of the schematic provided and use the diagram to identify the economic, social and environmental consequences that may result from the selected trade development. Discuss the subsequent changes that may follow from these consequences by completing the remainder of the diagram.

Trade Developments:

1. Economic growth in China is creating a huge middle class.
2. Global competition has seen many industries move to countries where there is a cheap labour supply or where regulations are less restrictive.
3. Economic growth in emerging economies such as India and Brazil is increasing the global demand for fossil fuels.

Sustainable Development Lens



Activity 3:
Incentives/Disincentives

Purpose: If we are to reduce our individual and collective ecological footprint, consideration must be given to how we can change present behaviours.

Background: In this brainstorming activity, students identify incentives for promoting sustainable consumption of a variety of common products and materials based on their own purchasing behaviour.

Procedure:

- Complete the following table as a first step in identifying and initiating a discussion about measures that might be taken to promote sustainable consumption.*

PRODUCT/SERVICE	INCENTIVES TO PROMOTE SUSTAINABLE CONSUMPTION**	DISINCENTIVES TO PROMOTE SUSTAINABLE CONSUMPTION***	LEGISLATION TO PROMOTE SUSTAINABLE CONSUMPTION****	INDIVIDUAL ACTION TO PROMOTE SUSTAINABLE CONSUMPTION
Fast food				
Paper products				
Clothing				
Transportation				
Waste disposal				
Energy use				

*Sustainable consumption may be defined as " . . . the use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations."
Source: Norwegian Ministry of the Environment, "Oslo Roundtable on Sustainable Production and Consumption," 1994.

** "Rewards" to encourage appropriate consumption.
*** "Penalties" to discourage inappropriate consumption.
**** Laws and regulations to penalize inappropriate consumption.

Activity 4:

Gross Domestic Product (GDP) as a Measure of Well-being

Purpose: To have students explore the merits of GDP as a measure of a country's well-being.

Background: The yardstick traditionally used to measure a nation's "progress" has been the GDP—the Gross Domestic Product, or the value of all the goods and services produced by a country in a given year. There are, however, those who are beginning to question the merits of using the GDP as a gauge and are suggesting alternatives.

Procedure:

- Indicate how each of the following developments might lead to an increase in GDP:

DEVELOPMENT	IMPACT ON ENVIRONMENT AND SOCIETY	IMPACT ON GDP
Exxon Valdez spills great quantities of oil in the coastal waters off Alaska		
Cigarette sales increase		
Heightened tensions in the Middle East		
Increased demand for energy leads to greater exploration for and development of fossil fuels		

Activity 5:

Alternatives to GDP

Purpose: To examine a number of alternatives that have been suggested as a better way of measuring a country's well-being. Among these is the Human Development Index.

Procedure:

- Have students work in pairs to devise a set of criteria/indicators that serves as a better measurement of a nation's well-being. Students then negotiate a set of criteria that represents the class's thinking.

Activity 6:

Roundtable on Population and Consumption

Purpose: In discussing what might be done to meet the challenges outlined by Dr. Suzuki, it is necessary to identify the various perspectives at play. Role-playing in the following roundtable simulation can be helpful in this regard.

Background: Discussions on the issues of population growth and consumption often reveal competing perspectives on the issues. Those in the developed world tend to focus on the fertility rate in the developing world, while the developing world is inclined to point to the consumption rate of the developed world and the difference in the ecological footprints of the two.

Procedure:

- The following individuals are engaged in a roundtable discussion on the challenges created by the increasing world population and the impact of increased consumption on the carrying capacity of the Earth:
  - Representative of an NGO promoting the adoption in the developing world of maternal measures intended to reduce mortality among pregnant women and their unborn children;
  - Representative of a religious organization opposed to the use of foreign aid to promote birth control and abortion to reduce population growth in the developing world;
  - Representative of a government in the developing world who believes that the critical challenge is the unequal consumption of the world's resources;
  - Representative of World Bank who believes that an increased standard of living is most likely to reduce population growth in the developing world;
  - Representative of a government in the developed world who believes the country should adopt family-friendly policies (baby bonus/child benefits, childcare, parental leave/annual vacation/other benefits) designed to increase the fertility rate in order to respond to challenges faced by aging population.

