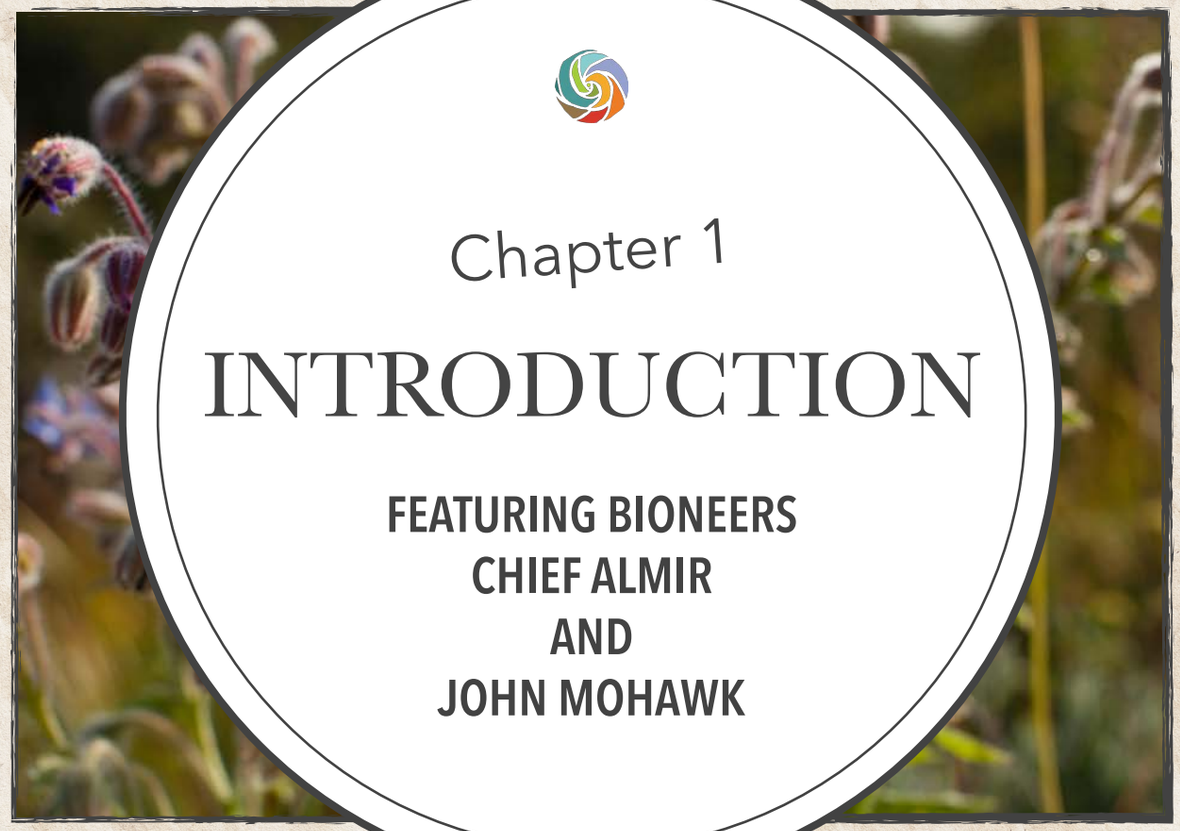
INDIGENOUS ESSENTIALS

= STUDY GUIDE I =










Chapter 1

INTRODUCTION

FEATURING BIONEERS
CHIEF ALMIR
AND
JOHN MOHAWK

Section 1

The Bioneers

CHIEF ALMIR NARAYAMOGA SURUI

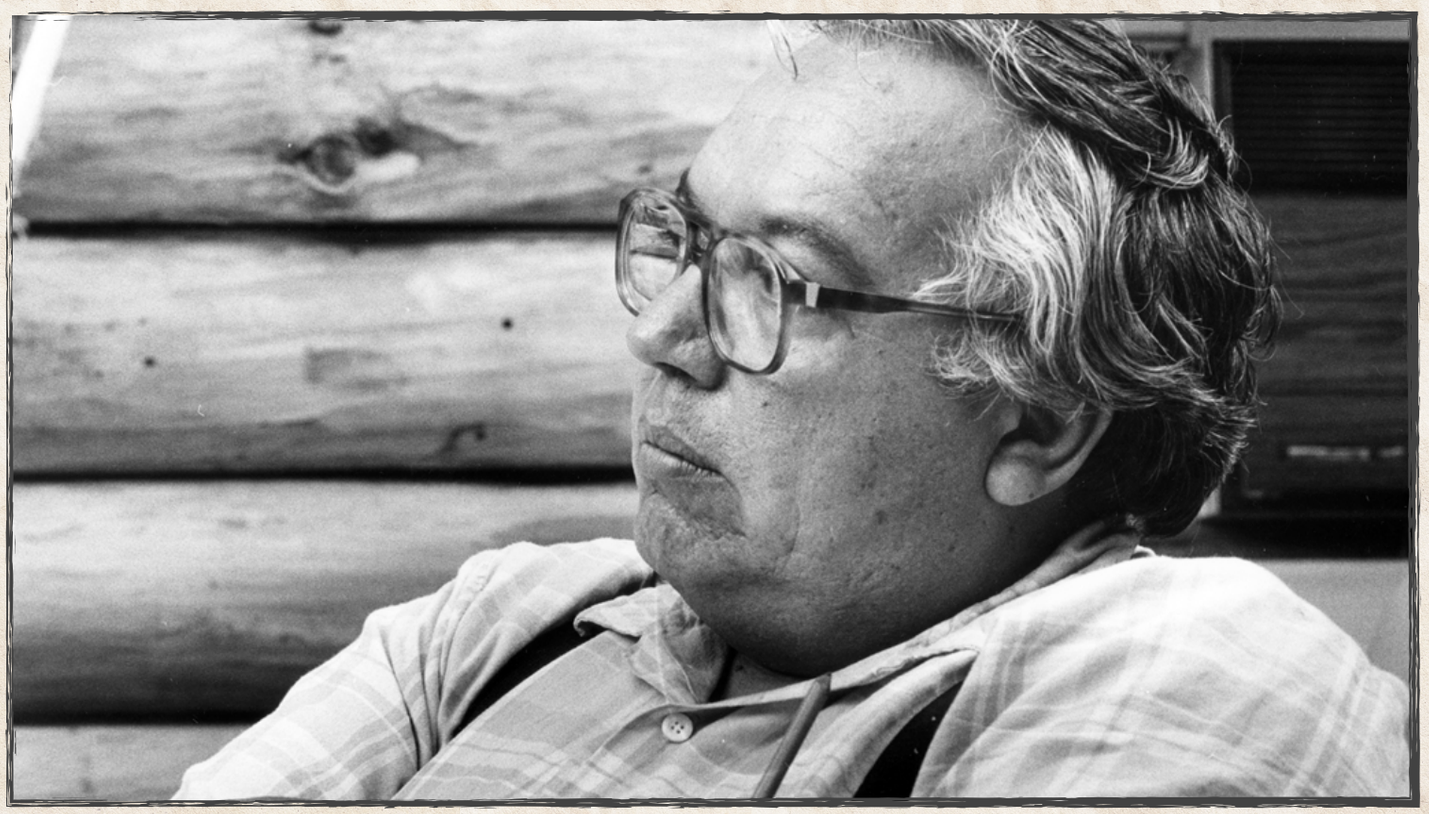
BIOCULTURAL CONSERVATION IN THE AMAZON

Led by Chief Almir Surui, the Amazonian Surui tribe employs the high technology of Google Earth to attain the conservation of the rainforest and assure their own survival.

JOHN MOHAWK

SURVIVE AND THRIVE

John Mohawk (1945-2006) was a revered Seneca Elder and Native American Scholar, as well as a vigorous advocate of Indigenous people's rights.



Section 2

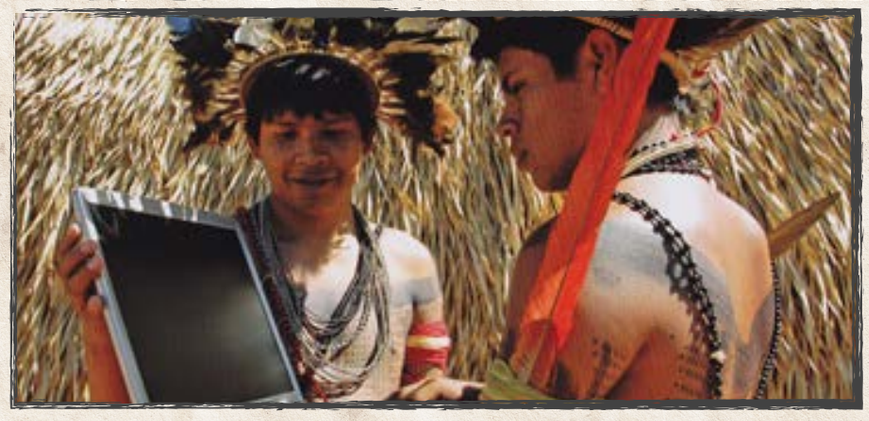
TOPIC OVERVIEW

TRADITIONAL ECOLOGICAL KNOWLEDGE AND BIOCULTURAL DIVERSITY

INDIGENOUS. NATIVE. TRIBAL. ABORIGINAL. FIRST.

Known by many names and inhabiting a variety of lands around the world, approximately 370 million Indigenous people make up only around five percent of the world's population.[1] Although these individuals are a minority in numbers, the amount of combined knowledge they possess is immeasurable. Handed down to new generations by elders, traditional knowledge encompasses everything from languages, cultural histories, and myths to the relationship with the natural world. This important ancestral wisdom has not only allowed cultures to survive untold generations, but also to lead sustainable lives and protect biological diversity. Even though it has the ability to benefit the world in numerous ways, Indigenous knowledge is largely in danger of disappearing from today's society.

The introduction of new technologies is changing many aspects of traditional ways of life. Increased or ongoing contact with the 'outside world' has caused some native populations to dwindle due to disease, conflict, or pressure to conform. When elders pass, their untold stories, skills, and guidance go with them. Because of this, mankind is also losing an average of one language approximately every two weeks.[2] With each elder or language lost, a large part of that culture also disappears. With each culture lost, an immense amount of knowledge and an important part of humanity vanishes. As anthropologist Wade Davis stated, "There is indeed a fire burning over the earth, taking with it plants and animals, ancient skills, and visionary wisdom...Quelling this flame and rediscovering a new appreciation for the diversity of human spirit as brought into being by culture is arguably the central challenge of our times."[3]



Section 3

INTRODUCTION

INDIGENOUS ESSENTIALS

TEK is an abbreviation for Traditional Ecological Knowledge. It refers to the combined knowledge and understanding of generations of Indigenous people on how to live in harmony with our world. TEK – short and simple. However, there is no way to abbreviate the volumes of knowledge and wisdom passed on by generations. It is this same Indigenous Knowledge that needs to be globally recognized and implemented to help save our world and ourselves.

