



CGD3M

THE AMERICAS: GEOGRAPHIC PATTERNS AND ISSUES, GRADE 11, UNIVERSITY/COLLEGE PREPARATION

Overview

Students analyse the impact of climate change on various countries within the Americas from physical, economic and cultural perspectives. Comparisons of sources and quantities of greenhouse gas emissions by country lead to suggestions for future actions to address climate change.



SYSTEMS THINKING

The world is a network of natural and human systems in constant interaction.

How does climate change have an impact on the natural and human systems within the environments of the Americas?

Curriculum Expectations

Please see page 15 for a list of the course curriculum expectations that can be linked to the Guiding Questions below.

GUIDING QUESTIONS

QUESTIONS	LEARNING CONCEPTS
<p><i>How do different nations and regions contribute to CO₂ production?</i></p>	<p>Economic forces (trade of resources or cash crops) can affect state decisions that have global consequences. Deforestation for harvesting timber or to produce more arable land for cash crops means that carbon sequestered in the forest is released into the atmosphere.</p> <p>Using marginal land for agriculture requires massive use of fertilizers and pesticides produced through industrial processes that also contribute to GHG emissions. Such unsustainable practices reduce the long-term yield and can lead to desertification and problems with sources of potable water.</p> <p>Use data to rank nations in terms of CO₂ production, national wealth and consumption of resources (e.g., wood, oil, coffee). This data can then be compared to economic and environmental disparity that contributes to demographic changes including increasing urbanization and the erosion of indigenous cultures (and perhaps sustainable practices).</p>

QUESTIONS	LEARNING CONCEPTS
<i>How are these nations and regions differently affected by the impact of climate change?</i>	The consequences of climate change affect all people, but the poorer nations are often the most vulnerable to devastating climatic variations. This is seen when considering the impact of severe weather events, such as hurricanes, which can wipe out an annual crop and kill many people.
<i>Who is responsible for making decisions about the reduction of GHGs? What are the kinds of decisions that can be made by specific nations or regions?</i>	Individuals, multinational corporations and governments can participate in international efforts to manage economic and environmental concerns. The Kyoto Protocol is such an effort. Different strategies are used to find energy sources that do not contribute further to climate change. Sharing energy-efficient technologies can help developing nations as they adapt to the constraints of agreements such as Kyoto. Different countries will have different solutions: some technologies will be more appropriate for one country than another (e.g. wind vs. solar energy).

CASE STUDY

HAITI AND A CHANGING CLIMATE

Ongoing human interaction with the environment may lead to significant environmental changes that then affect our ability to sustain the population. This can lead to human adaptation, new interactions and further unforeseen environmental changes. For example, the deforestation of Haiti has resulted in desertification, soil loss, diminished food production and the loss of potential tourist activity. Haiti has little ability to sustain its population or withstand the destructive force of hurricanes. On a larger scale, such environmental changes contribute to global climate change that has an impact on us all, limiting our ability to aid others.

The role of CO₂ gas is central in understanding climate change. An increase in CO₂ and other heat-trapping gases changes the composition of the atmosphere and affects the flow of energy out of the planet into space: more energy is retained and transferred into wind and water

movement that affects wind and ocean current patterns. Identifying CO₂ sources and the global nature of this issue helps people to understand the need for international approaches that limit production and may help slow the rate of climate change on the planet.

Severe weather has always existed, but there are now more severe weather events which can affect countries like Haiti. Severe weather patterns will affect different areas of the Earth in different ways. These changes in frequency and severity may be linked to increased energy and changing levels of CO₂ in the atmosphere. With improved satellite technology, temperature data can be collected (e.g. atmospheric and oceanic data) and trends can be tracked allowing for forewarning of conditions such as El Niño, La Niña or hurricane formation. The relationship between severe weather events and climate change is a complex one: see Appendix 1 on page 42 for more information.

Teaching Suggestions

- **Using Guiding Questions:** The Guiding questions (listed on p. 7) can be used in a number of ways. One suggestion is to use them to model and develop inquiry skills. As a class examine the guiding questions and gather information on Canada. Illustrate the use of various representation forms (charts, graphs, maps) to present different kinds of data, including temperature, CO₂ sources, forested areas and population levels. See the resource section for this course for a list of supporting resources and atlases.
- **Apply learning to other countries:** once a basic understanding is established, students can then apply the approach on other countries within the Americas.
- **Expert Focus Groups:** First, examine the questions from your local perspective to model for the class the critical thinking needed to respond to the guiding questions.

