Facing the Future Publications   Facing the Future Curriculum

2008

Understanding Sustainability: A Social Studies Curriculum, Recommended for Grades 9 - 12

Facing the Future, Western Washington University

Understanding Sustainability

A Social Studies Curriculum

Recommended for Grades 9-12

2-Week Curriculum Unit

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UNDERSTANDING SUSTAINABILITY:
Two-Week Unit for Social Studies
Grades 9-12

Understanding Sustainability

Two-Week Unit for Social Studies
(Grades 9-12)

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Acknowledgements

Understanding Sustainability
Introduction

Sustainability is a complex, interdisciplinary topic of study. While the notion of sustainability is not a new concept, the word itself has been growing in popular use. Issues of sustainability are receiving worldwide attention as people strive to address problems such as the rich-poor gap, climate change, and overconsumption of natural resources.

So what is sustainability, anyway? Sustainability refers to meeting current needs without limiting the ability of future generations to meet their needs. Working toward sustainability requires fostering the well-being of our economies, societies, and natural environment.

This unit of study encourages students to explore a variety of topics related to global sustainability. Students will develop an understanding of important sustainability concepts and their interconnections, such as resource consumption, human population growth, and poverty and social equity. They will investigate historic examples of civilizations that failed to respond to gathering threats to the survival of their economies, societies, and natural environments. Drawing on the lessons of past civilization collapses, students will consider how to create a sustainable future for people in today's local and global communities, taking into account both personal and structural solutions to current challenges. At the close of the unit, students will envision and design a sustainable future for themselves and others.

The curriculum unit includes lessons, readings, homework assignments, assessments, action project ideas, and other resources for an in-depth introduction to global sustainability. Each lesson is designed as a stand-alone lesson.
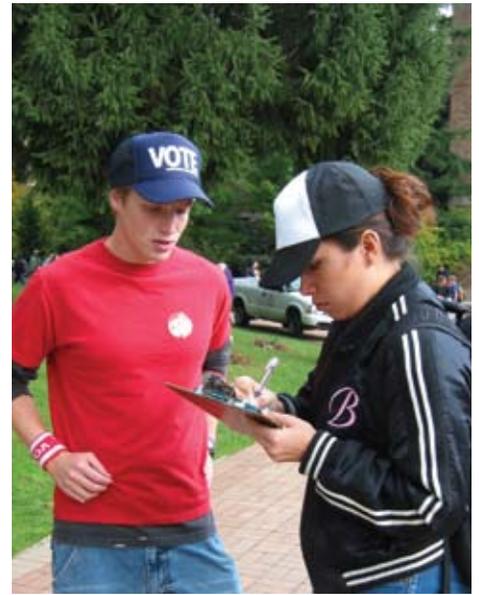
Classes: Contemporary World Problems, World History, Economics, Geography

Grade Level: 9-12

Unit Length: 2 weeks

Key Concepts Covered:

- Action planning
- Civic engagement
- Community planning
- Consumerism
- Ecological footprint
- Equity
- Governance
- Media
- Personal solutions
- Policy
- Population
- Poverty
- Quality of life
- Resource consumption
- Structural solutions
- Sustainable civilizations

Student Skills Developed:

- Collaboration
- Critical thinking
- Historical analysis
- Inquiry
- Mapping
- Problem-solving
- Systems thinking
- Written and oral communication

National Council for the Social Studies (NCSS) Standards and Performance Expectations for High School Addressed:

   I. Culture

  II. Time, Continuity, and Change

 III. People, Places, and Environments

 IV. Individual Development and Identity

  V. Individuals, Groups, and Institutions

 VI. Power, Authority, and Governance

VII. Production, Distribution, and Consumption

VIII. Science, Technology and Society

 IX. Global Connections

  X. Civic Ideals and Practices

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	Day 1	Day 2	Day 3	Day 4	Day 5	
in class	Watch Where You Step	Is It Sustainable?	Shop Till You Drop?	Are You Buying This?		
suggested homework	Student Reading **1** Ecological Footprint	Student Reading **2** Feeding the World	Resource Use Analysis			

	Day 6	Day 7	Day 8	Day 9	Day 10	
in class	What Makes a Civilization Sustainable?	Putting Our Community on the Map		Three Faces of Governance	Creating Our Future	
suggested homework	Student Reading **3** Urban and Community Planning	Neighborhood Resource Inventory		Student Reading **4** What Is Good Governance?		

Watch Where You Step

Students identify the components of an ecological footprint by creating a web diagram of all the resources they use in their everyday lives and the mark or "footprint" this consumption leaves on the environment. The activity emphasizes the interconnectedness of lifestyle, population, and environmental impacts, and focuses on solutions to reduce ecological footprints. Extension activities ask students to research past trends in ecological footprint size and to compare footprints from around the world.

Key Concepts

- Ecological footprint
- Population
- Consumption
- Sustainability

Integrated Subject Areas

- Science (Biology, Environmental)

Inquiry/Critical Thinking Questions

- What are the environmental, economic, and social impacts of a typical American diet and lifestyle?
- What would be the consequences if the rest of the world adopted a typical American lifestyle?
- What can we do to reduce negative social, environmental, and economic impacts associated with resource consumption?

Objectives

Students will:

- Identify the resources, processes, and impacts associated with everyday activities
- Describe the interconnectedness of population, lifestyle, economics, and environmental issues
- Discuss, create, and implement ways to reduce ecological footprints

NCSS Standards and Performance Expectations for High School Addressed

- II.f. apply ideas, theories, and modes of historical inquiry to analyze historical and contemporary developments, and to inform and evaluate actions concerning public policy issues
- III.e. describe, differentiate, and explain the relationships among various regional and global patterns of geographic phenomena such as landforms, soils, climate, vegetation, natural resources, and population
- III.h. examine, interpret, and analyze physical and cultural patterns and their interactions, such as land use, settlement patternwwltural transmission of customs and ideas, and ecosystem changes
- III.k. propose, compare, and evaluate alternative policies for the use of land and other resources in communities, regions, nations, and the world
- VII.j. apply knowledge of production, distribution, and consumption in the analysis of a public issue such as the allocation of health care or the consumption of energy, and devise an economic plan for accom-

plishing a socially desirable outcome related to that issue

- VIII.a. identify and describe both current and historical examples of the interaction and interdependence of science, technology, and society in a variety of cultural settings