More often than not, when someone hears, speaks, or reads about Indigenous people, Indigenous Knowledge is mentioned immediately. Perhaps the two are linked so closely for the simple reason that, in reality, you cannot separate them. Indigenous people live Indigenous Knowledge. Indigenous Knowledge maintains that everything you see is connected so you are in a constant reciprocal relationship with the earth, her creatures, and mankind. Therefore, everything has something to contribute to maintain this relationship. In addition, when you take action, it is essential to consider the outcome for generations to come. Indigenous people understand these principles and live accordingly.

It is this deep understanding of the impact of one's actions that non-Indigenous people need to learn and practice. It will be with this gained wisdom and new relation with the earth that we will not only live sustainably, but in a resilient way for the betterment of humanity and the planet for generations to come.

This necessary reciprocity runs through every aspect of our world. If we care for the earth, we receive plants. If we care for the plants, we receive nourishment and medicines. If we care for animals, we receive companionship, transportation, and nourishment. If we care for the waterways, we receive water, food, moisture for plants, and transportation for man. If we care for our forests, we receive nothing less than clean air to breathe.

Sadly, our modern, high-tech culture has been slow in realizing that many of our technological advances have come at the expense of our world. While instant communication via computers and cell phones is amazing, mining for the necessary materials to produce them is destructive to the earth. Although travel on land, air, and sea is convenient, the resulting air pollution and toxins are detrimental to the planet and ourselves. While it seems miraculous to be able to modify plants for surplus, we are altering some of our food to the point where it is no longer healthy for us to consume. And while it is incredible to be able to fell enormous trees for lumber, we are decimating the forests we desperately need to both supply and clean the air we breathe. In short, we are not living in reciprocal harmony with our world.

Fortunately, Indigenous people continue to step forward and offer their ancestral wisdom in vital areas such as farming, forestry, conservation, and sustainability.

Chief Almir of the Surui tribe of Brazil is one of many bearing such gifts. In 1969, his tribe experienced First Contact. Prior to this, the Surui were approximately 5,000 strong and lived in harmony with the rainforest. In less than fifty years the tribe dwindled to around 1,300 due to violence and disease. Yet in spite of their decline and destruction of their beloved rainforest, Almir reached out to the world that had nearly ended the Surui people. In 2008, wanting to share his Traditional Knowledge on how to work sustainably in the rainforest, Almir asked for help to spread his message. His work is a testament to his belief that together we can build a better future.

Another important mentor during our changing times has been John Mohawk of the Seneca tribe. He spent years sharing Indigenous Knowledge and working to help others appreciate and learn to live in balance with our world. His understanding and explanation of man's survival being dependent on the ability to adapt presents powerful support for their sustainable way of life. He gave warnings and expressed distress over corporations' disregard for maintaining the purity of plants, manipulating their DNA, and ignoring the unhealthy and potentially disastrous results. The question he posed is quite relevant, "Where's our relationship to those plants?" Native American pragmatism demands that one work toward a desirable outcome for future generations. Yet men, in the guise of corporations, are letting greed and unclear thinking guide them and are, thus, abusing various plants. Mohawk's heart-felt call for ending this destruction and turning to Native American pragmatism needs to be heard, understood, heeded, and lived – before it's too late.

For the sake of our planet and mankind, it is time for us to learn and follow the ways of the Indigenous people – to do no harm, to act with future generations in mind, and to realize that what we do to our world, we do to ourselves.

Chapter 2

CHIEF ALMIR SURUI

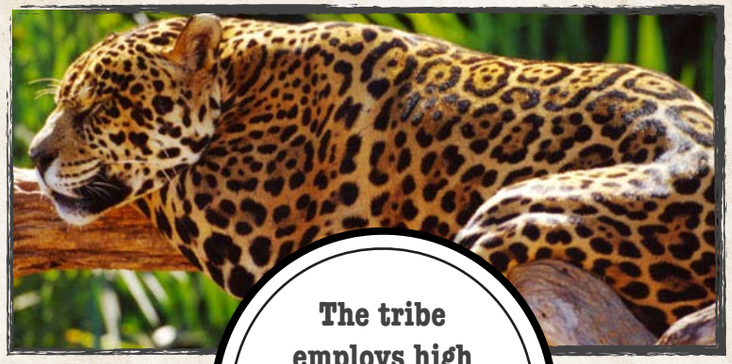
BIOCULTURAL CONSERVATION IN THE AMAZON

Section 1

BIOCULTURAL CONSERVATION IN THE AMAZON

BIONEER: CHIEF ALMIR

The Amazonian Surui tribe employs the high technology of Google Earth to attain the conservation of the rainforest and assure their own survival. Led by Chief Almir, the tribe has created the first REDD carbon forest business plan to conduct sustainable ventures from the forest. His opposition to logging, mining, agricultural, and other development interests in favor of more sustainable ventures in western Brazil has made him the target of death threats and violence.



The tribe employs high technology for conservation & survival

Section 2

VIDEO: BIOCULTURAL CONSERVATION

Chief Almir

In this astonishing presentation, Chief Almir Surui of the Amazon's Surui tribe shares the journey that resulted when the Amazon's Surui people first encountered the encroachments of Western civilization in 1969. Their leader, Chief Almir's father, confronted the bulldozers and armed men with his bow and arrow. Over the years, the Surui population dwindled to a fourth of its size at first contact and the surrounding rainforest was similarly decimated. Chief Almir Surui was sent by the tribe to attend college in a quest to learn how to save their way of life, where he encountered Google Earth on the Internet. He showed up on the doorstep of the Google-plex seeking help. A team from Google Earth Outreach journeyed to the Amazon, where it trained the Surui and 12 other tribes in how to map their lands and use the Internet to tell their story. The rest is history. (Interpreted live from Portuguese by Vasco Van Roosmalen from Amazon Conservation Team)

Movie 2.1 Chief Almir: Biocultural Conservation in the Amazon

Section 3 **FACTS & STATISTICS**

Stated Fact or Statistic	Update, More Info, and/or Source
Year of Speech	2009
First Contact	September 7, 1969[4]
Surui (also called Paiter) numbers before and after First Contact	As reported in multiple sources such as *Scientific American* and London's *The Independent*, before permanent contact between the Surui and the 'outside world' began in 1969, the tribe was ~5,000 members strong. After September 7, 1969, the population dwindled to around 300, partly due to disease. Today, the Surui population is approximately 1,300.[5]
Location	The 7th of September Reserve in Rondônia, western Brazil
Languages	Surui, Portuguese (official language of Brazil)
Software & Technology Used	e.g. Google Earth, YouTube, the Internet, Picasa, Google Docs, cell phones, GPS, geo tags, Open Data Kit, video, and photography[6]
Surui Forest Carbon Project	In order to better protect the forest and their way of life, the Surui became involved in a Carbon Project led by the Metareilá Association. While this program sought to fund various conservation actions by the Surui such as carbon stock management and species protection, the program's success is debatable.[7]
Supporting Companies Actively Involved in Efforts	Primarily Google Earth Outreach and Amazon Conservation Team
Examples of Opposition	Logging companies, mining companies, and smugglers

Section 4 **VIDEO GUIDE**

Time Stamps of English Translation:

Beginning Thanks

Introduction to the Surui's situation ~1:10

Using the Internet to communicate ~2:30

"Bring our message to the world…" ~3:40

Making a model for others ~4:35

Working with the forest ~5:05

Building Sustainability ~6:30

Messages from the planet ~8:15

Dialogue with the other world ~9:05

Need to work together ~10:30

There is still hope ~11:35

"I'm not asking…" ~12:05

Potential of the forest ~13:05

"We want to contribute…" ~13:45

Building a new reality together ~15:15

Section 5

DISCUSSION GUIDE

BIOCULTURAL CONSERVATION IN THE AMAZON

General Questions

refer to specific points, questions, and issues highlighted in the video

Insight Topics

topics that touch on current issues for discussion that cross academic disciplines

Critical Thinking Questions

questions that encourage students to think beyond the page and the video to address issues and find creative solutions

Conversation & Paper Starters

topics that could be posed for a class discussion or as a thesis for an individual paper or group report

General Questions

1. What is “First Contact” in relation to Indigenous tribes?

2. Name several threats affecting the Surui people and culture.

3. Chief Almir refers to numbers that made the Surui realize that if they didn’t act, their people and the forest could end. To what numbers was he referring? What did the Surui decide to do? What tools do they use?

4. Why is the Surui’s means of dialogue with the rest of the world significant?

5. Chief Almir says the forest isn’t “untouchable.” Explain his statement.

6. Why do you think Chief Almir believes it is important for the Surui to use their experience as a model for other tribes in similar situations? What are some ways in which they could accomplish this?

Insight Topics

1. In your own words, describe sustainability as if you were a member of the Surui tribe.

2. Describe several ways the modern world is working towards sustainability.

3. Outline how the Surui would likely develop the Amazon Rainforest economically, socially, and environmentally justly. Would this be similar to the modern world's development of the same forest? Why or why not?

4. Chief Almir stated he wants "to build a world of respect." Explain his use of the word respect.

5. Briefly explain the Surui's relation to the forest.

6. Chief Almir seemed to regard "world" and "planet" as two different entities when he stated, "*The world and our planet gives us many messages and those who can understand them, know that*." Explain the distinction. Is this important? Why or why not?

7. As quoted in the video, "*Some people have asked me, 'well, isn't the internet dangerous for you?' and he responds, 'what isn't?*'" Give an example of how the internet could be dangerous for the Surui people. Even though Chief Almir admitted the possible risk, why do you believe he uses such technology?

8. Chief Almir stated, "*When we decided to dialogue with the other world, we didn't want to be on top or on the bottom. We wanted to dialogue equally with respect to together build this better world*." Explain his use of the term "the other world." Why do you believe the Surui see it this way? Do you think his desire is attainable?

Critical Thinking Questions

1. Describe several possible pros and/or cons a typical First Contact situation can have on both Indigenous peoples and 'modern' society?

2. What Indigenous practices could be integrated into the Western/modern world in order to decrease the destruction of the environment?

3. Summarize one (or more) important lesson(s) that can be gleaned from Chief Almir's choice to use modern technology to help save his people and the forest.

4. In Chief Almir's statement, "*We need to work with her*," he refers to the forest as an active participant in the world. Interpret the Surui's relation to the forest and other physical features of the earth using his statement as one example.

5. Infer and detail several attributes of Chief Almir and his people that are indicated by these statements.

   "Our people are building this experience of sustainability with the forest and bringing it to the world through the technology and the internet so we can build a sustainable future."

   "We want to bring this model to other indigenous peoples, not just in the Amazon, but throughout the world, of how to use your resources sustainably."