Follow up by organizing students into small groups (3 to 5 students) responsible for ongoing research for a nation or region of nations. These expert focus groups can then revisit the same geographic place from many different perspectives, including physical geography, historical development, demographic patterns, climate, agricultural output and changing use of resources. Have students include CO₂ in their survey of the nation or region, both its sources and the areas that sequester and store carbon, as well as sites of severe weather events and environmental degradation. This environmental perspective can provide students with an opportunity to consider climate change issues within the larger context of natural geographic systems and interacting social systems.

RESOURCES

LOCAL AND REGIONAL CONSEQUENCES OF GLOBAL WARMING

Global Warming: Early Warning Signs – annotated world map. 4 Activities:

- *Climate Change in my City*
- *Oral History*
- *Climate Change and Disease*
- *Climate Change and Ecosystems*

www.climatehotmap.org

DIOXIDE EMISSIONS

Climate and atmosphere – includes data identifying carbon emissions by source for individual countries

<http://earthtrends.wri.org>

CLIMATE CHANGE ISSUES AND POTENTIAL SOLUTIONS

An overview of climate change issues and solutions, with fact sheets on alternatives to fossil fuels.

www.panda.org/about_wwf/what_we_do/climate_change/index.cfm

EL NIÑO AND LA NIÑA

Temperature changes in the Pacific Ocean related to El Niño and La Niña events

www.jpl.nasa.gov/earth/ocean_motion/el_nino_index.cfm

CURRICULUM EXPECTATIONS

STRAND/OVERALL EXPECTATIONS	SPECIFIC EXPECTATIONS
<p>Geographic Foundations: Space and Systems</p> <ul style="list-style-type: none"> • compare the diverse human systems and cultural realms of the Americas • analyse the political, economic, and social factors that contribute to disparities in economic development within the Americas 	<p><i>Building Knowledge and Understanding</i></p> <ul style="list-style-type: none"> • describe the patterns of natural characteristics in the Americas • describe the cultural realms and other major human patterns of the Americas • explain the relationships among patterns of settlement, resource distribution, development, and migration in selected regions of the Americas • describe trade patterns within and between selected economic regions of the Americas and analyse the factors that have shaped them <p><i>Developing and Practising Skills</i></p> <ul style="list-style-type: none"> • analyse the factors affecting the economic development of different regions in the Americas • compare the standards of living of various groups selected countries or regions of the Americas <p><i>Learning Through Application</i></p> <ul style="list-style-type: none"> • analyse economic and quality-of-life data to identify patterns of socio-economic inequality within the Americas • analyse development patterns in selected regions of the Americas and identify the benefits and disadvantages of development for each region chosen
<p>Human-Environment Interactions</p> <ul style="list-style-type: none"> • analyse the causes and effects of human-environment interactions in various ecological zones of the Americas • evaluate the environmental and economic consequences for the Americas of natural hazards and climatic variations • analyse the linkages between population shifts and changes in physical and human environments in the Americas 	<p><i>Building Knowledge and Understanding</i></p> <ul style="list-style-type: none"> • describe the causes and effects of environmental degradation in specific areas of the Americas • analyse the regional distribution of different types of natural disasters and climatic variations that affect the Americas and describe their consequences • analyse the effects of rural-to-urban population shifts on mega-cities of the Americas <p><i>Developing and Practising Skills</i></p> <ul style="list-style-type: none"> • analyse the short-term and long-term social, environmental, and economic effects of natural hazards on selected regions in the Americas • compare the ways in which selected groups of indigenous peoples in the Americas have responded to the challenges and opportunities of their environments • analyse how human migrations have affected selected natural and human environments in the Americas • predict the direction of future economic development in the Americas and its impact on the environment <p><i>Learning Through Application</i></p> <ul style="list-style-type: none"> • conduct a geographic inquiry that demonstrates how various regions in the Americas are affected by and deal with water scarcity • describe the long-term local and global effects of the destruction of major forest regions in the Americas • analyse how the production and transportation to market of selected resources affect natural ecosystems and human societies in the Americas

