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# Global Environmental Problems, the ISA way

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# UNDERSTANDING BY DESIGN

## Unit Cover Page

Unit Title: Global Environmental Problems, the ISA way

Grade Level: 9th

Subject/Topic Area(s): Interdisciplinary—World Geography, Biology, English, Technology, Math  
(minimally)

Designed By: Mitzi Moore and Kathleen Pedder, based on The Choices Program (of Watson Institute for International Studies at Brown University) and utilizing curriculum resources of Population Connection

Time Frame: one month

School District: North East Independent School District

School: International School of the Americas

School Address and Phone: 1400 Jackson Keller Road, San Antonio, TX, 78213, 210-442-0404

### **Brief Summary of Unit** (Including curricular context and unit goals):

This unit asks freshmen to verbally advocate for an assigned policy option from an assigned roll, during a simulation in which they work in teams to influence a mock Presidential Advisory Panel on Environmental Issues. Learning the content (global environmental problems), researching, and collaborating to establish a position will take one month and be taught primarily through Biology and World Geography classes, with support from Math and Multimedia. They will also read Ishmael in English class, and extend their understanding of sustainability issues by taking a week-long field trip immediately following the simulation.

# Global Environmental Problems— an interdisciplinary project for the 9<sup>th</sup> grade

By Kathleen Pedder and Mitzi Moore, 2011

Stage 1 – Desired Results		
<p><b>Established Goals</b></p> <p><b>Science:</b>  <a href="#">Biology TEKS 12 C, D, E, F</a>            F. describe how environmental change can impact ecosystem stability.  <a href="#">ISA Science Literacy (all)</a>            Explains how an issue is part of a complex global system.</p> <p><b>Social Studies:</b>  <a href="#">World Geography TEKS 8</a>            B. compare ways that humans depend on, adapt to, and modify the physical environment using local, state, national, and international human activities in a variety of cultural and technological contexts  <a href="#">ISA Social Studies (all)</a>            Develops an argument based on compelling evidence that considers multiple perspectives.</p> <p><b>English:</b>  <a href="#">ISA ELA--Analysis &amp; Inquiry, Reflection &amp; Advocacy</a>            Analyzes and evaluates the ideas and arguments presented in print, visual, verbal, and multi-media texts.            Uses language and multi-media to present a clear and compelling position of advocacy.</p> <p><b>Math:</b>  <a href="#">ISA Math--Connections</a>            Uses data generated by mathematical processes or models to make decisions</p> <p><b>Other:</b>  <a href="#">ISA Global Leadership</a>            Recognize that resources are limited, consider environmental, economic and social theories of resource use and conservation, and articulate points of view on resource usage.   <a href="#">ISA Technology—Research and Information Fluency</a>            Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.</p>	<b>Transfer</b>	
	<p><i>Students will independently use their learning to...</i></p> <p>verbally advocate for an assigned policy option from an assigned roll, during a simulation in which they work in teams to influence a mock Presidential Advisory Panel on Environmental Issues.</p>	
	<b>Meaning</b>	
	<p><b>Understandings</b>  <i>Students will understand that...</i></p> <ul style="list-style-type: none"> <li>• Global environmental problems (overpopulation, pollution, climate change, biodiversity) are important international issues that do not recognize country borders.</li> <li>• Political systems create policies that impact global environmental problems.</li> <li>• Good evidence is crucial to a good argument.</li> <li>• In order to recognize multiple perspectives, sometimes one must argue a position contrary to one's personal beliefs.</li> </ul>	<p><b>Essential Questions</b></p> <ol style="list-style-type: none"> <li>1. What are the global environmental problems?</li> <li>2. What causes these problems to manifest?</li> <li>3. What challenges and trade-offs do we face as we deal with environmental problems?</li> <li>4. How does a general point of view translate into specific policy recommendations for governmental action?</li> </ol>
<b>Acquisition</b>		
<p><b>Knowledge</b>  <i>Students will know...</i></p> <ul style="list-style-type: none"> <li>• Increased quality of life leads to greater impact on the planet's resources (deforestation, desertification, extinction of species, climate change, water quality, acid rain, etc.)</li> </ul>	<p><b>Skills</b>  <i>Students will be able to...</i></p> <ul style="list-style-type: none"> <li>• Research the Internet to find credible information (factual as well as illustrative) supporting their assigned position.</li> <li>• Collaborate with others in multiple contexts.</li> <li>• Deliver an effective speech to an audience of peers and judges.</li> </ul>	

