



You're Invited!

Language Arts

Background: The chairperson of the Global Nations International Climate Summit (GNICS) invites and challenges students to learn about climate change through a simulation involving different countries from around the world. Students will participate in a role-playing scenario as members of these different countries. Each country has been affected by climate change and students are challenged to investigate probable causes and determine the best mitigation options for their country.

Goal: Students are introduced to the scenario and are challenged to investigate the evidence of climate change along with the probable causes and mitigations for their assigned country.

Objectives: Students will ...

- Develop a basic understanding of some of the ways in which the climate of the world is changing
- Explore and consider evidence from countries from around the world

Materials (for a class of 30):

- Suit jacket costume or some other costume for the chairperson
- 10 – 8½" x 11" sheets of white paper for each group to design their flag
- Markers or crayons to decorate flags
- You're Invited! – Country Role Cards
- 30 You're Invited! – Definitions Sheets
- You're Invited! – Chairperson Script
- 30 You're Invited! – Student Sheets
- You're Invited! – Teacher Transparency
- A box labeled with each of the following items with the country name on the item.
 - Ziralia – sunscreen
 - Infirdiddy – water bottle with an expensive price tag
 - Yanikia – fan
 - Napinsany – loaf of bread with an expensive price tag
 - Westmoasa – Ziplock bag filled with salt
 - Coolandria – stuffed polar bear
 - Gamtulala – umbrella
 - Nichicia – employment ads from the newspaper
 - Ebaliza – plastic lobster or crab
 - Unstattica – bug spray

Time Required: Two, 45-60 minute class periods

Standards Met: LA1, LA3, LA4, LA12, G1, G2, G6

Procedure:

PREP

- Recruit your principal or a parent to come in and introduce the scenario using the You're Invited! – Chairperson Script.
- Get a costume for the chairperson.
- Prepare box of items for each country for the chairperson.

PROCEDURE

- Explain to students that they will be learning about the Earth's climate.
- Hand out the You're Invited! –Definitions Sheets.
Go over the definitions and allow students to share what they know or connect with about the vocabulary.
- While you are explaining this, have the chairperson come in and read the You're Invited! – Chairperson Script.
- Divide students into 10 groups and hand each group a country role card.
- Hand out the You're Invited! – Student Sheet to each student.
- Countries should take time to brainstorm a design of their country flag and a national anthem.
- It might be helpful to provide examples of flags from countries around the world or states and discuss the symbolism within the flag.
- Hand out one 8½" x 11" sheet of paper for each country to draw their flag.
- Once groups have completed their flag and created a national anthem, have each country stand up read their role card with the country information. You can record their data on an overhead transparency so the other countries can compare their country to the others. They also need to discuss the symbolism on their flag and have them sing their national anthem.
- Next have them show the group the object they received from the box and discuss what they think the object represents to their country.
- Hang up flags on the wall near where the members of that country are seated.
- After all countries have presented, discuss similarities and differences within the countries. Use You're Invited!-Teacher Transparency for comparisons.
- Next have students brainstorm what next steps they should take regarding where they can get more information relating to the climate of their country. Make a suggestion that perhaps they should invite residents from their country to see what their opinion is as to what is happening in their country.

Assessment:

- Class participation in activity
- Completion of You're Invited! – Student Sheet



You're Invited! – Chairperson Script

Costume – Suit jacket or some other official outfit

Chairperson:

“Welcome Global Nations! I have recently received some materials from the citizens of your countries representing their concerns with some issues surrounding their climate.”

*Hand out each item to each country.

Ziralia – sunscreen

Infirdiddy – water bottle with an expensive price tag

Yanikia – fan

Napinsany – loaf of bread with an expensive price tag

Westmoasa – Ziplock bag filled with salt

Coolandria – stuffed polar bear

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“As chairperson of the Global Nations International Climate Summit (GNICS), I want to personally invite you to the first meeting GNICS. Countries around the world are getting ready to gather together to learn from each other about our global climate. I appreciate your eagerness to participate in this GNICS examining the atmospheric, environmental and other effects taking place within your countries. You are going to be members of these countries, and it is your country’s task during this Summit to investigate what is happening in your country related to climate change, then present the evidence from your country, investigate probable causes for these changes, and research your country’s best options for mitigating these changes. It is your challenge to find potential solutions for your country, and I look forward to hearing your potential solutions at the GNICS.

Let’s all work together to improve our lives together as Global Nations!”



You're Invited! – Student Sheet

Name _____ Date _____

I am a member of _____ (name of your country).

Use the space below to design ideas for your flag:

Our flag contains the following symbolism:

The object we received from the box was:

This object represents:



You're Invited! – Definitions Sheet

Acclimatize

To adjust to changes in environmental variables.