- Arrange a roundtable in the classroom in which students are assigned the above roles and others serve as their advisors. (See Appendix – Instructions for Roundtable.)

Profiles:

Representative of NGO

The birth rate in the developing world is high in part because the infant mortality rate is high (the parents' expectation that some of their children will die results in a greater number of children per family.) Therefore in order to lower the fertility or birth rate we must lower infant mortality rates. This means attention to prenatal and postnatal care. Prenatal care is intended to provide the required education and to identify those complications that may threaten the well-being of the mother and child. Postnatal care means that the mother and child receive help with respect to nutrition, breastfeeding and family planning. Both pre- and postnatal care will be most effective where provisions are made for midwives to assist.

Many of our efforts at population control represent an attack on women's reproductive rights. Our position is that reproductive rights represent a subset of human rights. Women have been sidelined in the debate over population control, and only when we allow women to control their own fertility will we get it right.

Representative of religious organization
Efforts at population control have often involved forced abortion and sterilization. One has only to look at the sterilization policy in India in the mid-1980s and China's current one-child policy. Our concern is with the morality of the current consumption of raw materials at a rate that compromises future generations.

When the status of women has been raised through education and better health, the birth rate declines. The work of church agencies in the developing world in education and health is in keeping with this reality.

Part of the answer is to be found in sex education—but such education must include due attention to abstinence.

Representative of government in the developing world
The pressures placed on the Earth to provide for our needs are not due to population growth in the developing world but to consumption in the developed world. We live in a 20/80 world in which 20 percent of the population (people in the developed world) consumes 80 percent of the world's resources. Wants trump needs. One has only to look at the respective ecological footprints of people in the developed and developing world. Talk about population control only serves to divert attention from the real issue, which is social justice—the need to address the great inequities in the world.

Representative of World Bank
Studies show a strong correlation between female literacy and a decline in fertility. Our focus therefore should be on education for girls. Other studies suggest that the best birth control method is increased prosperity. As the economic situation of women and their families improves, the number of children born into those families declines. Accordingly, we should support efforts to raise the living standards of people in the developing world.

Representative of government in the developed world
Our problems are not caused by increased fertility but by declining birth rates, resulting in an aging population. It is the fertility rates in the developing world that must be addressed. The current growth rates not only threaten the carrying capacity of the planet but serve to undermine efforts at improving the lives of people in the countries of the developing world as well as the environment of these countries. Poverty is as hard on the environment as prosperity.

Resources:

United Nations' Population, Challenges and Development Goals:
un.org/esa/population/publications/pop_challenges/Population_Challenges.pdf
"Sustainability within a Generation: A New Vision for Canada":
davidsuzuki.org/publications/downloads/2004/DSF-GG-En-Final.pdf

5. Taking Action

"The crisis is real and it is upon us. The Chinese symbol for crisis is made up of two parts danger and opportunity. The opportunity comes from recognizing that we cannot continue along the same path that got us here." –David Suzuki

Activity 1:

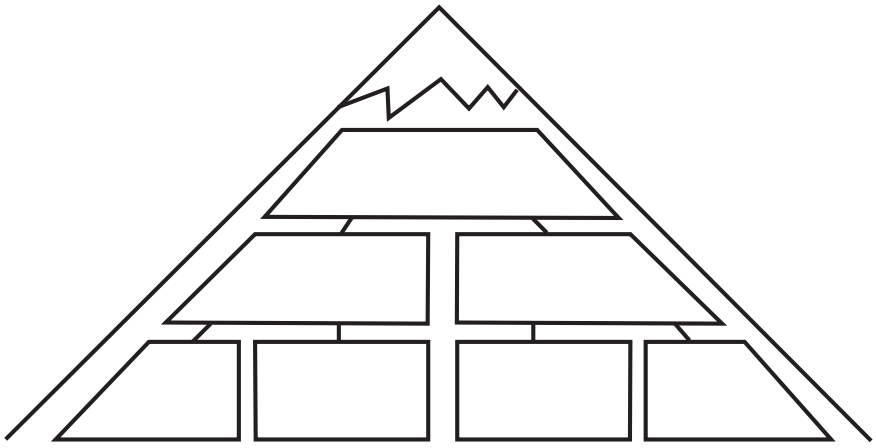
Goal Mountain

Purpose: Students identify global, local and individual actions to meet the challenges created by unlimited demands on finite resources.

Background: Increasingly, curriculum documents are suggesting that there be an action component to the units studied therein. In considering possible responses to the issues raised in this section, students should outline a plan that distinguishes between goals, strategies, and tactics. Their recommendations must be in accordance with the principles of sustainable development, and the planning exercise requires that the specific steps and strategies needed to achieve each goal be included.

Procedure:

- Use the organizer below to identify and outline steps or strategies that may be undertaken to meet the challenges created by making unlimited demands on finite resources. The peak of the mountain represents the ultimate goal, which is to check population growth; immediately below is the general strategy for realizing that goal; the blocks below are intended to identify the specific steps that must be taken to carry out the general strategy.



Activity 2:

Support an Organization of Your Choice

Purpose: To evaluate and consider support for an organization or organizations promoting sustainable development.

Background: While individual actions on behalf of the planet and its inhabitants are to be applauded, it is sometimes helpful to consider collective action within the context of a relevant organization. This may allow one to better understand the causes and consequences of particular harmful policies and actions and provide direction on what may be done in response.

Procedure:

- Establish criteria that might be used to evaluate organizations with a mandate to promote a stewardship ethic towards the planet and its people. Once the criteria are in place, apply them to evaluate various organizations devoted to living sustainably and select one that you might support. Indicate an action you will take that is both achievable and effective.

Resources:

PlanetFriendly.net: planetfriendly.net/living.html
David Suzuki Foundation: davidsuzuki.org/#
Joy to the Planet: joytotheplanet.com
Fair Trade Foundation: fairtrade.org.uk/get_involved/default.aspx
Greenpeace: greenpeace.org/canada/en
The Otesha Project: otesha.ca
Local community organizations

Activity 3:
Bottled Water

Purpose: To examine the reasons for the popularity of bottled water; the consumption pattern; the effect of bottled water on the environment; and possible responses to the issue of bottled water.

Background: According to CBC News in Depth <cbc.ca/news/background/consumers/bottled-water.html>, between 2002 and 2007 world consumption of bottled water jumped by 7.6 per cent per year, from 130.95 billion litres to 188.8 billion litres. In Canada, bottled water consumption was estimated at 24.4 litres per person in 1999. By 2005, that had increased to about 60 litres per person, with sales worth $652.7 million.

The global rate of consumption more than quadrupled between 1990 and 2005. Spring water and purified tap water are currently the leading global sellers. By one estimate, approximately 50 billion bottles of water are consumed per annum in the US, and around 200 billion bottles globally.

Procedure:

- Research the bottled water industry (some Internet sources are listed below) and record your findings relating to…
  - The power of advertising
  - Health considerations
  - Taste considerations
  - Environmental considerations
  - Outline possible responses/actions that may be taken by individuals, municipalities, and provincial and federal governments to the bottled water debate.
  - Develop a PowerPoint presentation, a video, an editorial in the school newspaper, a letter to the editor of the local paper or a poster to draw attention to the issue.
  - Report on the goals of World Water Day (March 22, 2011) and the actions suggested by its supporters.