**Stage 2 – Evidence**

CODE (M or T)	Evaluative Criteria (for rubric)	
T  T  T   A A  M  M M T	The final presentation <a href="#">rubric</a> includes the categories of Position (clarity and accuracy), Evidence, Response to Questions, Use of Visual, and Speaking Style	<p>Performance Task(s) <i>Students will demonstrate meaning-making and transfer by...</i></p> <ul style="list-style-type: none"> <li>• Collaborating with 3 other teammates to draft a coherent plan for presentation to the panel during the simulation</li> <li>• Researching, preparing, and delivering an individual 2-min formal speech, with visuals</li> <li>• Responding appropriately to questions by the panel</li> </ul> <hr style="border-top: 1px dashed black;"/> <p>Other Evidence (e.g., formative)</p> <ul style="list-style-type: none"> <li>• Biology concepts will be quizzed in that class.</li> <li>• Worksheets from the Choices curriculum are graded in both World Geo and Biology classes.</li> <li>• Discussions of the novel <u>Ishmael</u> (with its environmental themes) will occur in English class.</li> <li>• Written speeches will be graded by World Geo teacher.</li> <li>• Visuals will be assessed by Technology teacher.</li> <li>• Delivered speeches will be graded by an independent panel using the rubric.</li> </ul>

**Stage 3 – Learning Plan**

CODE (A, M, T)	<b>Pre-Assessment</b> (respond in writing or via discussion)
	What are global problems? How would you weigh the challenges and trade-offs involved in protecting the global environment? What caused these problems to manifest?

Learning Activities			
	World Geography	Biology	Progress Monitoring
M	Hook: <a href="#">Presentation</a> (done in either class or in an assembly)		
A A	<b>Lesson 1</b> <b>Global Population Growth</b> Power of Pyramids (Population Connection)	<b>Lesson 1</b> <b>Communities &amp; Resources</b> “Cougars” Resource Simulation Symbiosis Cube Activity (Population Connection)	In English, begin reading and discussing <u>Ishmael</u> .
A A	<b>Lesson 2</b>	<b>Lesson 2</b>	Lab Report?

	<b>Global Population Growth</b> Human Population J Curve Who Polluted the Potomac (Population Connection) HW Reading: "Rising Tide of Poverty"	<b>Exponential Growth</b> Bean Hunting-Exponential Growth Lab Dot Video (Population Connection)	
A A M	<b>Lesson 3</b> <b>Global Trends In Quality of Life, Land Use, Energy Consumption, &amp; Wealth</b> Food for Thought Living on \$500 A Year (Population Connection)	<b>Lesson 3</b> <b>Carbon Cycle</b> Following the Path of the Carbon Cycle (Choices: pages 25-29) HW: Carbon Cycle Study Guide (Choices: page 23)	In Math class: evaluate CO <sub>2</sub> data over time (Choices p. 22-27)
A A&M T	<b>Lesson 4</b> <b>Global Environmental Problems</b> GEP Reading (Choices: pages 2-8) GEP Study Guide (Choices: page 5)	<b>Lesson 4</b> <b>Emissions</b> Methane Matters (Population Connection-Earth Matters) Carbon Footprint	Study Guide
	<b>Lesson 5</b> <b>Earth/Sun Relationships</b> Quiz: GEP Reading Earth/Sun Demonstration	<b>Lesson 5</b> <b>Biomes &amp; Effects of Change</b> Biome Jeopardy Effects of Climate Change on Biomes	Quiz, Game
A A&M	<b>Lesson 6</b> <b>Environment &amp; Economic Development</b> The Environment & Economic Development Reading (Choices: pages 9-16) Environment & Economic Development Study Guide	<b>Lesson 6</b> <b>Acid Rain &amp; Air Pollution</b> Acid Rain Lab Nitrogen Cycle HW Reading: "Gasping for Clean Air" (Population Connection-Earth Matters)	Lab Report
A A	<b>Lesson 7</b> <b>International Environmental Issues</b> Environmental Issues on the International Agenda Reading (Choices: pages 17-24) International Environmental Issues Study Guide (Choices: pages 20-31)	<b>Lesson 7</b> <b>Water Cycle &amp; Water Pollution</b> Water, Water, Everywhere Reading (Population Connection-Earth Matters) Water Cycle	In Media class, explore Internet search methods
A A	<b>Lesson 8</b> <b>Stakeholders of the Amazon</b> Environment and the Economy in the Amazon Region (Choices: pages 7-17)	<b>Lesson 8</b> <b>Diffusion, Osmosis, &amp; Aquifers</b> Diffusion & Osmosis Review Aquifers & Aquifer Pollutants (Sources: Unknown at this time)	
A A	<b>Lesson 9</b> <b>Deforestation</b> "The Unkindest Cut": Reading and Discussion (Population Connection-Earth Matters)	<b>Lesson 9</b> <b>Oxygen Cycle</b> Oxygen Cycle Clear Cut Effects (Sources: Unknown at this time)	In Media class: digital citizenship lesson about source materials.
A&M A	<b>Lesson 10</b> <b>Loss of Biodiversity</b>	<b>Lesson 10</b> <b>Connections</b>	