6. Why do you believe Chief Almir thanked people "for sharing this message?" Why is it noteworthy?

Conversation & Paper Starters

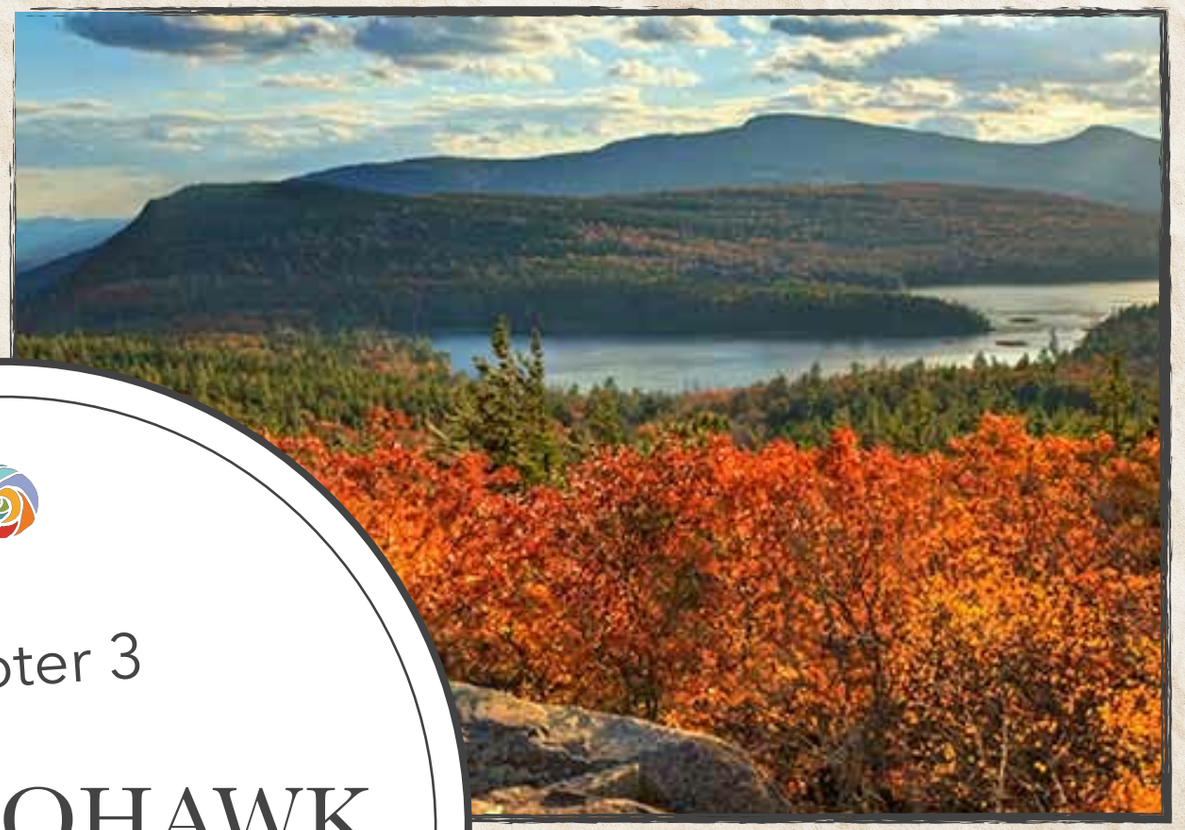
1. Compare the way of life of the Surui people prior to First Contact in 1969 to now, nearly 50 years later.

2. Chief Almir expressed, "*We as indigenous peoples alone cannot guarantee our (mankind's) future…each person has to do their bit…and believe that we can all work together to make this happen.*" Do you agree? Outline what you, your family, school, or community could do to help "guarantee our future?" Present at least 3 ideas.

3. Research how keeping a forest intact can be financially beneficial. Cite 3-5 examples of benefits for Indigenous peoples and modern corporations.

4. Chief Almir suggests sustainability of the forest leads to sustainability of the future. Do you agree or disagree? Give supporting evidence.

5. Explain how in the Surui culture the forest 'helps construct society.' Include its potential economic, social, spiritual, and physical influence and contributions.



Chapter 3

JOHN MOHAWK

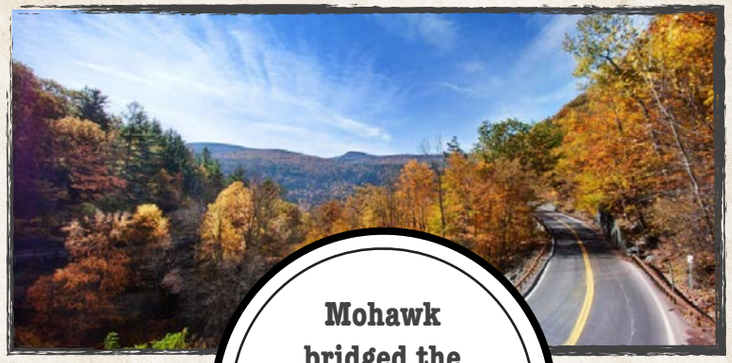
SURVIVE AND THRIVE

Section 1

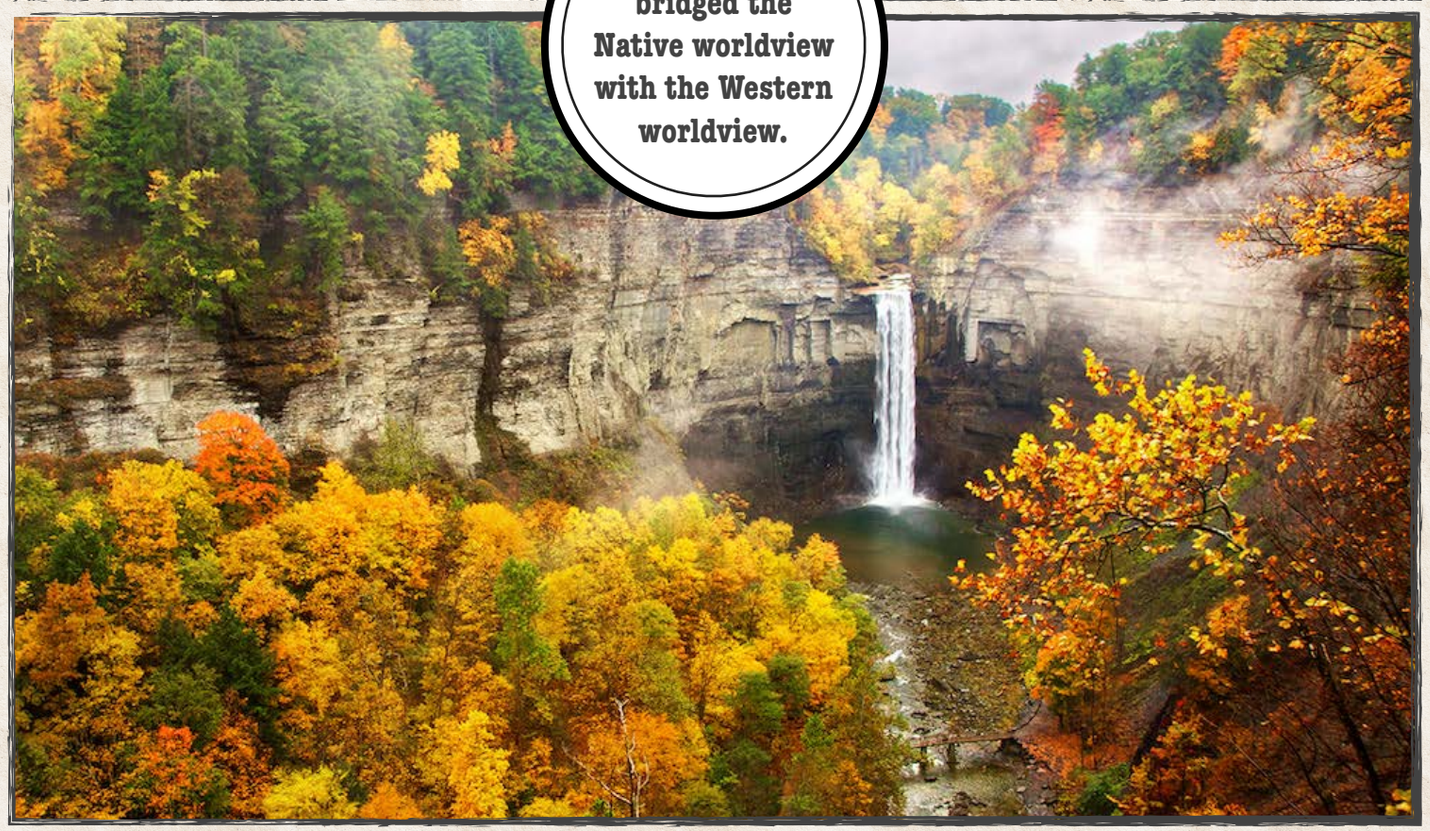
SURVIVE AND THRIVE

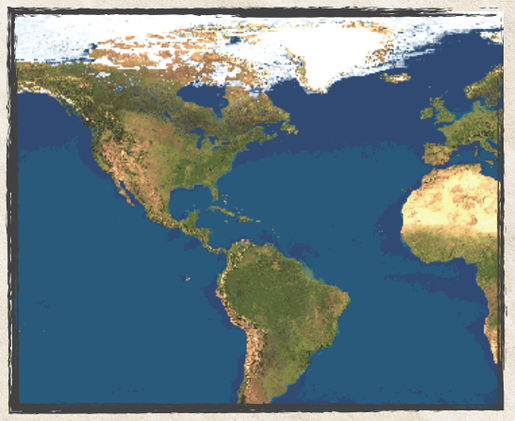
BIONEER: JOHN MOHAWK

John Mohawk, Ph.D. (1945-2006) was a Seneca elder, scholar, activist, farmer, and citizen diplomat who brought extraordinarily wide-ranging insights to the sweep of human history and bridged the post-modern Western world with the traditional worldview of Native peoples. The founder of the legendary journal, Akwesasne Notes (1967-1983), he was the Director of Indigenous Studies at the Center for the Americas at the State University of New York at Buffalo and a columnist for Indian Country Today. John authored several books, including Utopian Legacies: A History of Conquest & Oppression in the Western World. A vigorous advocate of Indigenous people's rights, he was a founding board member of the Seventh Generation Fund and the Indian Law Resource Center, and served as a member of the Six Nations Iroquois Confederacy Grand Council.



Mohawk bridged the Native worldview with the Western worldview.