Resources

CBC: "Quenching a Planet's Thirst": cbc.ca/news/background/consumers/bottled-water.html
"Buying Bottled Water Is Wrong, Says Suzuki":
cbc.ca/news/canada/newfoundland-labrador/story/2007/02/01/suzuki-water.html
Images of bottled water: inhabitat.com/australian-town-bans-bottled-water
The Story of Bottled Water: youtube.com/watch?v=Se12y9hSOM0
Bottled Water vs. Tap Water on *20/20* with John Stossel: youtube.com/watch?v=_3QBZac3MSY
CBS News: cbsnews.com/video/watch/?id=6421294n
NFB film: *Crapshoot: The Gamble with Our Wastes:*
nfb.ca/playlists/films-change/viewing/crapshoot_the_gamble_with_our_wastes

Other Action Suggestions:

- Create a Wall of Fame in your classroom in which you identify those individuals or organizations that have done exemplary work in promoting sustainable development or living sustainably.
- Create a Pledge Wall in your classroom where students can record their actions on behalf of the planet and its people.
- Examine the concept of fair trade and the case made by its supporters. Develop an educational plan for your school or community that will promote principles of fair trade.

Appendix

Curriculum Matrix

PROVINCE	SUBJECT	RELEVANT COURSES	CURRICULUM UNITS
Alberta	Science	Science 14, Grade 10	Integrating Matter & Energy in the Environment
Alberta	Science	Science 30, Grade 12	Energy & the Environment
Alberta	Social Studies	Social Studies 10-1, Perspectives on Globalization; Social Studies 10-2, Living in a Globalizing World	Response to Globalization; Globalization & Sustainable Prosperity
Alberta	Social Studies	Social Studies 30, Grade 12	Contemporary Global Interactions
Alberta	Environmental Education	Environmental & Outdoor Education	Environmental Core; Commitment to Action
Alberta	Science	Science 20, Grade 11	Changes in Living Systems
Alberta	Science	Biology 20, grade 11	Ecosystems & Population Change; Energy & Matter Exchange in the Biosphere
Alberta	Science	Biology 30, Grade 12	Population & Community Dynamics
Alberta	Social Sciences	World Geography 30, Grade 12	World Patterns of Population & Settlement; World Patterns of Humankind's Use of the Earth; World Patterns of Physical Elements
British Columbia	Social Studies	Social Studies 11	Human Geography
British Columbia	Science	Biology 11	Ecology
British Columbia	Geography	Geography 12	Weather & Climate; Biomes, Resources & Sustainability
British Columbia	Civics	Civic Studies 11	Civic Action
British Columbia	Science & Technology	Science & Technology 11	Science Module, Technology Module
British Columbia	Science	Science 10	Sustainability of Ecosystems
British Columbia	Sustainable Resources	Sustainable Resources 11 & 12	Agriculture, Fisheries, Forestry, Mining
Manitoba	Science	Senior 2 Science, Grade 10	Dynamics of Ecosystems
Manitoba	Science	Biology 12	Biodiversity
Manitoba	Social Studies	Canada in the Contemporary World, Grade 9	Canada in the Global Context
Manitoba	Social Studies	Geographic Issues in the 20th Century, Grade 10; World Geography, A Human Perspective, Grade 12	Natural Resources; Food from the Land; World Population; World Food Supply; World Resources; World Interdependence