- VIII.b. make judgments about how science and technology have transformed the physical world and human society and our understanding of time, space, place, and human-environment interactions

- IX.d. analyze the causes, consequences, and possible solutions to persistent, contemporary, and emerging global issues, such as health, security, resources allocation, economic development, and environmental quality

- IX.h. illustrate how individual behaviors and decisions connect with global systems

Materials/Preparation

- Index cards, 1 per student pair
- Butcher paper, 1 sheet per group of 3-4 students
- Colored marking pens, 2-3 pens per group of 3-4 students
- Overhead: *Definition and Components of an Ecological Footprint*
- (Optional) Handout: *Hamburger, Fries, and a Cola*

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Activity
Introduction

1. Write the word "sustainability" on the board. Ask the class to think quietly about the meaning of this word for 1 minute. (Hint: What does it mean "to sustain"?) Then have students pair up with a partner and discuss what they think sustainability means. Instruct each pair to write their definition on an index card. Collect the cards and read aloud students' proposed definitions of the word. Construct a definition of sustainability that the class can agree on. (Ideally the class's definition will express the following idea in students' own words: Sustainability means meeting present needs without compromising the ability of future generations to meet their own needs.) Tell them that the activity they are about to begin is directly related to global sustainability.

2. Introduce the concept of ecological footprint using the overhead, *Definition and Components of an Ecological Footprint*. Tell students that in order to understand this concept they will create a web diagram illustrating everything associated with 1 component of their ecological footprint.

Steps

1. Give the following directions before grouping students and assigning their footprint component: In groups, brainstorm and map all the resources, processes, and impacts associated with 1 component of your ecological footprint, such as a meal,

understanding sustainability

Item/Component	What is it made of?	What resources are needed?	Is transportation required?	What are possible environmental, social, and economic impacts of this item?

mode of transport, favorite object, or item of clothing. For example, for "An Item of Food," you would first agree on a meal you like, write and/or draw it in the center of the paper, and then write and/or draw the resources and processes required to produce it.

Note: There is no single "right" way to do this activity. A simple web diagram could include lines or arrows connecting the various components of an item to all of the related inputs and impacts. Students may be able to think of many possible inputs and outputs related to their chosen item. This activity could also be expanded to include student research on the materials required to produce a given item and how the production of those materials affects the lives of people in various places.

2. Do a short verbal example together with the class.

   • Ask them what it takes to create a hamburger (cow, bun, lettuce, etc.).

   • Now, think about all the steps required to make a hamburger, including the resources used to produce, process, deliver, serve, and dispose of it (e.g., farmland, water, farm machinery, fertilizer, pesticides, petroleum fuels, electrical energy, transportation, refrigeration, markets, and restaurants). What impacts result from each of those processes and technologies

(e.g., soil erosion, pesticide runoff, air pollution, freeway crowding, and urban sprawl)?

   • Finally, consider additional impacts that have not yet been shared. What are some impacts of hamburger consumption on people and societies, including people involved in producing it and people who consume it?

   • Use the optional handout, *Hamburger, Fries, and a Cola*, as an example of what goes into producing this common American meal.

3. Arrange students in groups of 3-4.

4. Assign each group 1 item from the list above in order to illustrate components of an ecological footprint, and have groups begin their web diagrams. (If you have a large class, you can assign items to more than 1 group.)

   • An item of food

   • A mode of transportation

   • An object (a book, sports equipment, etc.)

   • A piece of clothing

5. If students need help organizing their thoughts, you may want to create a chart on the board like the example on this page to get them started.

6. Allow about 20 minutes for this portion of the activity. Encourage students to be

creative and think of everything that is related to the object. Remind them to include items such as transportation of a product, the marketing of popular brand items, health issues, and waste disposal.

7. After completing their diagrams, have students brainstorm and list on their butcher paper 10 things that they can do personally to reduce their ecological footprint (in relation to the item they mapped).

8. Have each group present their diagrams and report their findings and solutions to the class. As students present their footprint reduction solutions, be sure to emphasize that they do not need to give up everything they like, but rather should focus on ways to reduce their impacts. For example, instead of saying that people should never drive cars, they could say that people could ride a bike to school when possible, or once a week.

9. Bring the class back together for reflection questions.

Assessment
Reflection

1. Imagine constructing the ecological footprint of your item 100 years ago. How would the size of your item's footprint be different? Why?

2. If only a small percentage of the world's people were able to enjoy such a meal, mode of transportation, or clothing while the rest of the world did without, what might the environmental, social, and security consequences be?

3. What would be the consequences of 12 billion people having the same lifestyle as U.S. citizens? Would that be sustainable? How might your life change in response? How might that impact your access to education, employment, and recreation?

4. Does lessening our impacts necessarily mean reducing our quality of life? Why, or why not?

5. How could you maintain a comfortable and fulfilling lifestyle, but lower your lifestyle's negative environmental and social impacts?

Homework

Read Student Reading 1, *Ecological Footprint*.

History Connection

Have students research how ecological footprint size has changed throughout history, either in the U.S. or in other countries, by finding evidence of past and present lifestyles and consumption patterns. How has our ecological footprint changed over time? What might be causing this trend?

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Geography Connection

Students can calculate the size of their own ecological footprint and compare it with people around the world by visiting **www.myfootprint.org**. Additional research on the components of ecological footprints in different countries can be done using WWF's Living Planet Report (www.panda.org/livingplanet). Ask students to outline the main factors they think will affect the country's footprint in the future (for example, population growth, industrialization, or consumption) and some recommendations for limiting future footprint growth.

Action Project

Do an Ecological Footprint Awareness Campaign. Have the students post their footprint diagrams around the school with titles such as, "This Is What It Takes to Bring You Your Lunch" or "Have You Ever Wondered What Resources It Takes to Get You to School Every Day?"

Additional Resources
Books

*   *Stuff: The Secret Lives of Everyday Things,* John C. Ryan and Alan Thein Durning, Northwest Environment Watch (now the Sightline Institute), 1997. *Stuff* reveals the resources required to produce things that a typical middle class North American consumes everyday. www.sightline.org/publications/books/stuff/stuff

*   *Material World: A Global Family Portrait,* Peter Menzel, Sierra Club Books, 1994. Award-winning photojournalist Peter Menzel brought together 16 of the world's leading photographers to create a visual portrait of life in 30 nations.