	<p>“Answering the Call”  “Bye, Bye, Birdie” (Population Connection-Earth Matters)</p>	<p>Niches, Webs, Chains, Pyramids  (Sources: Unknown at this time)</p>	
A	<p><b>Lesson 11</b>  <b>Game Show Network</b>  Go for the Green! (Population Connection-Earth Matters)</p>	<p><b>Lesson 11</b>  <b>Connections (cont.)</b>  Energy Flow, Decomposition, Cycling  (Sources: Unknown at this time)</p>	game
M A	<p><b>Lesson 12</b>  <b>Public Awareness</b>  “The Lorax” by Dr. Suess  Writing Activity</p>	<p><b>Lesson 12</b>  <b>Biodiversity</b>  A World of Difference  Hotspots  (Sources: Unknown at this time)</p>	<p>How does the novelist of <a href="#">Ishmael</a> advocate for his beliefs through the novel? Write an essay through English class.</p>
T	<p><b>Lesson 13</b>  <b>Research Assigned Roles</b>  1. The Economist  2. The Scientist  3. Domestic Policy Analyst  4. Foreign Policy analyst  5. Presidential Advisory Panel Member  (Choices: pages 34 &amp; 36)</p>	<p><b>Lesson 13</b>  <b>Research Assigned Roles</b>  1. The Economist  2. The Scientist  3. Domestic Policy Analyst  4. Foreign Policy analyst  5. Presidential Advisory Panel Member  (Choices: pages 34 &amp; 36)</p>	<p>Students will explain their role.</p>
T	<p><b>Lesson 14</b>  <b>Policy Options</b>  Putting the Economy First  Taking the Lead in the Green Economy (Choices: pages 30-34)  <i>Students will explain, in general, how their role would argue for each position.</i></p>	<p><b>Lesson 14</b>  <b>Policy Options</b>  Promoting Sustainable Development  Protecting Mother Earth (Choices: page 30 and pages 35-38)  <i>Students will explain, in general, how their role would argue for each position.</i></p>	
T	<p><b>Lesson 15</b>  <b>Group Formation &amp; Research</b>  <i>Students will develop a well-researched argument with evidence.</i></p>	<p><b>Lesson 15</b>  <b>Group Formation &amp; Research</b>  <i>Students will develop a well-researched argument with evidence.</i></p>	
T	<p><b>Lesson 16</b>  <b>Research &amp; write speeches</b></p>	<p><b>Lesson 16</b>  <b>Research &amp; write speeches</b></p>	Grade written speech
T	<p><b>Lesson 17</b>  <b>Pull Out/Prep/Simulation</b></p>	<p><b>Lesson 17</b>  <b>Pull Out/Prep/Simulation</b></p>	<a href="#">Rubric</a>
A&M&T	<p><b>Extension:</b>  Travel to Heifer Village in Arkansas to live in simulated developing-world communities and to learn about sustainability in a hands-on environment.</p>		Journal and blog post