STRAND/OVERALL EXPECTATIONS	SPECIFIC EXPECTATIONS
<p>Global Connections</p> <ul style="list-style-type: none"> • evaluate the impact of the global economy on the environment and peoples of the Americas • analyse how the nations of the Americas interact to promote or defend their political, economic, environmental, and social interests 	<p><i>Building Knowledge and Understanding</i></p> <ul style="list-style-type: none"> • describe how disparities between rich and poor nations in the Americas affect interactions between them • describe various ways in which individuals, multinational corporations, and governments participate in the international relations of the countries of the Americas • describe Canada’s responsibilities to the rest of the countries of the Americas • explain how their geographic advantages and disadvantages affect the economic development of the nations of the Americas <p><i>Developing and Practising Skills</i></p> <ul style="list-style-type: none"> • evaluate the effects on Central and South America of world demand for the regions’ products and resources • explain the economic, social, and environmental impact of the global economy on the people and environments of selected countries in the Americas, including Canada • analyse economic data to determine the global ranking, as producers and users of resources, of the Americas as a group and of individual nations of the Americas <p><i>Learning Through Application</i></p> <ul style="list-style-type: none"> • analyse selected examples of relationships that have developed between regions in the Americas because of environmental problems, resource needs, and border conflicts
<p>Understanding and Managing Change</p> <ul style="list-style-type: none"> • evaluate the effects of various political, economic, social, and technological changes on physical and human environments in the Americas • evaluate various aid programs in the Americas and their impact 	<p><i>Building Knowledge and Understanding</i></p> <ul style="list-style-type: none"> • describe how population distribution in the Americas has changed over the past one hundred years as a result of changes in population growth, the economy, and technology <p><i>Learning Through Application</i></p> <ul style="list-style-type: none"> • compare the problems of living in a large city in North America to those of living in one in South America • analyse a development project in the Americas to determine its effect on local environments and economies, including those of indigenous peoples

STRAND/OVERALL EXPECTATIONS	SPECIFIC EXPECTATIONS
<p><i>Methods of Geographic Inquiry and Communication</i></p> <ul style="list-style-type: none"> • <i>use the methods and tools of geographic inquiry to locate, gather, evaluate, and organize information</i> • <i>analyse and interpret data gathered through research and investigation, using a variety of methods and geotechnologies</i> • <i>communicate the results of geographic inquiries, using appropriate terms and concepts and a variety of forms and techniques</i> 	<p><i>Research</i></p> <ul style="list-style-type: none"> • develop and use appropriate questions to focus a geographic inquiry • gather geographic information from primary sources and secondary sources to research a geographic topic or issue • gather geographic information, using a variety of geographic tools and technologies • evaluate the credibility of sources and the reliability and usefulness of information <p><i>Interpretation and Analysis</i></p> <ul style="list-style-type: none"> • distinguish among opinion, argument, and fact in research sources • use a variety of geotechnologies to interpret, analyse, and synthesize information in connection with a geographic inquiry • use graphic organizers to clarify and interpret geographic information • use different types of maps to identify and interpret geographic relationships • use appropriate statistical methods and categories of data in geographic analysis, observing accepted conventions • develop possible solutions to geographic problems or issues, using appropriate forecasting, decision-making, and/or problem solving strategies • explain the different points of view on a geographic issue that are, or might be, held by various stakeholders • produce a variety of maps, diagrams, and charts, following accepted conventions, to illustrate geographic patterns and relationships • provide appropriate and sufficient geographic evidence and well-reasoned arguments to support opinions and conclusions • complete an independent inquiry that deals with a topic or issue concerning the Americas and that reflects the required elements of a geographic inquiry <p><i>Communication</i></p> <ul style="list-style-type: none"> • communicate the results of geographic inquiries, for different audiences and purposes, using a variety of forms and including geographic visual supports, both conventional and geotechnological • use an accepted form of academic documentation to acknowledge all information sources, including electronic sources • use appropriate terminology when communicating results of geographic inquiries

This resource is an adaptation of the EcoSchools *Climate Change in Grade 11 and 12 Geography* produced by the Toronto District School Board (TDSB). The TDSB has donated this resource to the Ontario EcoSchools Program as part of its in-kind contribution to the project.



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