Websites

*   **www.redefiningprogress.org** – Redefining Progress works with a broad array of partners to shift the economy and public policy towards sustainability.

*   **www.footprintnetwork.org** – The Global Footprint Network supports a sustainable economy by advancing the ecological footprint, a measurement and management tool that makes the reality of planetary limits relevant to decision-makers around the world.

*   **www.worldwatch.org/taxonomy/term/44** – *Good Stuff?: A Behind-the-Scenes Guide to the Things We Buy* is an online publication from the Worldwatch Institute. It provides information about the social and environmental impacts generated by everyday items, from soap to cell phones.

*   **www.ibuydifferent.org/** – The Be, Live, Buy Different—Make a Difference campaign, a partnership of the Center for a New American Dream and WWF, provides "life stories" for common items such as a hamburger and a light bulb.

DEFINITION AND COMPONENTS OF AN ECOLOGICAL FOOTPRINT

Ecological Footprint:

The area of the earth's productive surface (land and sea) that it takes to produce the goods and services necessary to support a person's or a population's lifestyle.

Components of an Ecological Footprint:

Oxygen (trees for absorbing carbon dioxide)

Food (e.g., meat, dairy, fish, fruits and veggies)

Water (e.g., drinking, cooking, washing)

Fiber (e.g., clothes, wood, upholstery)

Energy (e.g., fuel for cars, heat for cooking)

Infrastructure (e.g., highways, hospitals, water facilities)

Waste Disposal (garbage dumps, landfills)

Recreation (e.g., soccer fields, parks)

What Did It Take to Produce This American Meal?

The meat came from cattle grazed initially on public or private land, and later fed grain. About ten percent of all public lands in the western United States have been turned to desert by overgrazing, and about two-thirds of those public lands are significantly degraded. Streamside lands where cattle graze have been especially damaged.

It took approximately 2 pounds of grain to produce that quarter pound of meat, and that grain production caused five times its weight in topsoil loss due to erosion from unsustainable farming methods. Producing that grain also took substantial amounts of pesticides and fertilizers (half of all fertilizer in the United States is applied to feed corn for animals), some of which ran off into surface water or seeped into groundwater supplies. By the time the steer was finished in the feedlot, it took 600 gallons of water to build that hamburger patty. Once slaughtered and processed, the meat was frozen, shipped by truck, kept cold, and then cooked on a grill using natural gas.

The 5-ounce order of fries came from one 10-ounce potato grown in Idaho on half a square foot of soil. It took 7.5 gallons of water to raise that potato, plus quantities of fertilizer and pesticides, some of which ran off into the Columbia or Snake Rivers. Because of that, and dams that generate power and divert water for irrigation, the Snake River sockeye salmon is virtually extinct. A number of other species are also in decline because of these production practices.

The potato was dug with a diesel-powered harvester and then trucked to a processing plant where it was dehydrated, sliced, and frozen. The freezing was done by a cooling unit containing hydro fluorocarbons (HFCs), some of which escaped into the atmosphere and likely contributed to global climate change. The frozen fries were then trucked to a distribution center, then on to a fast food restaurant where they were stored in a freezer and then fried in corn oil heated by electricity generated by hydropower.

The meal was served in a fast food restaurant built on land that was originally forest, then farmland, and then converted to commercial/industrial uses as the city expanded. The ketchup in aluminum foil packets came from Pittsburgh and was made from Florida tomatoes. The salt came from Louisiana.

The cola came from a Seattle processing plant. It is made of 90 percent water from the Cedar River. The high-fructose corn syrup came from Iowa, as did the carbon dioxide used to produce the fizz, which is produced by fermenting corn. The caffeine came from a processing plant that makes decaffeinated coffee. The cola can was made from one-third recycled aluminum and two-thirds bauxite ore strip-mined in Australia. It came to Washington State on a Korean freighter, and was processed into aluminum using an amount of energy equivalent to a quart of gasoline. The energy came from some of the same dams mentioned earlier that have contributed to a 97 percent decrease in the salmon runs of the Columbia Basin.

The typical mouthful of food consumed in the United States travels a total of 1,200 miles. Along the way, it requires packaging, energy, roads, bridges, and warehouses, and contributes to atmospheric pollution, adverse health effects, and traffic congestion.

Adapted from Stuff: The Secret Lives of Everyday Things, by John C. Ryan and Alan Thein Durning, Northwest Environment Watch (now the Sightline Institute), 1997.

Is It Sustainable?

Students define and discuss sustainability and its 3 key components: the economy, the environment, and society. They evaluate 2 seemingly identical apples through the lens of sustainability. Students then brainstorm and analyze the sustainability of a variety of actions taken by individuals, businesses, and governments, using a Venn diagram to help organize the process. A homework assignment calls for students to evaluate the sustainability of resources they use on a daily basis.

Key Concepts

- Sustainability
- 3 components of sustainability: economy, environment, and society

Integrated Subject Areas

- Science (Environmental, Biology)

Inquiry/Critical Thinking Questions

- What does "sustainability" mean and how does it apply to human activity?
- How is the sustainability of an individual, business, or government activity determined?
- How can we balance the needs of people, protect the environment, and have a vibrant and equitable economy?
- How can an activity be made more sustainable?

Objectives

Students will:
- Define sustainability and its three key components: the economy, the environment, and society
- Identify and describe a range of activities undertaken by individuals, business-

es, and governments (e.g., foods eaten, transportation used, products bought, services provided, laws passed)
- Determine the sustainability of these activities based on a set of criteria that includes impacts on the economy, the environment, and society
- Present their findings using a Venn diagram
- Analyze if and how an unsustainable activity can be altered to adhere to the three components of sustainability

NCSS Standards and Performance Expectations for High School Addressed

- I.f. interpret patterns of behavior reflecting values and attitudes that contribute or pose obstacles to cross-cultural understanding
- III.h. examine, interpret, and analyze physical and cultural patterns and their interactions, such as land use, settlement patterns, cultural transmission of customs and ideas, and ecosystem changes
- V.g. analyze the extent to which groups and institutions meet individual needs and promote the common good in contemporary and historical settings

- VII.c. consider the costs and benefits to society of allocating goods and services through private and public sectors

- VII.j. apply knowledge of production, distribution, and consumption in the analysis of a public issue such as the allocation of health care or the consumption of energy, and devise an economic plan for accomplishing a socially desirable outcome related to that issue

- VIII.b. make judgments about how science and technology have transformed the physical world and human society and our understanding of time, space, place, and human-environment interactions

- IX.d. analyze the causes, consequences, and possible solutions to persistent, contemporary, and emerging global issues, such as health, security, resource allocation, economic development, and environmental quality

- IX.h. illustrate how individual behaviors and decisions connect with global systems

- X.c. locate, access, analyze, organize, synthesize, evaluate, and apply information about selected public issues—identifying, describing, and evaluating multiple points of view

Vocabulary

- **economy** – A system that includes the production, distribution, and consumption of goods and services.