Section 2

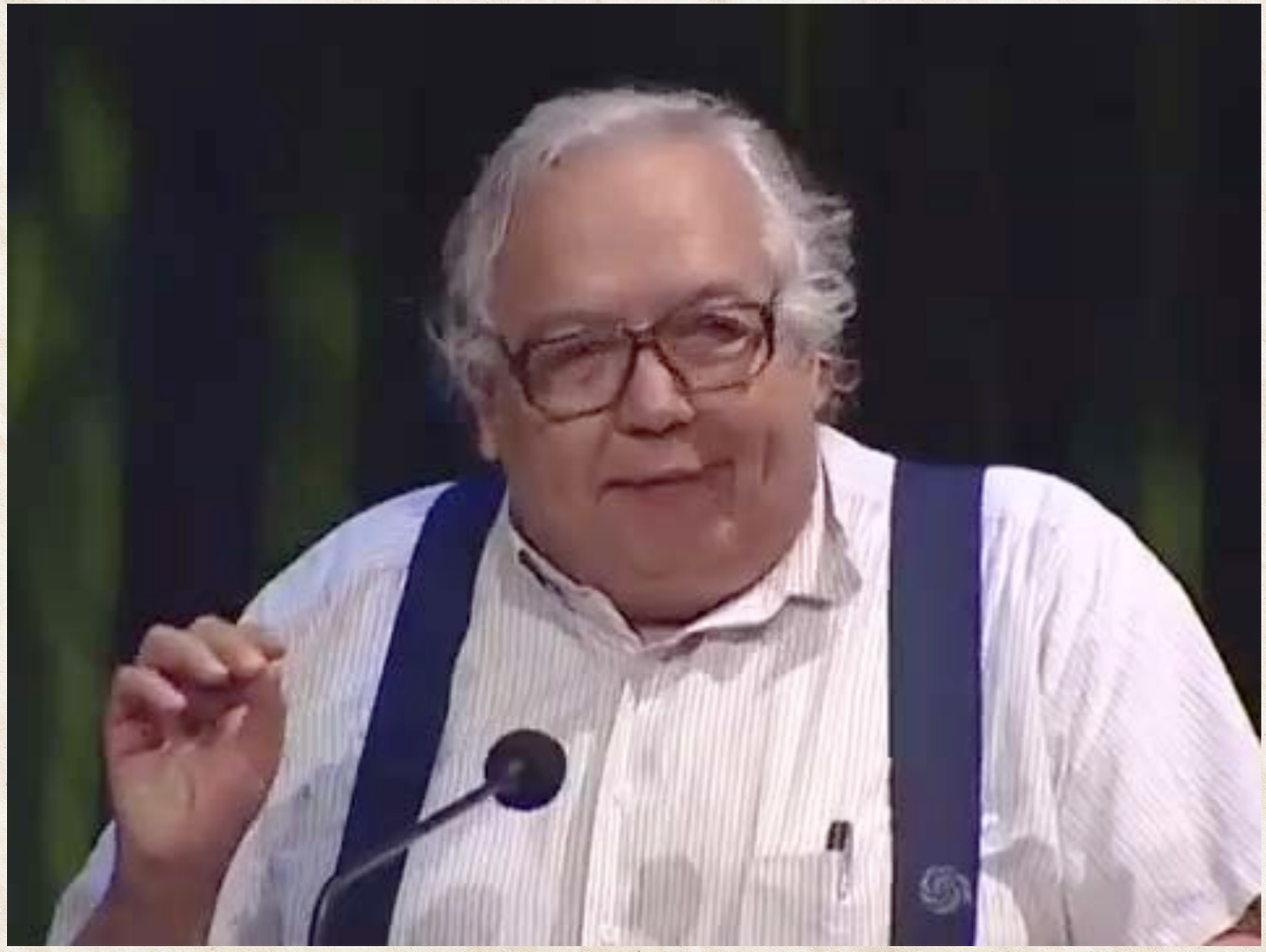
VIDEO: SURVIVE AND THRIVE

John Mohawk

In this expansive tour of human civilization leading to today's climate crisis, Native American scholar John Mohawk explores the interrelationship of climate change and human evolution. For most of our history as hunter-gatherers and farmers, we retained an intimate knowledge of the natural world that supported us, especially plants. That knowledge, he observes, is being lost at radical rates today. Re-establishing our intimacy and kinship with the plant world is key to surviving dramatic climatic changes.

He shares insights about the "Native American pragmatism" that successfully balanced the practical with the spiritual for thousands of years. Prior societies have faced climate change, and he offers invaluable insights into how the lessons learned by Indigenous peoples over thousands of years can be reinvented into survival techniques for both people and plants.

Movie 3.1 John Mohawk: Survive and Thrive



Section 3 **FACTS & STATISTICS**

Stated Fact or Statistic	Update, More Information, and/or Source
Year of Speech	2004
19th century thought on Native Americans	Native Americans were often viewed as 'inferior' and forced off their lands. The offer of citizenship for all Native Americans born on U.S. soil did not arrive until June 2, 1924. However, several state governments did not allow Native Americans to vote until the mid 1950s.[10]
Amount of corn in the U.S.	According to the National Corn Growers Association, approximately 87.4 million acres of corn were harvested in the United States in 2012. This equaled around 32% of the world's corn supply.[11]
Gulf of Mexico's watershed	Pollutants, such as nitrogen-rich fertilizers, from United States' corn fields often enter the Mississippi River as runoff and empty into the Gulf of Mexico causing a low-oxygen "dead zone." Experts estimate the size of the "dead zone" to be ~5,400 square miles for 2015.[12]
Monsanto	Monsanto is a large agricultural company that sells such items as seeds and herbicides to farmers worldwide. Its use of biotechnology and sale of genetically-modified seeds is well-known, extremely controversial, and has led to protests around the world.[13]

Section 4 **VIDEO GUIDE**

Time Stamps of English Translation:

Beginning & Native American intelligence ~0:45

Worldview & "Snowball Earth" ~1:20

Radiation of humans ~3:05

Hunter-gatherers to domestication of food ~3:30

Issues with the domestication of plants ~4:20

Survival Plants ~5:30

Human adaptation ~6:10

"Collective Human Heritage" ~7:00

A Story of Corn ~7:50

"Biological Savings Bank" ~9:40

The Seneca & Native American Pragmatism ~10:30

Thomas Banyacya & previous Worlds ~13:00

The Hopi Prophecy & "It's in their libraries…" ~14:50

A "revolution in thought" & Pre-Christian Thought ~16:10

Human adaptation to survive and thrive ~17:00

The concept of Global Warming & the Hopi's Four Worlds ~18:20

Relationships in Peril ~19:20

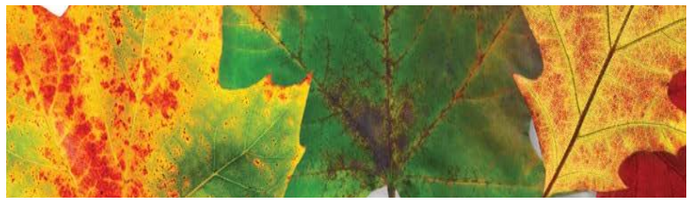
"Humans will survive" ~20:30

Section 5

DISCUSSION GUIDE

SURVIVE AND THRIVE

General Questions



refer to specific points, questions, and issues highlighted in the video

Insight Topics

topics that touch on current issues for discussion that cross academic disciplines

Critical Thinking Questions

questions that encourage students to think beyond the page and the video to address issues and find creative solutions

Conversation & Paper Starters

topics that could be posed for a class discussion or as a thesis for an individual paper or group report

General Questions

1. According to Mohawk, how did humans reduce the number of plants we now commonly consume? Give 2-3 reasons.
2. In your own words, define "survival plants."
3. How did humans survive when they began inhabiting new environments after "radiating out?"
4. Define "Collective Human Heritage" and explain its importance.
5. According to Mohawk, what is the key to a healthy relationship between a human society and a plant?
6. What is the "marvelous capacity of our species?" List supporting evidence Mohawk gives during his speech.

Insight Topics

1. How has Western culture's use and value of corn changed over the years? Include the term 'Biological Savings Bank' in your explanation.

2. What is the main concept of Native American pre-Christian thought outlined in the video? Describe in detail and include how this belief likely influences other aspects of Native American life.

3. Mohawk acknowledged there are many ways to "see the world." Why is recognizing this valuable?

4. Give a brief description of how and why humans moved from hunting and gathering to the domestication of food. List five or more changes brought about by this act.

5. Mohawk pointed out that when humans "radiated out" to new lands and environments, the prevailing thought was "how do I adapt to this place?" Does this differ from modern thought on adaptation? Support your statement.

Critical Thinking Questions

1. Describe how the majority of people typically view wild plants. How has this changed over time? Predict how this perspective may change over the next century and explain why this change might occur.

2. Mohawk related a story in which a group of Hopi stated, "*They already know this is true, they just haven't absorbed it yet.*" To what were they referring? Do you agree? Why or why not?

3. Mohawk stated, "*Humans will survive the next climate change, trust me. Humans will survive anything. Not necessarily corporations, though.*" Do you agree? Why or why not? What else might not survive? What will? Why?

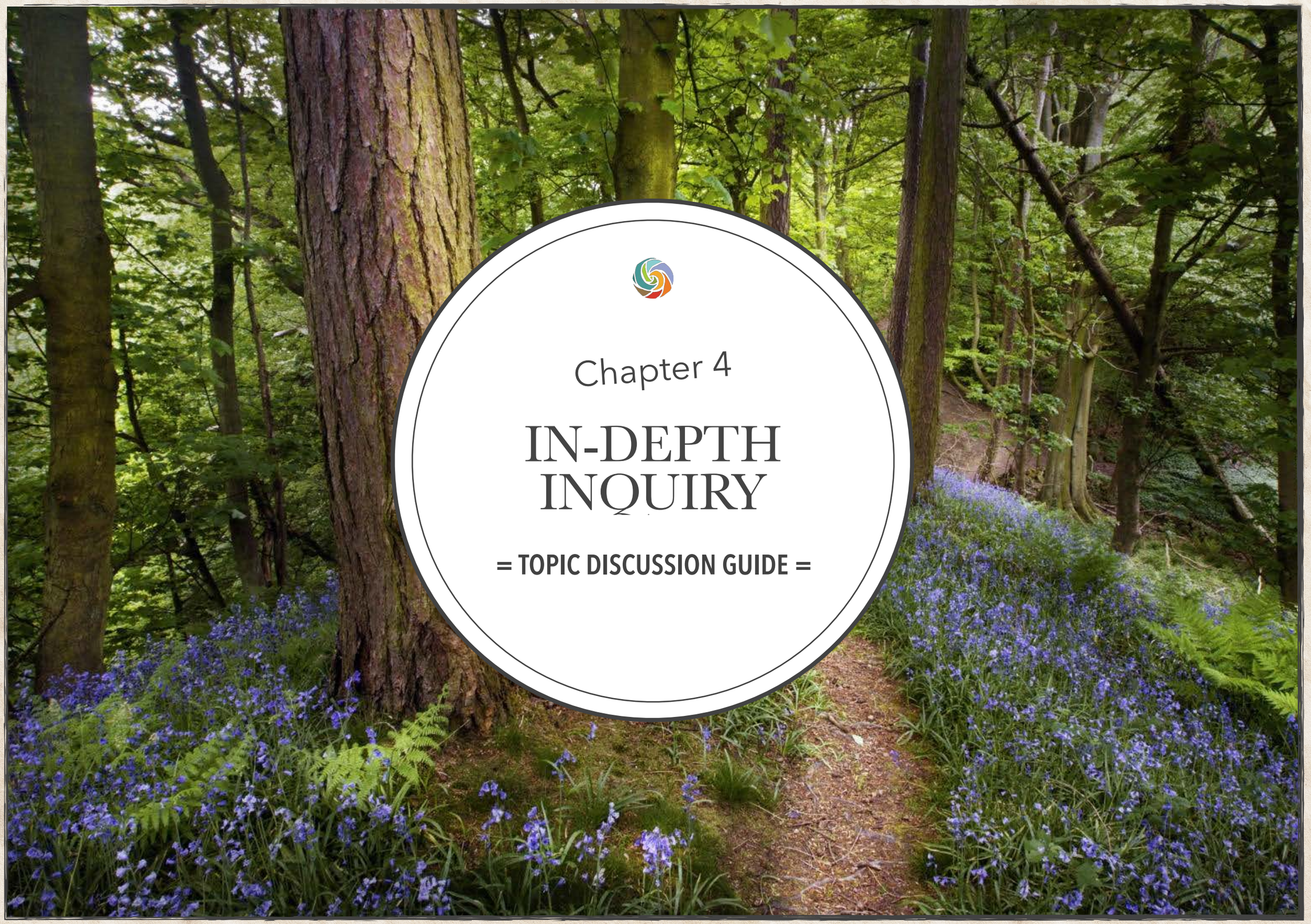
4. By incorporating traditional knowledge, find several creative solutions to improve modern day agricultural methods that have been found to harm the earth (e.g. pesticides).