PROVINCE	SUBJECT	RELEVANT COURSES	CURRICULUM UNITS
Manitoba	English Language Arts	English Language Arts, Grades 9–12	Comprehends and responds personally & critically to oral, print and other media
Manitoba	Social Studies	World Issues, Grade 12	Quality of Life Perceptions; The World of the Future
New Brunswick	Science	Biology 11	Biodiversity
New Brunswick	Science	Environmental Science 12	Introduction; Sustainable Development; Pollution; Resources
New Brunswick	Science	Science 10	Sustainability of Ecosystems
New Brunswick	Social Studies	Canadian Geography 12	Managing Natural Resources; Continental & Global Linkages
New Brunswick	Social Sciences	Canadian History 12	Canada & the Global Community
New Brunswick	Social Studies	World Issues 12	Issues Facing the Global Community; The Future of the Global Community
New Brunswick	Social Studies	Atlantic Canada in the Global Community	Economics; Technology; Interdependence
New Brunswick	English-Language Arts	English Language Arts	Reading & Viewing
Newfoundland and Labrador	Economic Education	Canadian Economy 2203	Global Economic Concepts; Economic Issues
Newfoundland and Labrador	English-Language Arts	English Language Arts, Grades 10–12	Reading & Viewing
Newfoundland and Labrador	Science	Biology 2201	Biodiversity; Interaction Among Living Things
Newfoundland and Labrador	Social Studies	Canadian Geography 1202	The Natural Environment; Natural Resources; The New Economy; Connections
Newfoundland and Labrador	Social Studies	World Geography 3200/3202	Land & Water Forms; World Climate Patterns; Ecosystems; Population Distribution & Growth
Newfoundland and Labrador	Social Studies	Atlantic Canada in the Global Community, Grade 9	Interdependence
Northwest Territories	Science	Science 14, Grade 10	Integrating Matter & Energy in the Environment
Northwest Territories	Science	Science 20, Grade 11	Changes in Living Systems
Northwest Territories	Science	Science 30, Grade 12	Energy & the Environment
Northwest Territories	Science	Biology 20, grade 11	Ecosystems & Population Change; Energy & Matter Exchange in the Biosphere

PROVINCE	SUBJECT	RELEVANT COURSES	CURRICULUM UNITS
Northwest Territories	Science	Biology 30, Grade 12	Population & Community Dynamics
Northwest Territories	Social Sciences	World Geography 30, Grade 12	World Patterns of Population & Settlement; World Patterns of Humankind's Use of the Earth; World Patterns of Physical Elements
Northwest Territories	Social Studies	Social Studies 10-1, Perspectives on Globalization; Social Studies 10-2, Living in a Globalizing World	Response to Globalization; Globalization & Sustainable Prosperity
Northwest Territories	Social Studies	Social Studies 30, Grade 12	Contemporary Global Interactions
Northwest Territories	Environmental Education	Environmental & Outdoor Education	Environmental Core; Commitment to Action
Nova Scotia	Science	Biology 11	Biodiversity; Interactions Among Living Things
Nova Scotia	Science	Science 10	Sustainability of Ecosystems
Nova Scotia	Social Studies	Atlantic Canada in the Global Community	Economics; Technology; Interdependence
Nova Scotia	Social Sciences	Global History 12	North-South: Origins & Consequences of Economic Disparity; Societal & Technological Change; Acknowledging Global Interdependence
Nova Scotia	Social Sciences	Canadian Economy	Global Economic Concepts; Economic Issues
Nova Scotia	Technology Education	Exploring Technology, Grade 10	Consequences of Technology
Nova Scotia	Social Sciences	Global Geography 1	Our Fragile Planet; Perilous Processes; The Peopled Planet; Feeding the Planet; Global Resources; Global Factory; The Future Planet
Nunavut	Science	Science & Technology, Grade 10	Understanding Our Environment
Nunavut	Science	Science 20, Grade 11	Changes in Living Systems
Nunavut	Science	Science & Technology, Grade 11	Understanding Our Environment
Nunavut	Science	Science 30, Grade 12	Energy in the Environment; Population & Human Dynamics
Nunavut	Science	Biology 30, Grade 12	Population & Community Dynamics
Nunavut	Social Studies	Social Studies 10-1, Perspectives on Globalization; Social Studies 10-2, Living in a Globalizing World	Response to Globalization; Globalization & Sustainable Prosperity
Nunavut	Social Studies	Social Studies 30, Grade 12	Contemporary Global Interactions
Ontario	Economics	The Individual & the Economy, Grade 11; Making Economic Choices, Grade 11; Analyzing Current Economic Issues, Grade 12	Economic Decision-Making;Economic Stakeholders;Self-Interest and Interdependence