- **environment** – The physical surroundings, including living and nonliving factors, in which we live.

- **society** – A community, nation, or other group of people who have common interests, institutions, or culture.

- **sustainability** – Meeting our own needs without limiting the ability of future generations to meet their needs.

Materials/Preparation

- 2 apples (or tomatoes or other locally available produce): 1 organic from a different state or country and 1 conventionally grown in-state

- Overhead: *Components of Sustainability*

- 3 different colored 2"x2" sticky notes, enough for each student to have 1 sticky note of each color

- Draw a Venn diagram (like the one in the *Components of Sustainability* overhead) on a large sheet of butcher paper (or project the overhead onto a whiteboard)

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Activity
Introduction

1. Review the definition of sustainability with students.

2. Show the class the 2 apples, but do not reveal anything about them. (Apple 1 is the organic, non-local apple. Apple 2 is the conventional, locally grown apple.) In a class discussion format, ask students which apple they think was produced in the most sustainable manner and why. (At this point, they are only guessing based on each apple's appearance.) Also, what information would change their minds? Alternatively, you could ask students to write their answers down rather than express them verbally.

3. Reveal the following pieces of information, one category at a time. After each "reveal," ask students which apple is most sustainable and why. There is no right or wrong answer as to which apple is most sustainable—for example, Apple 1 is grown with no pesticides, but Apple 2 requires less fuel for transportation.

4. Students will likely change their minds at least once about which apple they believe to be most sustainable. Ask them what

	Apple 1 (Organic, Non-Local)	Apple 2 (Conventional, Local)
Price to consumer	$1.00	$0.50
Amount of money received by farmer	$0.50	$0.25
Miles traveled (from farm to grocery store)	1000	200
Pesticides used	none	insecticides to kill insect pests (side effects include damage to aquatic invertebrates, pollinator insects, farm workers' health, and groundwater quality)
Impact of production on soil health*	good soil quality	poor soil quality
Taste	slightly sweet	slightly tart

*Soil quality is defined as "the capacity of a soil to sustain biological productivity, maintain environmental quality and promote plant and animal health." J.P. Reganold et al., "Sustainability of three apple production systems," in *Nature*, April 2001.

piece of information was most helpful in informing them about the sustainability of the apples. Do they think people should be given more information to help them make more informed decisions about what to consume? Why or why not? If they do think more information should be provided, who should provide that information and where? (At supermarkets? In the news? At school?)

5. (Optional) Allow students to taste samples of each apple.

Steps

1. Define the 3 components of sustainability using the overhead, *Components of Sustainability*. Explain that in determining whether an action or product/service is sustainable, many people who study sustainability take into account 3 key elements: the environment, the economy, and society/equity. In order to determine whether or not something is sustainable, the activity being evaluated would be assessed in relation to each of these principles, or "standards of sustainability." This assessment reveals how the action or item impacts the economy, the environment, and society in either

negative, positive, or neutral ways. You may need to define "economy," "environment," and "society."

2. Using the Venn diagram (on the butcher paper or projected on the whiteboard), explain that its purpose is to demonstrate that issues overlap and share common traits.

3. Explain that they will list and analyze the sustainability of several different activities, products, and actions from the following categories: **individual activities** (e.g., eating breakfast, driving to school, attending school, playing guitar), **business products and services** (e.g., clothes, housing, computers, restaurants), or **government actions** (e.g., passing laws and regulations such as speed limits and burn bans, provision of services such as utilities and trash).

4. Before breaking the class into groups, choose 1 activity/item (such as riding the bus to school) and walk through an analysis of the activity with the whole class, asking if it is sustainable using the 3 components of sustainability (economy, environment, and society) as a guide. Alternatively, you may want to walk through this analysis with one of the apples from the prior activity. Questions to ask about the activity include:

Environment:

- Does the activity/item use a minimal amount of resources? Are the resources renewable?

- Can the activity be done without damaging plants or animals?

- Does it contribute to air, water, and soil quality, rather than leading to pollution or erosion?

- Does it use resources at a rate that allows the resource to be renewed or regenerated?

- Is the waste created by the activity recycled or recyclable?

- Does the activity generate a limited amount of waste?

- Does this activity contribute to the conservation of natural resources?

Society:

- Does the activity/item contribute to people's quality of life?

- Does it positively affect culture(s)?

- Are individuals and communities involved in making decisions about the activity, and is the decision-making process fair and democratic?

- Is it an equitable activity (i.e., does it offer more options and opportunities to certain groups of people than others)?

Economy:

- Does the activity/item have a positive impact on either local or global economies?

- Does it create meaningful and satisfying work for individuals?

- Does it contribute to a community's economic development?

- Do all people receive equal economic benefits from the activity, rather than some people benefiting at the expense of others?

Overall Sustainability:

- Can the activity be done without causing damage in the 3 areas (economy, environment, and society)?

- Can this activity be done so that people in the future will have the same opportunities to do this activity as people today?

5. Arrange students in groups of 3 and assign each group 1 category: individual activities, business products and services, or government actions.

6. Have them create a brainstorm list of activities/items that fall within their assigned category. Be as specific and descriptive as possible during the brainstorm. For example, rather than list a cup of coffee, think about what kind of

coffee you want to analyze—is it shade-grown coffee or Fair Trade certified?

7. From their brainstorm list, have students choose 2 items from their list and transfer these to individual color-coded sticky notes (use different colored sticky notes for each category, such as blue for individual activities, yellow for business activities, and green for government activities).