Conversation & Paper Starters

1. Mohawk asked, "*When it comes our turn, when the climate change comes back, when the day after tomorrow turns into the day after the day after tomorrow, here's my question: 'Where's our relationship to those plants? Where are those plants?*"' How would you respond to this? Answer him in depth.

2. "*Contrary to the thinking of people who believe that civilization has been a movement from our lowest potential to our highest potential, it seems to be the history of food proves that that's not right.*" Summarize the history of food as presented in the video. Give evidence either supporting or disproving Mohawk's statement.

3. Research and summarize the Hopi story of the Four Worlds. How does this myth pertain to present day circumstances?



Chapter 4

IN-DEPTH INQUIRY

= TOPIC DISCUSSION GUIDE =

Section 1

DISCUSSION GUIDE

COMBINED

Insight Topics

topics that touch on current issues for discussion that cross academic disciplines

Critical Thinking Questions

questions that encourage students to think beyond the page and the video to address issues and find creative solutions

Conversation & Paper Starters

topics that could be posed for a class discussion or as a thesis for an individual paper or group report

Insight Topics

1. What are some commonalities between stereotypical Indigenous cultures and more technologically advanced cultures in regard to the environment?

2. Do you believe Indigenous cultures and modern society can exist side by side? Why or why not?

3. Indigenous cultures take into account outcomes on future generations when making decisions. How does this apply to their actions and beliefs with respect to sustainability?

Critical Thinking Questions

1. Indigenous knowledge often spans many generations and has enabled cultures to survive numerous plights over time. Very little indigenous knowledge has found its way into the mainstream or prevailing thought. Deduce several reasons why this is often the case. Explain in detail.

2. Mohawk defines Native American Pragmatism as "a way of thinking about the world that demands that the thinker look at the outcomes." Locate and describe 3-5 examples of how such pragmatism is incorporated into various Native American and other Indigenous ways of life.

3. Defend an increased integration of Indigenous knowledge in today's society. Include how its presence could affect the environment, economy, and quality of life.

4. Chief Almir and the Surui are using modern technology to help save their people and the forest. Considering his statements in this video, do you believe Mohawk would take a similar approach by incorporating modern methods in traditional ways? Support your answer.

Conversation & Paper Starters

1. Compare and contrast sustainability in the modern world versus in Indigenous cultures. Cite examples from both speakers.

2. Choose an Indigenous tribe and research its culture. Summarize what you find to be its core beliefs or philosophies. Compare your findings to that of a 'modern' society.

3. Choose one (or more) of the following quotes and thoroughly explain what the author meant by it. Do you believe the other speaker would agree or disagree? Give supporting evidence.

    1. "If we don't think about what we do, we bring a great threat to our future." (Almir)

    2. "I'm not asking here as a favor. The forest is not asking as a favor to exist. It is just asking to be able to contribute and continue and to have it recognized — its ecosystem services to each one of us." (Almir)

    3. "It is up to us and our conscience how we use these things (the internet and technology) and how we use them, whether it is for good or for bad." (Almir)

    4. "Native American studies as a discipline anticipates that there is an intelligence in the cultures of the Indigenous peoples of the Americas and that that intelligence can be discovered. This is completely contrary to the expectations of the 19th century in which they thought that there was no intelligence there." (Mohawk)

    5. "We can only domesticate the plants that allow themselves to be domesticated." (Mohawk)

    6. "In each of those places (i.e. deserts, islands, new locations), they had to come up with a culture that not only enabled them to survive, but they had to come up with a culture that made them thrive in it." (Mohawk)

Chapter 5

STANDARDS

ALIGNING STANDARDS FOR COURSE INTEGRATION

Section 1

ALIGNING STANDARDS

BIONEERS + STANDARDS

Bioneers' Study Guides Align with Standards

All Bioneers' Study Guides are aligned with national educational standards. Every video and corresponding Guide includes a detailed list of the specific standards met in each subject matter.

Given that the Study Guides offer many different avenues of inquiry and teachers can focus on various aspects of the material, not all standards listed may apply to the chosen discussion topics. However, all have been included for reference and convenience.

Included in this Study Guide:

- Next Generation Science Standards
- National Geographic Standards

HS-LS2-7.

Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

[Clarification Statement: Examples of human activities can include urbanization, building dams, and dissemination of invasive species.]

HS-LS2-8.

Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

[Clarification Statement: Emphasis is on: (1) distinguishing between group and individual behavior, (2) identifying evidence supporting the outcomes of group behavior, and (3) developing logical and reasonable arguments based on evidence. Examples of group behaviors could include flocking, schooling, herding, and cooperative behaviors such as hunting, migrating, and swarming.]

HS-LS4-6.

Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.

[Clarification Statement: Emphasis is on designing solutions for a proposed problem related to threatened or endangered species, or to genetic variation of organisms for multiple species.]

HS-ESS3-1.

Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

[Clarification Statement: Examples of key natural resources include access to fresh water (such as rivers, lakes, and groundwater), regions of fertile soils such as river deltas, and high concentrations of minerals and fossil fuels. Examples of natural hazards can be from interior processes (such as volcanic eruptions and earthquakes), surface processes (such as tsunamis, mass wasting and soil erosion), and severe weather (such as hurricanes, floods, and droughts). Examples of the results of changes in climate that can affect populations or drive mass migrations include changes to sea level, regional patterns of temperature and precipitation, and the types of crops and livestock that can be raised.]

HS-ESS3-3.

Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

[Clarification Statement: Examples of factors that affect the management of natural resources include costs of resource extraction and waste management, per-capita consumption, and the development of new technologies. Examples of factors that affect human sustainability include agricultural efficiency, levels of conservation, and urban planning.]

HS-ESS3-5.

Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

[Clarification Statement: Examples of evidence, for both data and climate model outputs, are for climate changes (such as precipitation and temperature) and their associated impacts (such as on sea level, glacial ice volumes, or atmosphere and ocean composition).]

HS-ESS3-6.

Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

[Clarification Statement: Examples of Earth systems to be considered are the hydrosphere, atmosphere, cryosphere, geosphere, and/or biosphere. An example of the far-reaching impacts from a human activity is how an increase in atmospheric carbon dioxide results in an increase in photosynthetic biomass on land and an increase in ocean acidification, with resulting impacts on sea organism health and marine populations.]

Section 3 **GEOGRAPHY STANDARDS**

Standard 2

How to use mental maps to organize information about people, places, and environments in a spatial context

- Developing Mental Maps

1. The locations, characteristics, patterns, and relationships of physical and human systems are the basis for mental maps at local to global scales

Therefore, the student is able to:

A. Identify from memory and explain the locations, characteristics, patterns, and relationships among human and physical systems, as exemplified by being able to

- Identify the pattern of human settlement in the world from memory and explain the common physical characteristics where the majority of settlements occur.
- Identify the locations from memory and explain the connections between major transportation networks and population centers.
- Identify the locations from memory of historical world civilizations and explain how cultural markers or examples still remain from the past

2. Mental maps can change through experience and iterative self-reflection

Therefore, the student is able to:

A. Explain the development of completeness and accuracy in the student's mental map of places and regions, as exemplified by being able to

- Explain how a new experience or encounter in an unfamiliar location resulted in added details or accuracy of the student's mental map of that place.
- Explain how the study of maps for game playing added details and accuracy to the student's mental map of a place or region.
- Explain how using a GPS or Web-based mapping application can aid in the development of a more complete and accurate mental map of places and regions.

- Using Mental Maps

3. Mental maps are used to answer geographic questions about locations, characteristics, patterns, and relationships of places and regions

Therefore, the student is able to:

A. Identify from memory and explain the locations, characteristics, patterns, and relationships of places and regions to answer geographic questions, as exemplified by being able to

- Identify from memory the locations and significant details that would inform a possible solution to a community-based environmental issue including an explanation of relationships or patterns in the details.

- Identify from memory the pattern of world population and explain the relationship of population settlement to land features and available renewable resources.

- Identify from memory the location of strategic choke points in shipping routes that are most likely to influence the route of trade goods in the future and explain the relationships between the United States and other countries controlling these strategic locations.

- Individual Perceptions Shape Mental Maps

4. Changing perceptions reshape mental maps of people, places, regions, and environments

Therefore, the student is able to:

A. Compare an individual's mental map before and after a geographic event or experience, as exemplified by being able to

- Compare students' mental maps created before and after a school or family trip to identify changes in the details and accuracy of the maps.
- Compare students' mental maps created before and after the study of world regions that are most likely to experience political change or restructuring.
- Compare students' mental maps before and after studying a current news event to identify how additional information translates into changes in understanding of the location.

Standard 3

How to analyze the spatial organization of people, places, and environments on Earth's surface

- Spatial Concepts

1. The meaning and use of complex spatial concepts, such as connectivity, networks, hierarchies, to analyze and explain the spatial organization of human and physical phenomena

Therefore, the student is able to:

A. Analyze and explain the spatial organization of people, places, and environments (where things are in relation to other things) using spatial concepts, as exemplified by being able to

- Construct various forms of geographic representations (hardcopy or digital maps, graphs, tables, or charts) to explain the spatial patterns of physical and human phenomena (e.g., maps that define a major watershed, composed of smaller watersheds and the hierarchies of streams and rivers within; maps that show the transportation networks within and between population centers of varying sizes to show hierarchies of cities, towns, and villages within a region).
- Construct data tables and digital maps using US Census data to analyze and explain the variability of population density in relation to the location of transportation nodes and networks.
- Construct and use various forms of geographic representations to explain that certain coastal urban centers gained locational, connectivity, and economic prominence (e.g., New Orleans, Calcutta, Rotterdam, Singapore).

- Spatial Models

3. Models are used to represent the structure and dynamics of spatial processes that shape human and physical systems

Therefore, the student is able to:

A. Analyze and explain the spatial features, processes, and organization of people, places, and environments using models of human and/or physical systems (e.g., urban structure, sediment transport, and spatial interaction), as exemplified by being able to

- Construct a model and explain the influence that spatial processes have on human and physical systems (e.g., urbanization and transportation; housing prices and environmental amenities such as water bodies, parks, or vistas; gardening associated with the growing season).
- Construct physical or digital models of a river valley and evaluate locations that may be suitable for different purposes (e.g., recreational sites, residential housing, resort hotels, industrial sites).
- Construct a model that shows how election strategists might determine which areas in the state should receive special attention and additional resources in advance of an election (e.g., political party membership, economic traits, past voter turnout).