Adaptation

The responsive adjustment of a sense organ (as the eye) to varying conditions; the process of adapting to something (such as environmental conditions).

Anthropogenic

Having to do with man, or caused by humans.

Atmosphere

The area in which all air exists; this sphere contains all of the gases that surround the earth.

Biodiversity

A property of ecosystems related to the number of different plant and animal species they contain.

Biome

Major division of the ecological communities on Earth characterized by the plant and animal life of that region.

Biosphere

The area in which all living things exist; this sphere includes all of the microorganisms, plants and animals of Earth, even humans.

Carbon Dioxide (CO₂)

A colorless, odorless, incombustible gas. CO₂ is formed during respiration, combustion and organic decomposition, and used in food refrigeration, carbonated beverages, inert atmospheres, fire extinguishers and aerosols.

Carbon sink

A place where carbon accumulates and is stored. For example, plants and trees are carbon sinks; they accumulate carbon dioxide during the process of photosynthesis and store it in their tissues as carbohydrates and other organic compounds.

Carbon source

A place where carbon is produced or released. For example, plants release carbon in the form of carbon dioxide when their tissues are broken down during combustion. In addition, cars release carbon dioxide as they burn gasoline, and power plants release carbon dioxide when they burn fossil fuels to generate electricity.

Chlorofluorocarbon (CFC)

Anthropogenic aerosol compound containing chlorine, fluorine and carbon that is used in propellants, refrigerants and solvents; freon.

Climate

Long-term pattern of weather that characterizes a region.

CO₂ Sequestration

The process of removing carbon dioxide from the atmosphere and making it unavailable for release back to the air.

Cryosphere

The sum total of earth's fresh water supply that is locked up in frozen forms including polar ice, mountain glaciers, permafrost and snow.

Cyclone

An area of low-pressure often associated with stormy weather.

Deforestation

The removal of trees from a previously pristine area, generally by logging to obtain lumber products.

Ecosystems

Communities of plants, animals and bacteria, generally composed of producers, consumers and decomposers that share a common physical and chemical environment.

Emission

Substance that is released or discharged, usually into the air; emit (verb).

Evaporation

The movement of gaseous water (water vapor) from the Earth's surface to the atmosphere; evaporate (verb).

Eustatic Sea Level Change

Changes in sea level caused by changes in the water volume of the world's oceans, such as those brought about by the formation or melting of mountain glaciers and polar ice caps.

Fixation of carbon

Another name for the photosynthetic process, whereby carbon is removed from the air and "fixed" or incorporated into plant tissues.

Fixed

A shorthand term for the "fixation of carbon," which is the process by which plants remove CO₂ from the air and incorporate it into their tissues.

Food chain

A sequence of organisms in an ecosystem in which each member feeds on the member below it.

Fossil fuels

Deposits of organic matter that have been altered over geologic time (since the Earth's formation) and can be burned for energy; for example, coal, crude oil and natural gas.

Global carbon cycle

The cyclical movement of carbon within the biosphere. Carbon is primarily removed from the air by plants during photosynthesis and by dissolving in bodies of water. Carbon is generally returned to the air via biological respiration, decomposition of organic matter, volcanic activity and society's industrial activities, including the combustion of fossil fuels.

Global climate change

A change in the long-term weather patterns that is characteristic of regions of the world.

Greenhouse gases

Gases such as water vapor, carbon dioxide and methane that are relatively transparent to the short wavelength solar radiation that emanates from the sun but that are fairly opaque to the longer wavelength thermal radiation that emanates from the surface of a planet. Other greenhouse gases include Nitrous Oxide, HFC's, SF₆ and CFC's but will not be covered in depth in this unit.

GDP (Gross Domestic Product)

This is one way to measure the size of an economy. It is the market value of all final goods and services within a country in a given period of time.

Hurricane

A tropical cyclone with winds in excess of 64 knots (74 mph).

Hydrocarbon

An organic chemical compound consisting only of carbon and hydrogen atoms in the gaseous, liquid or solid phase. (Greek hydro, water + Latin carbo, charcoal).

Hydrosphere

The area in which water exists; for the purpose of this module, this sphere includes all liquid water on Earth, such as rivers, lakes and oceans, all frozen waters such as glaciers, icebergs, and polar icecaps, and all water vapor.

Hypothesis

A supposition or idea about something. In the scientific realm, it generally relates to physical or chemical interactions among various entities of nature.

Ice age

A period of extensive glaciations over large portions of earth's continents accompanied by reduced global temperature and changes in atmospheric circulation.

Interest

An immediate underlying concern applied to a specific situation or issue that usually reflects a person's personal interest or motivation. Competing interests result from a difference in perspective and motivation.