8. Have students place their sticky notes on the Venn diagram in the area they think the activity best fits, depending on whether the activity is economically, environmentally, and/or socially sustainable. If an activity is both environmentally and economically sustainable, place the sticky note in the area of overlap between the environment and economy circles. If an activity is not sustainable in any of the 3 categories, place the sticky note outside the Venn diagram. Many actions are not inherently sustainable or unsustainable. For example, harvesting timber does not have to be an unsustainable action; it can be done in a manner that promotes ecosystem health and continued forest production.

9. Have each group explain to the class how they decided on the placement, giving concrete examples and evidence to support their decision. Encourage each member of the group to participate in the discussion, and answer questions from the class.

10. Conclude with the following reflection questions.

Assessment
Reflection

1. If someone asked you what sustainability meant, how would you respond?

2. In determining sustainability, is 1 aspect more important than the others? For example, do you think concerns about environment are more important than concerns about society or the economy?

3. Can everything we do be measured against the standards of sustainability? What are some examples of activities that would be especially difficult to measure and especially easy to measure?

4. Why do you think people use the standards of sustainability to assess human activities? How and where could this process be useful?

5. Whose needs should be met when there are trade-offs involved (e.g., between economic and environmental priorities)? How can these contradictions be resolved?

6. Choose an unsustainable activity from the Venn diagram and explain how it could be made more sustainable.

Homework

Read Student Reading 2, *Feeding the World*.

History Connection

Have students interview an older person in their family or community, collecting information about the ways in which food production and consumption has changed in his or her lifetime. Possible questions are: What kinds of foods did you eat when you were a child? Where did you get your food? How is dinnertime different now than when you were young?

Action Project

Participate in Heifer International's Chores for Change program. Heifer International works to end world hunger by providing impoverished families with livestock and extensive training in animal care, sustainable agriculture, and community development. Chores for Change challenges students to combat hunger in their own communities through service at soup kitchens and food banks. For more information about the Chores for Change program, visit **www.heifer.org.**

"In order to increase the sustainability of our food systems, we must consider how our choices affect people and the planet.
- Student Reading 2, page 89

Additional Resources
Films

- *Good Food*, Moving Images, 2008, 73 minutes, www.movingimages.org and www.bullfrogfilms.com. This documentary features organic farmers and ranchers, and the grocery stores and farmers markets where their food is sold. Viewers witness organic methods of production for a number of crops in the Pacific Northwest.

- *Ecological Design: Inventing the Future,* Brian Danitz and Chris Zelov, 1994, 60 minutes. What do flying bicycles, Rocky Mountain jungles, "living machines," and recyclable homes with their own "metabolism" all have in common? They are unique, inexpensive solutions to the design dilemma of sustainable living and are all featured in this film. http://www.filmwest.com/Catalogue/itemdetail/8/

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Components of
Sustainability

SOCIETY

ENVIRONMENT

ECONOMY

3
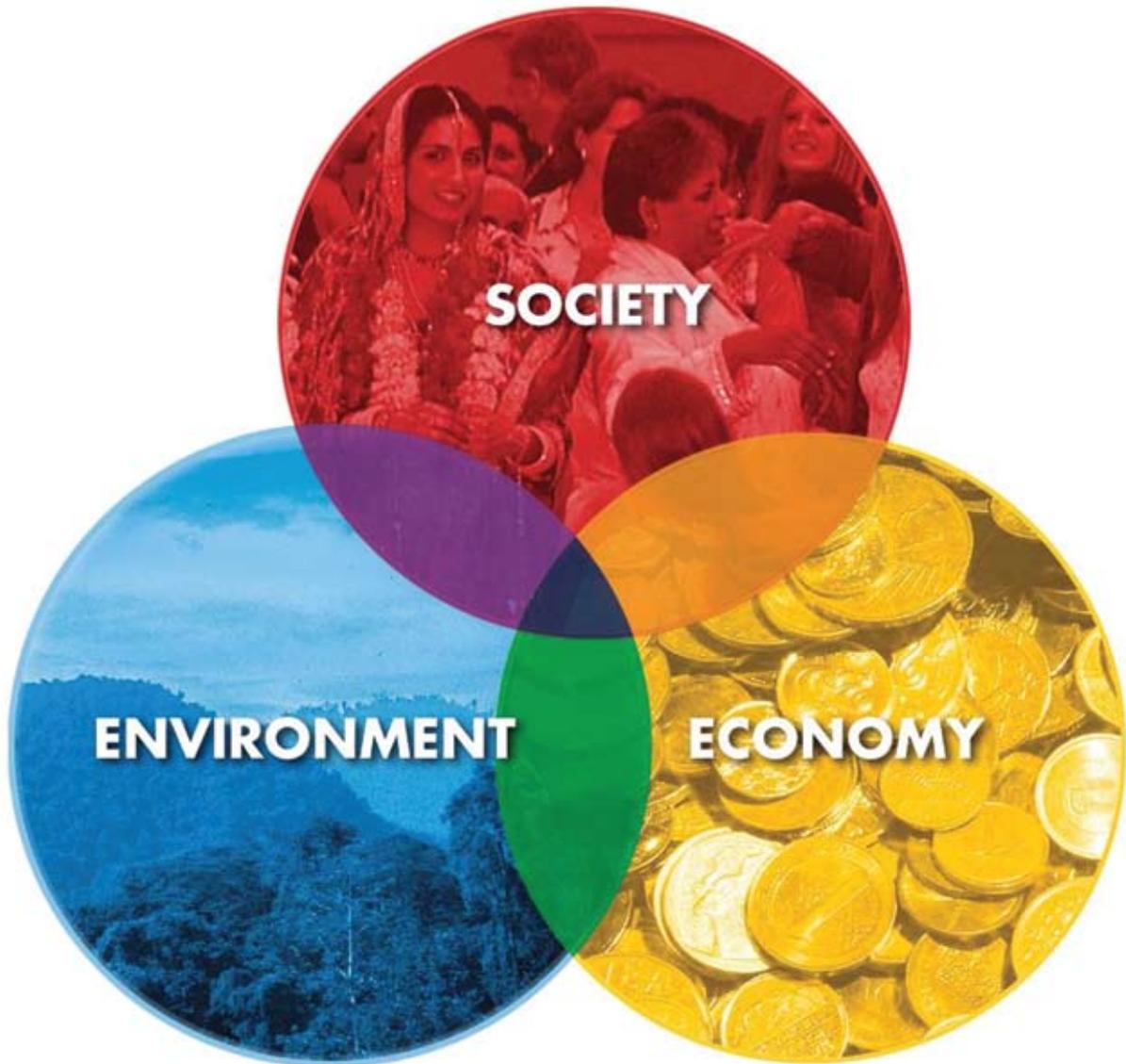
Shop Till You Drop?