Standard 6

How culture and experience influence people's perceptions of places and regions

The student knows and understands:

- The Perception of Places and Regions

1. People can view places and regions from multiple perspectives

Therefore, the student is able to:

A. Explain how and why people view places and regions differently as a function of their ideology, race, ethnicity, language, gender, age, religion, politics, social class, and economic status, as exemplified by being able to

- Explain how and why gated communities in wealthy suburban areas may be viewed differently by people from different socioeconomic groups.
- Explain how and why senior citizens and college students may view recreational destinations in Florida differently.
- Explain how and why groups of people may view a place differently (e.g., Harney Peak, South Dakota, viewed by the Lakota Sioux or the US Forest Service; Mount Fuji viewed by Japanese citizens or foreign tourists).

- Changes in the Perception of Places and Regions

2. Changing perceptions of places and regions have significant economic, political, and cultural consequences in an increasingly globalized and complex world

Therefore, the student is able to:

A. Explain the possible consequences of people's changing perceptions of places and regions in a globalized and fractured world, as exemplified by being able to

- Explain how international alliance networks are responses to changing views about places and regions (e.g., North Atlantic Treaty Organization [NATO], European Union [EU], Organization of American States [OAS]).

- Analyze the changes in the US perceptions of increasing consumer demand and consumption in emerging national economies, especially in such Asian nations as China, India, Singapore, and South Korea.

- Explain the consequences of people's changing perceptions of places due to natural and human disasters (e.g., reevaluating the use of artificial levees in New Orleans after Hurricane Katrina in 2005, decreased tourism after the eruption of Indonesia's Mount Merapi in 2010, responses to terrorist attacks on the World Trade Center in 1993 and 2001).

Standard 10

The characteristics, distribution, and complexity of Earth's cultural mosaics

- Characteristics of Culture

1. Cultural systems provide contexts for living in and viewing the world

Therefore, the student is able to:

A. Describe and explain the characteristics that constitute any particular cultural system (e.g., Amish, Japanese, Maori), as exemplified by being able to

- Describe and explain how the extended family networks and limited use of technology influence the Amish culture in the United States.
- Describe and explain the historical role of the caste system and arranged marriages in the Indian cultural system.
- Explain how local customs can contribute to a group's culture (e.g., lion hunting by Masai cattle herders in East Africa, outrigger canoe navigation by Pacific Island cultures).

B. Explain how different cultures provide contexts from which people may view the world differently, as exemplified by being able to

- Describe and explain how a current event might be viewed differently from the context of different cultures
- Explain how cultures may view the roles of women in society differently.
- Explain how cultures may have differing views of business practices (e.g., markets where prices are negotiated rather than fixed, bartering for goods versus purchasing them).

- Patterns of Culture

2. Cultural landscapes exist at multiple scales

Therefore, the student is able to:

A. Identify and analyze the spatial patterns of cultural landscapes at multiple scales, as exemplified by being able to

- Describe the cultural landscapes of two large cities in the United States and analyze the commonalities and differences of their built environments (e.g., Boston versus Los Angeles, Seattle versus Phoenix).
- Describe and analyze the characteristics of the cultural landscapes of different neighborhoods in a city (e.g., architectural styles, signage for businesses, density of the residents, amount of green space, type of economic activities conducted there).
- Analyze and explain the varying impacts of tourism on local cultural landscapes (e.g., cruise ship ports of call such as Prince Edward Island, Cozumel, and Venice; crowds at Angkor Wat with the needs of the local residents; ecotourism impacts versus highly commercialized resorts).

B. Explain differences in the human imprints on the physical environment of different cultures, as exemplified by being able to

Explain how predominant agricultural practices in different cultures result in different imprints on the physical environment (e.g., forest removal for cattle ranches in the Amazon, terrace construction for rice farming in China, changes in land use patterns as a result of center pivot irrigation in the western United States).

- Explain examples of the imprints on the physical environment of past cultures (e.g., the landscape of Egypt with pyramids and irrigation, Mayan temples and agricultural fields, Ancestral Puebloan cliff dwellings and field systems).
- Explain the differences in selected North American cultural hearths and how they influenced settlements.

- Cultural Diffusion and Change

3. Cultures change through convergence and/or divergence

Therefore, the student is able to:

A. Identify and explain examples of cultural convergence, as exemplified by being able to

- Explain examples of the spread of culture traits that contribute to cultural convergence due to globalization (e.g., US-based fast-food franchises in China and India, the dominance of the English language for use in business, replication of television programs or print media in other countries).
- Analyze the ways technology contributes to cultural convergence on a global scale (e.g., role of television, the Internet, more affordable air travel, cellular or mobile phone technology).
- Explain how multinational corporations and international business operations contribute to cultural convergence.

B. Identify and explain examples of cultural divergence, as exemplified by being able to

- Identify and explain examples of immigrant cultural groups maintaining language or other cultural markers in a new location to distinguish themselves from other groups.
- Explain how subculture groups in the United States adopt dress or other characteristics to distinguish themselves from other groups (e.g., Harley-Davidson motorcycle riders, Goths, the Amish).
- Identify and explain how different types of housing styles and developments may contribute to cultural divergence (e.g., gated communities retirement communities, suburban developments with home owner association covenants).

4. The rate of cultural change has increased as a result of globalization

Therefore, the student is able to:

A. Explain how and why globalization has increased the rate of change in cultures, as exemplified by being able to

- Explain how media, such as television, music, and films, can influence the rate of change in cultures around the world (e.g., youth preferences for types of music, knowledge of India diffused through the Indian film industry).
- Explain how the increased mobility of people, ideas, and information can result in increasing the rate of change in a culture (e.g., the spread of Internet social networking, development of smart phones and short-message-service [SMS] texting).
- Explain how the increasing economic interdependence in the world may result in an increased rate of change in cultures (e.g., expanding use of the Internet as an international marketing tool, increased frequency of business and trade shows involving people from across the world, changes in peoples' diets due to the spread of US fast-food franchises).

Standard 14

How human actions modify the physical environment

- Modification of the Physical Environment

1. Human modifications of the physical environment can have significant global impacts

Therefore, the student is able to:

A. Explain the global impacts of human changes in the physical environment, as exemplified by being able to

- Explain the spatial consequences, deliberate and inadvertent, of human activities that have global implications (e.g., dispersal of plant and animal species, fungi, and disease worldwide; global petroleum production, transport, and consumption; global climate change).
- Explain how changes in human behavior can result in the introduction of aerosols into the atmosphere that have effects on a global scale (e.g., dust from Chinese agriculture and industry affecting Hawaii's weather, dust from the Saharan Africa affecting weather in Florida).
- Explain the implications of modifying the physical environment in Brazil to grow soybeans for global export (e.g., siltation, desertification, deforestation, global climate change).

- The Use of Technology

2. The use of technology can have both intended and unintended impacts on the physical environment that may be positive or negative

Therefore, the student is able to:

A. Evaluate the intended and unintended impacts of using technology to modify the physical environment, as exemplified by being able to

- Evaluate how the technologies used in petroleum production and transportation have expanded the scale of the industry from local or regional to global over the last century (e.g., offshore oil drilling, oil sands, supertankers, pipelines).

- Evaluate various types of contemporary agricultural techniques (e.g., no-till farming, herbicides, pesticides, center-pivot application of chemicals, crop rotation, irrigation, increased acreage in production), and compare the positive and negative implications of using these techniques.

- Evaluate the environmental impact of road building into remote locations (e.g., rain forests in Brazil, old growth forests in Oregon, agricultural land in China, Alaskan pipeline in the Arctic).

- Consequences for People and Environments

3. People can either mitigate and/or adapt to the consequences of human modifications of the physical environment

Therefore, the student is able to:

A. Describe and evaluate scenarios for mitigating and/or adapting to environmental changes caused by human modifications, as exemplified by being able to

- Compare the costs and benefits of alternative solutions for a human-caused environmental problem, such as acid rain (e.g., coal with lower sulfur content, scrubbers on smokestacks, nuclear waste disposal, use of alternative energies) or urban heat islands (e.g., green roof construction, increased public transportation, energy efficient buildings).

- Explain and evaluate the policy implications of managing upstream development in relation to downstream impacts (e.g., flooding, dam construction or removal, zoning).

- Evaluate the feasibility, costs, and benefits of green construction techniques (e.g., Leadership in Energy and Environmental Design [LEED] certification) and describe how these efforts may increase sustainability and mitigate human impact on the physical environment.

Standard 15

How physical systems affect human systems

- Environmental Opportunities and Constraints

1. Depending on the choice of human activities, the characteristics of the physical environment can be viewed as both opportunities and constraints

Therefore, the student is able to:

A. Explain how people may view the physical environment as both an opportunity or a constraint depending on their choice of activities, as exemplified by being able to

- Explain how mountainous terrain may constrain some farming techniques due to a lack of flat areas and yet offer opportunities in growing crops that are only suited to high-elevation growing conditions.
- Explain how the ski industry and state roads departments may view the same mountainous region and its weather patterns as presenting both opportunities and constraints.
- Explain how the physical environment of the arid West of the United States presents both opportunities and constraints for human activities (e.g., the construction, use, and maintenance of golf courses, cultivation of cotton and citrus fruits, numerous outdoor swimming pools, water intensive lawns and landscaping).

- Environmental Hazards

2. Humans perceive and react to environmental hazards in different ways

Therefore, the student is able to:

A. Explain and compare how people in different environments think about and respond to environmental hazards, as exemplified by being able to

- Construct a list of environmental hazards and compare and contrast how people in developed and developing world regions prepare for and cope with the aftermath of these disasters.
- Construct and compare maps of recent wildfires and population distribution in Southern California and explain the reasons for and consequences of people building structures in the most vulnerable areas in this region (e.g., fire protection, insurance, financing, land values, quality of life, fuel suppression of vegetation).
- Explain how people from different parts of the country might have differing views on federal government insurance programs for areas susceptible to environmental hazards (e.g., hail insurance programs in Kansas, national flood insurance in Louisiana).

B. Explain how environmental hazards affect human systems and why people may have different ways of reacting to them, as exemplified by being able to

- Explain how volcanoes have sometimes been incorporated into local cultural traditions and lore by people who live with the unpredictability of eruptions rather than to relocate farther away from the hazard.
- Describe and explain the short- and long-term effects of hurricanes in the Gulf of Mexico and Atlantic coast on beaches, buildings, and human activities (e.g., insurance rates, zoning, building codes, beach replenishment, displaced populations).
- Compare the human responses to the potential predicted effects of climate change on different regions of Earth.

- Adaptation to the Environment

3. Societies use a variety of strategies to adapt to changes in the physical environment

Therefore, the student is able to:

A. Explain how societies adapt to reduced capacity in the physical environment, as exemplified by being able to

- Explain how societies historically adapted to reduced capacity in the physical environment (e.g., migration, limiting population growth, building aqueducts and cisterns) and predict locations where adaptation strategies might be required in the future.
- Explain how societies use technology in dealing with resource shortages amidst growing human populations (e.g., recycling used water, recycling paper products, converting to drip irrigation systems, development of new alternative energy sources).
- Describe and explain how societies may change their use of building materials in response to changes in the physical environment.