PROVINCE	SUBJECT	RELEVANT COURSES	CURRICULUM UNITS
Ontario	Geography	The Americas; Geographic Patterns & Issues, Grade 11; Physical Geography: Patterns, Processes & Interactions, Grade 11; The Geographer's Toolkit, Grade 11; Canadian & World Issues: A Geographic Analysis, Grade 12; World Geography, Human Patterns & Interactions, Grade 12; The Environment & Resource Management, Grade 12; Geotechnologies in Action, Grade 12; Geography of Canada, Grade 9	Human – Environment Interactions; Understanding & Managing Change; Global Connections
Ontario	Civics	Civics, Grade 10	Informed Citizenship; Purposeful Citizenship; Active Citizenship
Ontario	Political Science	Canada & World Politics, Grade 12	Participation in the International Community
Ontario	Science	Environmental Science, Grades 11 & 12	Sustainable Agriculture & Forestry; Reducing & Managing Waste; Conservation of Energy
Ontario	Science	Science, Grades 9 & 10	Biology: Sustainable Ecosystems & Human Activity; Earth & Space Science: Climate Change
Ontario	English	English, Grades 9–12	Media Studies
Ontario	History	Canadian History & Politics Since 1945, Grade 11	Communities: Local, National & Global
Ontario	Science	Biology, Grade 12	Population Dynamics
Ontario	Arts	Media Arts, Grades 9–12; Visual Arts, Grades 9–12	Creating & Presenting; Reflecting, Responding & Analyzing
Ontario	Arts	Media Arts, Grades 9–12; Visual Arts, Grades 9–12	Creating & Presenting; Reflecting, Responding & Analyzing
Prince Edward Island	Science	Agriscience 810A	All outcomes
Prince Edward Island	Social Studies	Geography 621A	What Is a Global Issue?; What Are the Issues?; What Can I Do about It?
Prince Edward Island	English Language Arts	English Language Arts, Grades 10–12	Reading & Viewing
Prince Edward Island	Social Studies	Economics 621A	Issues in the Canadian Economy
Quebec	Personal Development	Physical Education & Health	Adopts a healthy, active lifestyle
Quebec	Social Sciences	Geography, History & Citizenship Education	Constructs his/her consciousness of global citizenship
Quebec	Mathematics, Science & Technology	Mathematics, Science & Technology	Makes the most of his/her knowledge of science and technology, seeks answers or solutions to scientific or technological problems, communicates by using the language of science & technology

PROVINCE	SUBJECT	RELEVANT COURSES	CURRICULUM UNITS
Quebec	Cross-Curricular Competencies	Competencies 2, 3, & 4	Solves problems, exercises critical judgment, uses creativity
Saskatchewan	Social Studies	Social Studies 30, Grade 12	Globalization
Saskatchewan	History	History 20, Grade 11	Global Issues
Saskatchewan	Science	Science 10, Grade10	Sustainability of Ecosystems
Saskatchewan	Science	Biology 20, Grade 11	Ecological Organization,
Saskatchewan	English Language Arts	English Language Arts B10, Grade 10	Environment & Technology
Saskatchewan	Social Studies	Social Studies 20, Grade 11	Population, Environment, Wealth & Poverty
Yukon	Science	Biology 11	Ecology
Yukon	Geography	Geography 12	Weather & Climate, Biomes, Resources & Sustainability
Yukon	Civics	Civic Studies 11	Civic Action
Yukon	Science & Technology	Science & Technology 11	Science Module, Technology Module
Yukon	Science	Science 10	Sustainability of Ecosystems
Yukon	Social Studies	Social Studies 11	Human Geography

TEACHER'S GUIDE CREDITS

National Film Board of Canada (NFB)
Tey Cottingham, Head, Institutional and Educational Markets
Kathy Sperberg, Manager, National Education Programs
Sophie Quevillon, Coordinator, Education Material

Co-authors
Jim Petrie
Chris Porter

Educational Consultant, *Towards a New Perspective* Teacher's Guide
Dolores van der Wey, PhD

Editors
George Kaltsounakis (NFB)
Christopher Korchin

Graphic Design
Pierre Durand

Photos
Ari Gunnarsson
Additional photos courtesy of Sturla Gunnarsson