In this simulation, students experience how resources are distributed and used by different people based on access to wealth, while paying attention to the environmental and social impacts of resource consumption. Students discuss and write about personal and structural solutions to increase the environmental and social sustainability of consumption choices. An extension activity focuses on real-world resource distribution per capita.

Key Concepts

- Equity, poverty, and scarcity
- Consumption patterns
- Environmental impacts

Integrated Subject Areas

- Science (Environmental, Life)
- Mathematics
- Health/Nutrition

Inquiry/Critical Thinking Questions

- What are the choices that people with relatively little access to wealth/income can make compared to people with relatively high access?
- What are the environmental and social impacts of each of those choices and decisions?
- What personal choices can we make to help reduce the negative impacts of our consumption?
- What actions can we take to help alleviate poverty?

Objectives

Students will:
- Make and explain purchasing/consumption choices
- Compare different purchasing/consumption choices and their social and environmental impacts
- Describe how relative affluence and high consumption levels relate to environmental degradation
- Discuss how socioeconomic status can limit choices
- Discuss and begin to implement personal choices to reduce the negative impacts of consumption

NCSS Standards and Performance Expectations for High School Addressed

- I.a. analyze and explain the ways groups, societies, and cultures address human needs and concerns
- III.h. examine, interpret, and analyze physical and cultural patterns and their interactions, such as land use, settlement patterns, cultural transmission of customs and ideas, and ecosystem changes

- III.j. analyze and evaluate social and economic effects of environmental changes and crises resulting from phenomena such as floods, storms, and drought

- VI.a. examine persistent issues involving the rights, roles, and status of the individual in relation to the general welfare

- VII.f. compare how values and beliefs influence economic decisions in different societies

- VIII.b. make judgments about how science and technology have transformed the physical world and human society and our understanding of time, space, place, and human-environment interactions

- IX.c. analyze and evaluate the effects of changing technologies on the global community

- IX.d. analyze the causes, consequences, and possible solutions to persistent, contemporary, and emerging global issues, such as health, security, resource allocations, economic development, and environmental quality

- IX.h. illustrate how individual behaviors and decisions connect with global systems

Materials/Preparation

- Handout: *Global Mall Dollars*, 1 card per student (there are 6 cards per sheet)

- Handout: *Global Mall Items*, 1 sheet per student

- (Optional) Teacher master: *Global Mall Impacts,* 1 copy as teacher reference

- Handout: *Choices and Impacts*, 1 per group

- Make enough copies of the *Global Mall Dollars* sheets so that there is 1 card for each student. (Each sheet has 3 $200 cards, 2 $1500 cards, and 1 $5000 card to reflect income distribution around the world. Therefore, more students will end up with $200 cards and $1500 cards than $5000 cards.) Cut the sheets along the dotted lines and fold each card so the amount is not visible.

Activity
Introduction

1. Have the class brainstorm human needs (shelter, food, water, energy, etc.).

2. Tell students that today they will have a chance to shop for some of their needs at the "Global Mall." The Global Mall sells resources that humans depend on to live, as well as some "nonessential" items.

Steps

1. Pass out the handout, *Global Mall Items*, which lists the items available. Tell students they can select items from the list to purchase with their *Global Mall Dollars,* but they must first meet basic needs for themselves and their families by selecting items from the categories of food, heat/fuel, and shelter. Only after these needs are met can they buy any of the other items.

2. Pass around a basket with the *Global Mall Dollars* and instruct each student to take 1 card and not show it to anyone. The $200 cards represent people who live in extreme poverty. (Approximately 40% of people around the world survive on less than $2 a day.)

3. Instruct students to write the items they purchase on the lines on their card (or on the back), along with the cost of each item (be sure they do this part of the activity individually).

4. While students are making their purchasing choices, keep the pressure on to instill a sense of urgency. Ask, "Who's done shopping?" Say, "The mall is closing soon!" Students with $200 *Global Mall Dollars* will likely finish much sooner than those with $1500 and $5000.

5. When students finish their shopping, have them break into 3 groups, putting students with the same dollar amounts ($200, $1500, $5000) together. (There will be more students with $200; if necessary, subdivide groups so you have 3-5 students per group.)

6. In their groups, have students complete the handout, *Choices and Impacts*. Ask them to discuss anything they could not afford to purchase and how not having those items might affect their lives.

7. Circulate between the groups and suggest impacts they might not have considered. Use the handout, *Global Resource Mall Impacts*, as a teacher reference.

8. Have each group report to the class on the decisions they made and the impact these decisions would have on their lives and on the lives of future generations. Answers to the questions on the *Choices and Impacts* handout are good starting points for more in-depth discussion.

Homework

Complete the handout, *Resource Use Analysis*. This will be revisited during the activity, *Are You Buying This?*

Geography Connection

Share the following information (from 2005 World Population Data Sheet of the Population Reference Bureau) with students:

Region	% of Earth's Population	% of World's Per Capita Gross National Product (in Purchasing Power Parity)
Africa	14	4
Asia	60	37
Europe	12	27
Latin America	9	8
U.S. and Canada	5	24

Have students write a paragraph explaining how resource distribution and poverty are linked to sustainability. To accompany their paragraphs, students might also want to create visual representations of the data, using graphs, maps, or photographs.

Action Project

Throw a BeadParty at your school through the BeadforLife project. BeadforLife is an organization that fights poverty by employing very poor women in Uganda to make beautiful jewelry out of recycled paper. This project provides you with the opportunity to help women feed their children and send them to school by selling their products, while at the same time educating yourself and your friends, parents, and community about Uganda and the plight of poor people around the world. For more information about hosting a BeadParty, visit www.beadforlife.org.