B. Analyze the concept of "limits to growth" to explain adaptation strategies in response to the restrictions imposed on human systems by physical systems, as exemplified by being able to

- Analyze how people have adapted to physical environments that vary in carrying capacity (e.g., slash-and-burn agriculture practices, nomadic herding or hunting, importation of needed products).
- Analyze the lifestyles of humans in extreme or island environments and explain strategies inhabitants use to survive and not overwhelm the limits of their environments (e.g., water collection and rationing in arid climates, Inuit seasonal seal hunting and fishing practices, Antarctic researchers using sustainable living practices).
- Identify world locations that have vulnerable environmental conditions (e.g., extreme temperatures, limited access to water, steep topography) and high population density and explain adaptation strategies used in these locations that address the limits to growth.

Standard 16

The changes that occur in the meaning, use, distribution, and importance of resources

- Types and Meanings of Resources

1. The meaning and use of resources change over time

Therefore, the student is able to:

A. Explain the relationship between the quest for resources and the exploration, colonization, and settlement of different regions of the world, as exemplified by being able to

- Describe the Columbian exchange of plant and animal resources and explain how this exchange changed patterns of food consumption around the world.
- Identify different types of resources (e.g., precious metals, spices, animal products) that drove the 15th- to 20th-century European process of exploration and colonization in North America, Africa, and Asia, and explain how this process influenced the spatial distribution of European colonies on those continents.
- Describe and explain how the prospect of gaining access to resources in the Arctic and Antarctic regions creates competition among countries with territorial claims.

B. Explain how globalization and higher standards of living affect the meaning and use of resources, as exemplified by being able to

- Explain why mass consumption associated with globalization requires enormous amounts of resources worldwide (e.g., energy to ship raw materials and finished goods worldwide, emerging consumer markets increase in demand for energy due to increased ownership and use of electrical devices).

- Explain fluctuations in world petroleum prices as a function of global changes in supply and demand (e.g., disruptions in supply due to political tensions, new suppliers such as Angola, environmental disasters such as oil leaks and spills).

- Explain how and why per-capita consumption of resources (e.g., petroleum, coal, electricity, steel, water, food) differs between developed and developing countries now and in the past.

- Location and Distribution of Resources

2. The spatial distribution of resources affects patterns of human settlement and trade

Therefore, the student is able to:

A. Analyze and explain the relationships between the spatial patterns of settlement and resources, by being able to

- Describe and analyze various thematic maps to understand the relationship between the distribution of resources (e.g., water, agricultural, mineral, and energy resources) and patterns of human settlement.
- Analyze and explain the growth and/or decline of US towns that have relied on nonrenewable fossil fuel extraction (e.g., petroleum, coal, natural gas) or flow resource energy production (e.g., hydroelectric, geothermal, solar, wind).
- Construct a map and explain how the spatial distribution of resources influences human migration patterns (e.g., guest workers in southwestern Asian petroleum-exporting countries, historic gold rushes and land grabs, hunters following animal migrations).

B. Analyze and evaluate patterns of trade in resources,as exemplified by being able to

- Analyze the positive and negative economic, social, and environmental consequences of extracting and/or using specific resources to trade in foreign markets (e.g., timber, coal, petroleum, uranium).
- Compare the per-capita incomes of countries that lead the world in the export of luxury crops (e.g., coffee, tea, tobacco, cacao) with countries that lead the world in the consumption of these crops and evaluate the positive and negative consequences of these trade relationships.
- Identify countries that lead the world in petroleum production and explain how petroleum wealth influences international economic and political relationships.

Standard 18

How to apply geography to interpret the present and plan for the future

- Using Geography to Interpret the Present and Plan for the Future

1. Geographic contexts (the human and physical characteristics of places and environments) provide the basis for analyzing current events and making predictions about future issues

Therefore, the student is able to:

A. Explain and evaluate the influences of the geographic context on current events and issues to make informed decisions and predictions about the future, as exemplified by being able to

- Identify different views regarding contemporary social and environmental challenges and analyze the geographic factors influencing the stakeholders and their preferred policies (e.g., visions from local citizens about the relative importance of privacy versus security, opinions from residents of multiple states about a shared resource and about mechanisms for seeking resolution, viewpoints from around the world about relationships between economic development, resource consumption, population, and environmental alteration).
- Evaluate the current zoning policies for high-crime areas in a metropolitan area and predict changes in zoning and land use that may positively affect the community.
- Analyze the geographic consequences on different continents of strategies for responding to a global health pandemic (e.g., effects of closing international airports, quarantine of ships or cargoes, implementation of immunization plans for susceptible populations).

B. Analyze and evaluate the connections between the geographic contexts of current events and possible future issues, as exemplified by being able to

- Evaluate the feasibility and long-range impacts in a series of scenarios for dealing with social and environmental issues (e.g., absorbing and dispersing refugees, responding to threats from global warming, managing the future of Antarctica).
- Analyze the geographic implications of storing low-level nuclear material in a given state or region (e.g., suitability of sites, distribution of population, transportation network and routes).
- Analyze the effects of current rates of population growth on long-term sustainability in different regions of the world.

- Changes in Geographic Contexts

2. The current and possible future causes and processes of change in the geographic characteristics and spatial organization of places, regions, and environments

Therefore, the student is able to:

A. Identify and explain the causes and processes of current and possible future changes in the geographic characteristics and spatial organization of places, regions, and environments, as exemplified by being able to

- Identify areas where people are engaged in nationalistic movements and analyze the potential of these groups to change the current political geographies of their nation states.
- Describe and explain the possible effects of new electronic communication technologies on everyday life.
- Describe and explain the possible effects of new routes and technologies on world trade patterns.

- Perceptions of Geographic Contexts

3. Multiple and diverse perceptions of the world must be taken into account to understand contemporary and future issues

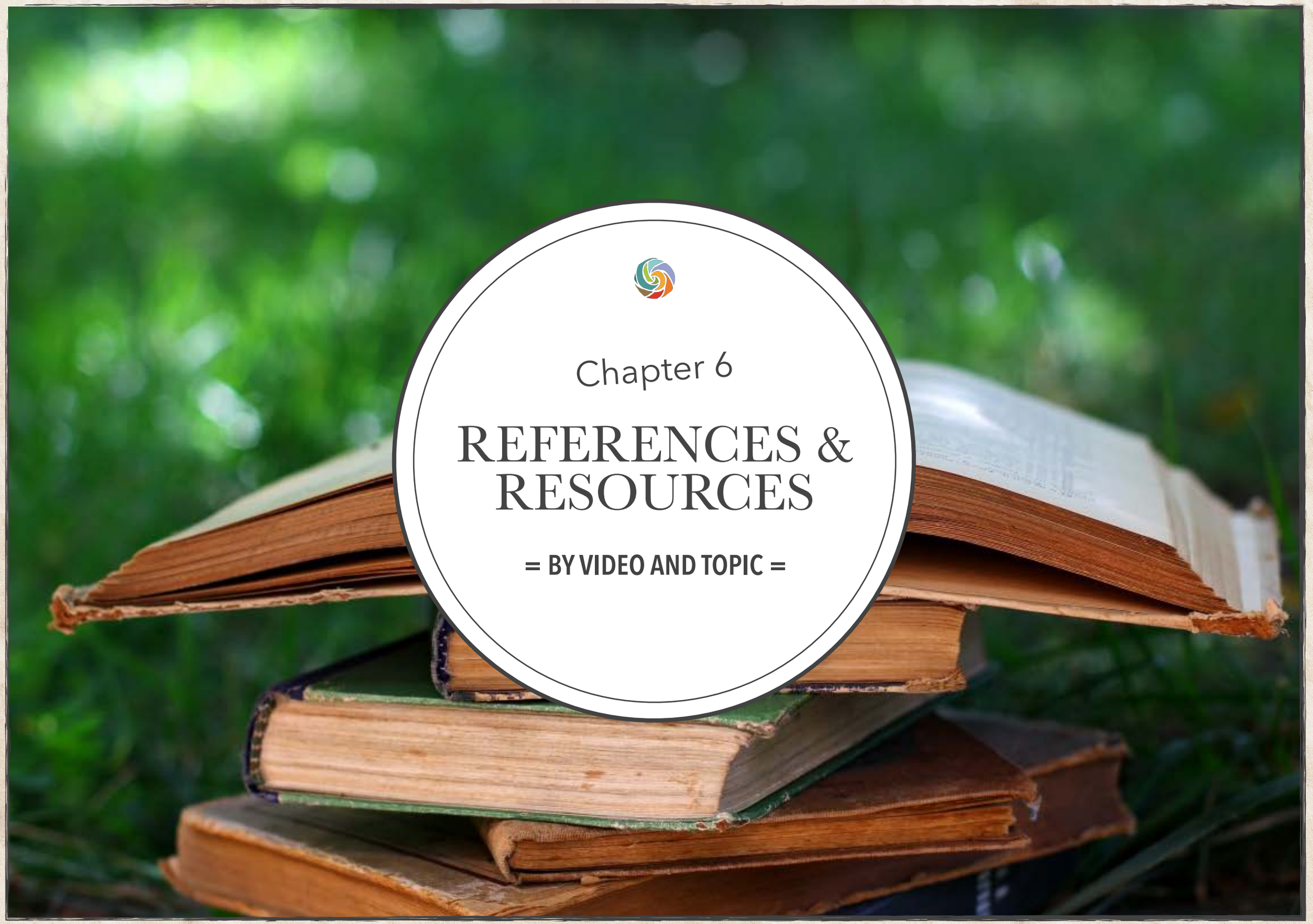
Therefore, the student is able to:

A. Evaluate how perceptions vary and affect people's views of contemporary issues and strategies for addressing them, as exemplified by being able to

- Explain how and why residents of different regions of the country might evaluate energy policy proposals differently (e.g., Alaska and Arctic National Wildlife Refuge [ANWR] oil drilling, California and off-shore oil production, mid-Atlantic states and the Marcellus Oil Shale Field).

- Explain how perceptions of immigration differ among people depending on their location, socioeconomic status, or occupation.

- Identify and compare different perspectives about international climate change agreements regarding carbon emissions from the points of view of the developed countries and the less-developed countries.