Isostatic Sea Level Change

Changes in sea level caused by the rising or falling of various portions of the earth's crust.

Methane

An odorless, colorless, flammable gas, CH₄, the major constituent of natural gas, that is used as a fuel and is an important source of hydrogen and a wide variety of organic compounds.

Mitigation

To act in such a way as to cause an offense to seem less serious. Related to climate change, mitigation refers to actions that reduce greenhouse gas emissions at their source or actions that remove greenhouse gases from the atmosphere.

Particulate matter

Small particles of matter such as dust and soot that are suspended in the air.

Per Capita

Per unit of population (per person).

Permafrost

Ground that is permanently frozen.

Parts per million (ppm)

Unit of measure most often used to describe the amount of a particular gas or compound in the air or water; it is the proportion of the number of molecules of the gas or compound out of a million (1,000,000,000) molecules of air or water.

Photosynthesis

The process by which plants use sunlight, water and carbon dioxide to produce their food.

Plate Tectonics

A theory explaining the present and past locations of continents due to massive movement of the Earth's crust.

Preferred Action

What the stakeholder thinks should be done about the specific issue; what action, if any, the stakeholder says should be taken.

Precipitation

The movement of liquid or solid water (rain, sleet, snow, etc.) from the atmosphere to the Earth's surface; precipitate (verb).

Precipitation Efficiency

The efficiency with which atmospheric moisture is converted to precipitation, often described as the ratio of precipitation to total available moisture.

Proxy data

Data obtained from objects that are sensitive to climatic phenomena. Some examples are tree ring widths, ice cores, pollen deposits, glacier lengths and deep sea sediments. Analyses of such data can be used to provide estimates of past climate conditions, such as temperature, precipitation or wind speed.

Quad

A quadrillion BTUs, or the energy required to raise one quadrillion gallons of water one degree Fahrenheit. It is roughly equivalent to 1.05×10^{18} joules.

Shade-intolerant species

Plants that typically grow in places that receive lots of direct sunlight. They generally have high relative growth rates, highly-regulated stomata and thin leaves.

Shade-tolerant species

Plants that typically grow in places that receive less than full sunlight, such as the lower levels of a forest. They generally have low relative growth rates, open stomata and thick densely-packed leaves.

Stakeholder

Those individuals, groups, organizations and/or institutions that have a role in the problem and/or its solution and a stake in the outcome.

Topography

Having to do with elevation or "lay of the land," i.e., surface features.

Urban heat island

A region of warmer air temperature (relative to the surrounding countryside) in a metropolitan area. Urban heat islands have been documented to exist in cities with as few as a thousand inhabitants.

Vulcanism

Those processes collectively that result in the formation of volcanoes and their products.

Weather

Short-term (daily) changes in temperature, wind and/or precipitation in a region.

Definitions modified from <http://www.co2science.org/dictionary/define.htm> and <http://davem2.cotf.edu/ete/modules/climate/GCglossary.html>



You're Invited! – Country Role Cards

UNSTATTICA

Population: 301,139,947

Land Area: 9,161,923 km² (about ½ the size of South America)
33 people per km²

GDP Per Capita: \$43,866.65

General Information: A wide variety of landscapes including plains, mountains, flatlands, lakes, deserts, and forests and a variety of temperatures typically from temperate, arctic, and tropical make up the geography of Unstattica. Natural resources include coal, copper, lead, molybdenum, phosphates, gold, iron, mercury, nickel, zinc, timber, and natural gas.

Energy Consumption in quads: 100.1
CO₂ Emissions in million metric tons: 5,889

Number 1 in Energy consumption (*out of 214 countries*)
Number 1 in CO₂ Emissions

NAPINSANY

Population: 40,448,191

Land Area: 504,782 km² (approx. twice the size of Oregon)
80 people per km²

GDP Per Capita: \$33,700.00

General Information: The climate of Napinsany is typically temperate with hot summers and cold, cloudy winters. The geography is a combination of large, flat hills with mountains in the north. Natural resources include coal, lignite, iron ore, copper, lead, zinc, and mercury.

Energy Consumption in quads: 6.6
CO₂ Emissions in million metric tons: 355

Number 13 in Energy consumption (*out of 214 countries*)
Number 17 in CO₂ Emissions

WESTMOASA

Population: 195,000

Land Area: 2831 km² (about ½ the size of Rhode Island)
69 people per km²

GDP Per Capita: \$930.00

General Information: The country of Westmoasa is a combination of 9 volcanic islands. The interior of the islands are rocky and rugged. The typical climate is tropical and rainy. Natural resources include hardwood forests, fish, and hydropower.