Additional Resources
Film

Unnatural Causes: Is Inequality Making Us Sick? – This four-part documentary from PBS explores how socioeconomic factors affect people's access to health care. One segment features a Pacific Northwest community hailed as a model for mixed-income communities. www.pbs.org/unnaturalcauses

Websites

- **www.netaid.org** – NetAid is a nonprofit organization that educates, inspires, and empowers young people to fight global poverty.

- **http://ibuydifferent.org** – The Center for a New American Dream encourages people to consume responsibly in order to protect the environment, enhance quality of life, and promote social justice. Their "I Buy Different" website provides ideas on how to have a positive impact on the world through consumption choices.

facing the future

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Global Mall Dollars

$200

Item	Cost
_____	
_____	
_____	
_____	

$200

Item	Cost
_____	
_____	
_____	
_____	

$200

Item	Cost
_____	
_____	
_____	
_____	

$1500

Item	Cost
_____	
_____	
_____	
_____	

$1500

Item	Cost
_____	
_____	
_____	
_____	

$5000

Item	Cost
_____	
_____	
_____	
_____	

Global Mall Items

Food	Rice and beans once or twice a day. All of this food is locally grown. $100	Beans, vegetables, and rice daily, plus meat/dairy about once a month. Most of this food is locally grown. $300	A variety of fast foods 2-3 times a day, such as a hamburger, chicken sandwich, tacos, french fries, soda, and ice cream. Most of this food is highly processed. $600	High quality food 3 times a day, including eggs, meat, fish, fresh vegetables, fresh imported fruit, bread, milk, imported cheese, and chocolate. Much of this food is organically grown using few chemicals. $900
Heat/Fuel	Firewood cut from a local forest, sometimes hours away. Most of this work is done by children and women. No cost	Coal purchased in the market and used for cooking and heating. $250	Oil used for cooking and heating. $600	Solar panels using the sun's energy to heat home and water; natural gas for cooking. $1500
Transportation	One bicycle shared by your family; walk when distance is less than 10 miles. $75	Community bus with 4 scheduled pick-up times in your community daily. $125	Older car for driving short distance; gets poor gas mileage. For long distances you have to take a bus or train. $700	Car large enough to carry a family of 5 people comfortably; includes air conditioning and a radio. $1200
Shelter	Small home made from sticks and mud. This home is in a rural area with no electricity. No cost	1-bedroom apartment in a large apartment building in a large city. $500	Suburban 2-bedroom house with a small front yard. $1000	Large 3-bedroom house with a pool in the backyard. This home is 15 miles away from where you work. $2000
Luxury Item	Radio running on batteries. $50	Small color television in your house. $150	Refrigerator in your house and air conditioning. $500	Hawaii surf vacation, including airline ticket, hotel, and souvenirs. $800

Global Mall Impacts

Food	***Rice and beans*** Environmental: no/less agricultural chemicals; little tilling of the soil Social: lack of essential vitamins results in more malnutrition	***Beans, veggies, meat*** Environmental: tilling soil releases carbon dioxide (CO2), which contributes to climate change; livestock release methane and require much food and water Social: good nutritional value	***Fast foods*** Environmental: water/feed for beef production, deforestation for cattle grazing; raising livestock and making fertilizers release greenhouse gases (climate change) Social: convenient but unhealthy, some fats linked to heart disease	***High quality food*** Environmental: deforestation for cattle grazing; greenhouse gas emissions and air pollution from transportation of imports; agricultural chemicals; air and water pollution Social: healthy but cash crops take away from staple food crops
Heat/Fuel	***Firewood*** Environmental: deforestation; desertification; fewer trees for carbon storage and oxygen production; air pollution Social: poverty (time away from school, work, food production); smoke linked to lung disease	***Coal*** Environmental: CO2 emissions; air pollution; water pollution from mining Social: easier to use than firewood, but may result in lung disease if cooking area is not ventilated; miners susceptible to lung disease and injuries	***Oil/Gas*** Environmental: oil drilling, spills, pipeline impacts; greenhouse gas emissions; air pollution; loss of habitat Social: convenient, but results in dependency on oil/gas supplies, often from foreign regions	***Solar panels*** Environmental: clean, renewable source of energy Social: convenient; sunlight is free; expensive to install but saves money in the long run; no health risks
Transportation	***Bicycle and walk*** Environmental: no greenhouse gas emissions, except from manufacturing the bike Social: good for physical health; often takes longer to bike or walk than to use motor transportation	***Bus*** Environmental: relies on fossil fuels and causes air pollution, but less than if each rider drove a single automobile Social: less air pollution (better for lung health); time spent waiting for bus	***Older car/Bus/Train*** Environmental: burns fossil fuels; exhaust pollutes air; train and bus pollute less per passenger Social: freedom to go to nearby places at any time	***Newer car*** Environmental: air pollution and greenhouse gas emissions; environmental resources to make car (e.g., metal from mining, plastic from petroleum) Social: freedom to drive anywhere and carry large items
Home	***Hut*** Environmental: removing sticks from forest leads to erosion and reduction of soil nutrients Social: continual maintenance required; difficult to keep out heat/cold and flies	***Small apartment*** Environmental: living in dense housing uses fewer environmental resources and requires less heating Social: close community; no yard; less privacy than a single-family home	***Two-bedroom house*** Environmental: suburban neighborhoods have many dead-end streets, requiring extra driving; water used to maintain yard Social: yard for recreation; potential stress of driving into city (traffic, accidents, etc.); gas expense	***Large house with pool*** Environmental: energy required to heat and cool large house; water and chemicals for pool; pollution from driving Social: economically exclusive neighborhood is often less culturally diverse; time and gas spent driving to/from work
Luxury Item	***Radio*** Environmental: energy required to manufacture and use; batteries toxic to soil Social: access to information; entertainment	***Color TV*** Environmental: resources to manufacture and use; pollution from improper disposal or recycling Social: access to information; entertainment	***Refrigerator*** Environmental: greenhouse gas emissions; resources to manufacture and use Social: convenient access to fresh food	***Surf vacation*** Environmental: burning jet fuel releases CO2; resources to make airplane; land used for airport and runways Social: lower stress; enjoyable; expensive

Choices and Impacts

Group Members: _____

Amount of money each group member started with: _____

Instructions: Select and list 4 items that members of your group purchased. Evaluate the sustainability of your choices by examining environmental and social impacts, whether positive or negative, for each item. Then discuss and write answers to the questions below.