Chapter 6

REFERENCES & RESOURCES

= BY VIDEO AND TOPIC =

Section 1

CHIEF ALMIR

"Amazonian tribe use Google Earth to battle illegal logging" — Wired UK
http://www.wired.co.uk/news/archive/2012-06/18/amazon-tribe-google-earth

"Brazilian tribal chief uses technology to help save his people, and curb deforestation" — The Washington Post
http://www.washingtonpost.com/world/the_americas/brazilian-chief-uses-technology-to-help-save-his-tribe-and-curb-deforestation/2013/03/26/097b9338-84e7-11e2-a80b-3edc779b676f_story.html

"Can Google Earth save an indigenous tribe with maps?" — Scientific American[5]
http://blogs.scientificamerican.com/observations/can-google-earth-save-an-indigenous-tribe-with-maps/

"Chief Almir and the Surui tribe of the Amazon" — Google Earth Outreach[6]
http://www.google.com/earth/outreach/stories/surui.html

"From the Stone Age to the Digital Age in One Big Leap" — NPR[4] http://www.npr.org/2013/03/28/175580980/from-the-stone-age-to-the-digital-age-in-one-big-leap

"How an Amazon Tribe Used Google to Save Their Land" — Reader's Digest http://www.rd.com/true-stories/inspiring/how-an-amazon-tribe-used-google-to-save-their-land/

"How Google Earth Is Preserving, Sharing Indigenous Culture" — Mashable http://mashable.com/2012/06/25/google-earth-surui-cultural-map/

"Leaders of the Paiter Surui ask that the carbon project with Natura be terminated" — REDD Monitor http://www.redd-monitor.org/2015/01/13/leaders-of-the-paiter-surui-ask-that-the-carbon-project-with-natura-be-terminated/

"Metareilá Association/Surui Forest, Amazon" — Code REDD+[7] http://www.coderedd.org/redd-project-devs/metareila-association-surui-forest/

Chief Almir

"Paiter Surui" — paiter.org http://www.paiter.org/?lang=en_us

"Rain Forest Rebel" — Smithsonian Magazine http://www.smithsonianmag.com/people-places/rain-forest-rebel-147964944/?no-ist

"Response from the Metareilá Association to Surui leaders' call to stop the forest carbon project: 'A deplorable smear campaign'" — REDD Monitor[7] http://www.redd-monitor.org/2015/03/03/response-from-the-metareila-association-to-surui-leaders-call-to-stop-the-forest-carbon-project-a-deplorable-smear-campaign/

"Rondônia" — brazil.org.za http://www.brazil.org.za/rondonia.html

"The State of Rondônia in Western Brazil" — NASA's Earth Observatory http://earthobservatory.nasa.gov/Features/WorldOfChange/deforestation.php

"Surui" — IC Magazine (A Publication of the Center for World Indigenous Studies) https://intercontinentalcry.org/indigenous-peoples/surui/

"The Surui Cultural Map" — Google Official Blog[6] http://googleblog.blogspot.com/2012/06/surui-cultural-map.html

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"19th Century Perceptions" — Library of Congress[10] http://www.loc.gov/teachers/classroommaterials/presentationsandactivities/presentations/immigration/native_american4.html

Act of June 2, 1924" — National Archives[10] http://www.archives.gov/historical-docs/todays-doc/?dod-date=602

"Corn: Acreage by Year, US" — US Department of Agriculture's National Agricultural Statistics Service http://www.nass.usda.gov/Charts_and_Maps/Field_Crops/cornac.asp

"Corn Belt Pollution: Louisiana Shrimp and Oysters Pay the Price" — National Geographic http://voices.nationalgeographic.com/2014/10/21/corn-belt-pollution-louisiana-shrimp-and-oysters-pay-the-price/

"Corn farming the midwest heavily races water resources and supply" — The Guardian[12] http://www.theguardian.com/sustainable-business/2014/jun/23/corn-farming-midwest-water-pollution-nitrates-scarcity

"Earth was a frozen Snowball when animals first evolved" — BBC[8] http://www.bbc.com/earth/story/20150112-did-snowball-earth-make-animals

"Genetically engineered crops in nearly 12% of fields" — USA Today http://www.usatoday.com/story/news/nation/2014/02/13/gmos-2013-plantings-up-to-117-worldwide/5430617/

"How the Hopi Indians Reached Their World" — indians.org http://www.indians.org/welker/howtheho.htm

"Increased ethanol production to worsen Gulf of Mexico 'dead zone'" — University of Wisconsin-Madison http://www.news.wisc.edu/14875

John Mohawk

"It's Time to Rethink America's Corn System" — Scientific American, originally on ensia.com http://www.scientificamerican.com/article/time-to-rethink-corn/

"Major Crops Grown in the United States" — EPA (Environmental Protection Agency) http://www.epa.gov/oecaagct/ag101/cropmajor.html

Monsanto Homepage[13] http://www.monsanto.com

"Monsanto" — SourceWatch[13] http://www.sourcewatch.org/index.php/Monsanto

National Corn Growers Association 2013[11] http://www.ncga.com/upload/files/documents/pdf/WOC%202013.pdf

"Native American Rights" — thefreedictionary.com/West's Encyclopedia of American Law, edition 2 http://legal-dictionary.thefreedictionary.com/Native+American+Rights

"Native American Voters" — Library of Congress http://www.loc.gov/teachers/classroommaterials/presentationsandactivities/presentations/elections/voters9.html

"Northern Gulf of Mexico Hypoxic Zone" — EPA http://water.epa.gov/type/watersheds/named/msbasin/zone.cfm

"'Snowball Earth' Confirmed: Ice Covered Equator" — National Geographic[8] http://news.nationalgeographic.com/news/2010/03/100304-snowball-earth-ice-global-warming/

"Thomas Banyacya, 89, Teller of Hopi Prophecy to World" — New York Times[9] http://www.nytimes.com/1999/02/15/us/thomas-banyacya-89-teller-of-hopi-prophecy-to-world.html

"Water & Climate Risks Facing U.S. Corn Production" — Ceres[12] http://www.ceres.org/issues/water/agriculture/the-cost-of-corn

Section 3

INDIGENOUS ESSENTIALS

"Adoption of Declaration on Rights of Indigenous Peoples a historic moment for human right, UN Expert says" — United Nations Office of the High Commissioner for Human Rights http://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=1721&LangID=E

"An Interview with Anthropologist Wade Davis" — NPR[3] http://www.npr.org/programs/re/archivesdate/2003/may/mali/davisinterview.html

Center for World Indigenous Studies Homepage http://cwis.org

Cultural Survival Homepage http://www.culturalsurvival.org

"Definitions of Traditional Knowledge" — National Aboriginal Forestry Association http://nafaforestry.org/forest_home/documents/TKdefs-FH-19dec06.pdf

"Dictionary.com Unabridged" — Random House, Inc. http://dictionary.reference.com/browse/

"Ecology Dictionary" — EPA http://www.ecologydictionary.org/EPA-Terms-of-Environment-Dictionary/

"General Assembly Adopts Declaration on Rights of Indigenous Peoples; 'Major Step Forward' Towards Human Rights for All, Says President" — United Nations http://www.un.org/press/en/2007/ga10612.doc.htm

"High Commissioner for Human Rights Hails Adoption of Declaration on Indigenous Rights" — UN Office of the High Commissioner for Human Rights http://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=6097&LangID=E

"Human Planet Explorer" — BBC http://www.bbc.co.uk/nature/humanplanetexplorer/

Topic: Indigenous Essentials

Indigenous Environmental Network Homepage www.ienearth.org

"Indigenous Knowledge" — Bioneers http://www.bioneers.org/indigeneity-program/

"Indigenous Knowledge, Peoples and Sustainable Practice" — Douglas Nakashima & Marie Roué from unesco.org http://portal.unesco.org/science/en/files/3519/10849731741IK_People/IK_People

"Last Words: The Dying of Languages" — WorldWatch Institute[2] http://www.worldwatch.org/node/500

"Problems with Integrating Traditional Ecological Knowledge into Contemporary Resource Management" — Food and Agriculture Organization of the United Nations http://www.fao.org/docrep/ARTICLE/WFC/XII/0887-A3.HTM

"Recognizing the Value of Indigenous Knowledge for Sustainable Development" — UNESCO http://www.unesco.org/new/en/media-services/single-view/news/recognizing_the_value_of_indigenous_knowledge_for_sustainable_development/#.VaMyNesqnU0

The Rosetta Project Homepage http://rosettaproject.org

Society for Ecological Restoration's "Indigenous Peoples' Restoration Network" Homepage http://www.ser.org/iprn/iprn-home

"Western science and traditional knowledge: Despite their variations, different forms of knowledge can learn from each other" — EMBO Reports from National Institute of Health http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1479546/

"What Is an Endangered Language?" — Linguistic Society of America http://www.linguisticsociety.org/content/what-endangered-language

Topic: Indigenous Essentials

"What Is Indigenous Knowledge?" — World Bank Group http://www.worldbank.org/afr/ik/basic.htm

"What Is Traditional Knowledge?" — NativeScience.org http://www.nativescience.org/html/traditional_knowledge.html

"Who Are Indigenous Peoples?" — United Nations[1] http://www.un.org/esa/socdev/unpfii/documents/5session_factsheet1.pdf

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ADAPTATION

n., any alteration in the structure or function of an organism or any of its parts that results from natural selection and by which the organism becomes better fitted to survive and multiply in its environment; also, the ability of a species to survive in a particular ecological niche, especially because of alterations of form or behavior brought about through natural selection

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CARBON CREDIT

n., a permit that gives a company, country, etc. the right to emit a specified amount of carbon compounds in to the atmosphere, and may be purchased if emissions are expected to exceed a quota or sold if the quota is not reached: companies can accumulate carbon credits by funding new forest growth

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CARBON OFFSETTING

n., a program in which a company, country, etc. reduces or offsets its carbon emissions through the funding of activities and projects that improve the environment

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CLIMATE CHANGE

n., because the earth's climate is never static, the term is properly used to imply a significant change from one climatic condition to another and often used synonymously with "global warming." Scientists can use "climate change" in the wider sense to also include natural changes in climate.

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DOMESTICATE

v., to adapt (a plant) so as to be cultivated by and beneficial to human beings

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ECOSYSTEM

n., a system, or a group of interconnected elements, formed by the interaction of a community of organisms with their environment

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HOPI

a member of a North American Indian people of northern Arizona

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HOUSE OF MICA

the term used in a Hopi prophecy representing the United Nations

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INDIGENOUS

adj., originating in and characteristic of a particular region or country; native

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MAYA

n., a member of a modern American Indian people of southern Mexico, Guatemala, and parts of Honduras who are the descendants of this ancient civilization

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NICCOLO MACHIAVELLI

1469-1527, Italian statesman, political philosopher, and author of Il Principe, in which political expediency is placed above morality and the use of craft and deceit to maintain the authority and carry out the policies of a ruler is described

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RESERVE

(e.g. the Surui's 7th of September): n., a tract of public land set apart for a special purpose

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RONDÔNIA

A state in northwest Brazil with Porto Velho as its capital and timber as its main export as it is largely covered by the Amazon Rainforest

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SENECA

n., the largest tribe of the Iroquois Confederacy of North American Indians, formerly inhabiting western New York and being conspicuous in the wars south and west of Lake Erie

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SIX NATIONS

n., the Indian confederacy of the Cayugas, Mohawks, Oneidas, Onondagas, Senecas, and Tuscaroras; also called Iroquois

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SNOWBALL EARTH

a global deep freeze that started ~715 million years ago, lasted ~120 million years, and likely contributed to the Cambrian explosion[8]

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SUSTAINABILITY

n., the quality of not being harmful to the environment or depleting natural resources, and thereby supporting long-term ecological balance

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THOMAS BANYACYA

1909-1999, Hopi elder, messenger, and interpreter of Hopi prophecies who took his “message of peace” to the United Nations[9]

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