Energy Consumption in quads: 0.003

CO₂ Emissions in million metric tons: 0.1

Number 186 in Energy consumption (*out of 214 countries*)

Number 175 in CO₂ Emissions

EBALIZA

Population: 294,385

Land Area: 22,806 km² (slightly smaller than MA)
13 people per km²

GDP Per Capita: \$7,800.00

General Information: Typically a tropical, hot and humid climate, the geography of Ebaliza is flat with a swampy coastal plain with a few low mountains. Natural resources include arable land, timber, fish, and hydropower.

Energy Consumption in quads: 0.015

CO₂ Emissions in million metric tons: 0.8

Number 174 in Energy consumption (*out of 214 countries*)

Number 152 in CO₂ Emissions

YANIKIA

Population: 36,913,721

Land Area: 569,250 km² (about twice the size of Nevada)
65 people per km²

GDP Per Capita: \$1,600.00

General Information: The climate varies from tropical along the coast to arid in the interior. The geography is made up of low plains to central highlands and fertile plateau in the west. Natural resources include limestone, soda ash, salt, gemstones, zinc, gypsum, wildlife and hydropower.

Energy Consumption in quads: 0.185

CO₂ Emissions in million metric tons: 12

Number 98 in Energy consumption (*out of 214 countries*)

Number 91 in CO₂ Emissions

GAMTULALA

Population: 12,728,111

Land Area: 108,420 km² (slightly smaller than TN)
117 people per km²

GDP Per Capita: \$5,400.00

General Information: Made up of a volcanic landscape, Gamtulala has many rivers and streams throughout the country made up of mostly mountains and forests. The temperatures are typically tropical and hot. It is a little cooler in the highlands. Natural resources include petroleum, nickel, fish, rare woods and hydropower.

Energy Consumption in quads: 0.193

CO₂ Emissions in million metric tons: 11

Number 90 in Energy consumption (*out of 214 countries*)

Number 94 in CO₂ Emissions

ZIRALIA

Population: 190,010,647

Land Area: 8,456,510 km² (slightly smaller than the US)
22 people per km²

GDP Per Capita: \$9,700.00

General Information: This country is mostly tropical but is temperate in the south. The geography is mostly flat to rolling lowlands in the north. It also has plains, hills and mountains. Natural resources include bauxite, gold, iron ore, manganese, phosphates, platinum, tin, uranium, and timber.

Energy Consumption in quads: 9.3

CO₂ Emissions in million metric tons: 346

Number 9 in Energy consumption (*out of 214 countries*)

Number 19 in CO₂ Emissions

COOLANDRIA

Population: 301,931

Land Area: 100,250 km² (slightly smaller than KY)
3 people per km²

GDP Per Capita: \$39,400

General Information: Winters in Coolandria are windy and damp. Summers typically tend to be cool as well. The geography is made up of mostly plateau interspersed with mountain peaks, ice fields and coasts deeply indented bays and fiords. Natural resources include fish, hydropower and geothermal power.

Energy Consumption in quads: 0.145

CO₂ Emissions in million metric tons: 2

Number 103 in Energy consumption (*out of 214 countries*)

Number 136 in CO₂ Emissions

NICHICIA

Population: 1,321,851,888

Land Area: 9,596,960 km² (slightly smaller than US)
138 people per km²

GDP Per Capita: \$5,300.00

General Information: Nichicia has extremely diverse climate from tropical in the south to subarctic in the north. It is made up of mostly mountains, high plateaus, plains, deltas and hills. Natural resources include coal, iron ore, petroleum, natural gas, mercury, tin, aluminum, lead, zinc and hydropower.

Energy Consumption in quads: 67.1

CO₂ Emissions in million metric tons: 5,205

Number 2 in Energy consumption (out of 214 countries)

Number 2 in CO₂ Emissions

INFIRDIDDY

Population: 1,129,866,154

Land Area: 3,287,590 km² (slightly smaller than 1/3 of US)
344 people per km²

GDP Per Capita: \$2,700.00

General Information: Infirdiddy has a wide variety of plains, deserts and mountains. The typical climate varies from tropical monsoon in the south to temperate in the north. Natural resources include coal, iron ore, manganese, petroleum, natural gas, and diamonds.

Energy Consumption in quads: 16.2

CO₂ Emissions in million metric tons: 1,199

Number 5 in Energy consumption (out of 214 countries)

Number 6 in CO₂ Emissions



You're Invited! – Teacher Transparency

Country Name	Population	GDP Per Capita	Rank-CO ₂ Emissions	Rank-Energy Consumption	Object from box and what it represents
Coolandria					
Ebaliza					
Gamtulala					
Infirdiddy					
Napinsany					
Nichicia					
Unstattica					
Westmoasa					
Yanikia					
Ziralia					