Items Purchased	Environmental Impacts	Social Impacts

1. How would the choices you made affect the ability of future generations to meet their needs? (What are some environmental and social impacts? Are the impacts of your choices positive, negative, or neutral?)

2. How did your economic status affect your purchasing choices, including whether you were able to consider environmental and social impacts?

3. In what ways could you reduce the negative impacts of one of the items you purchased, while improving your quality of life?

4. In what ways might environmental degradation impact someone of your group's economic status?

5. What positive changes might occur if everyone had $5000 to spend? What negative changes might occur?

Resource Use Analysis

Name: _____

Instructions:

1. Use the following table to list 5 natural resources that you use on a daily basis. Natural resources are valuable resources (such as water, timber, fossil fuels, and metals) that occur in nature.

2. List all of the ways that you use each natural resource in the course of a particular day (for water this might include bathing, flushing the toilet, cooking, and washing clothes).

3. Consider how the use of each resource impacts your life. Try to think of both positive and negative impacts.

4. Consider how the use of each resource impacts the lives of others, whether in positive or negative ways.

5. Think about how the use of each resource impacts the environment.

6. Devise at least 2 ways that you can reduce the negative impacts associated with the use of each resource. This doesn't necessarily mean using less of the resource, although that is one possible solution.

Natural Resource You Use Daily	How and When You Use the Resource	Impacts (+ or -) on Your Life	Impacts (+ or -) on Other People	Impacts on the Ewnvironment	Ideas for Reducing Negative Impacts

Are You Buying This?

Students examine the influence of media on consumption habits by working in groups to create and present mock television commercials for products linked to unsustainable or unhealthy behaviors. Students first present the commercials as they would typically be seen on television and then present them a second time through the lens of sustainability. On a second day, students review their own energy and water consumption habits and then create commercials for alternative products that use these resources in a sustainable manner.

understanding sustainability

Key Concepts

- Media
- Consumerism
- Corporate responsibility
- Marketing
- Quality of life

Integrated Subject Areas

- Science (Environmental)
- Language Arts/Drama
- Journalism
- Business/Finance
- Health/Nutrition

Inquiry/Critical Thinking Questions

- How does advertising influence consumption?
- How does advertising shape a society's vision of "the good life"?
- Who bears responsibility for regulating the marketing and consumption of legal but harmful and/or unsustainable products?

Objectives

Students will:

- Recognize the connection between advertising and consumption choices and the unstated consequences of those choices
- Become critical consumers of marketing that is directed toward them, and recognize tactics used by advertisers to influence their behavior
- Understand the power of advertising in selling American values and ideals to foreign countries and cultures

NCSS Standards and Performance Expectations for High School Addressed

- I.a. analyze and explain the ways groups, societies, and cultures address human needs and concerns
- I.b. predict how data and experiences may be interpreted by people from diverse cultural perspectives and frames of reference
- IV.b. identify, describe, and express appreciation for the influences of various historical and contemporary cultures on an individual's daily life
- IV.c. describe the ways family, religion, gender, ethnicity, nationality, socioeco-

nomic status, and other group and cultural influences contribute to the development of a sense of self

- IV.f. analyze the role of perceptions, attitudes, values, and beliefs in the development of personal identity

- V.b. analyze group and institutional influences on people, events, and elements of culture in both historical and contemporary settings

- V.d. identify and analyze examples of tensions between expressions of individuality and efforts used to promote social conformity by groups and institutions

- V.g. analyze the extent to which groups and institutions met individual needs and promote the common good in contemporary and historical settings

- VII.b. analyze the role that supply and demand, prices, incentives, and profits play in determining what is produced and distributed in a competitive market system

- VII.f. compare how values and beliefs influence economic decisions in different societies

- IX.h. illustrate how individual behaviors and decisions connect with global systems

Materials/Preparation

- Handout: *Products and Consequences Cards*. Make 1 double-sided front-to-back copy with "Products" on 1 side and "Consequences" on the other, and cut into individual cards

- Blank paper and color pens/pencils for creating props/signage

- Completed *Resource Use Analysis* student handouts (for Day 2)

Activity – Day 1
Introduction

1. Ask students to do a 1-minute free-write on the following question: *Should sustainability concerns, including the true environmental and social costs of production, be included in advertisements?*

2. Ask the class if they have seen a television advertisement recently that made them really want to buy a product. Ask them if they remember how the ad presented the product. Was a celebrity promoting it? Did it feature people doing fun and exciting activities unrelated to the product? Were there attractive models involved?

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* Information from TNS Global (http://www.tns-mi.com/news/03252008.htm) and the American Academy of Pediatrics (http://aappolicy.aappublications.org/cgi/content/full/pediatrics;118/6/2563).

3. Tell the class that in 2006, companies in the U.S. spent nearly $150 billion advertising their products. The average young person views over 40,000 television ads each year, plus thousands more in magazines, billboards, and other outlets*.

4. Ask the class what, if anything, they think is left out of most advertisements. (Most ads leave out any negative consequences of producing and consuming the product, and generally only include information on potential dangers if required to do so by law, as with some advertising for prescription drugs. Typically, advertisers do not discuss the impact of their products on the environment or unfair labor practices unless the product is being marketed as "eco-friendly" or "socially responsible".)

5. Tell the class that they are going to try their talent at creating advertisements for products that are often marketed to people in the U.S. However, not only will they have to create 1 ad that makes the product look good, they will also have to create an ad that focuses on the product's less glamorous side.

Steps

1. Break the class into groups of 4-5 students.

2. Tell the students that they are going to get a card with the product they are in charge of advertising. 1 side of the card has some attractive selling points for the product. The other side has some of the consequences of consuming that product.

3. Tell the students that in order to effectively sell their product, they have to decide:

   a. What is the demographic they are selling to? (who they think will buy this product)

   b. What is the advertising technique they will use? Celebrity endorsement? Humor? Claims that using the product make you smarter/sexier/cooler?

4. Tell the students they have 15-20 minutes to create 2 commercials that they will act out in front of the class. One commercial will only focus on the attractive side of the product, and the other should only focus on the consequences. Both versions should attempt to sell the product. Students should use the same advertising technique for both ads. If they are using supermodels or extreme sports to sell the attractive side of the product, they should use supermodels and extreme sports to sell the consequences as well.

5. Tell the students that the ads have to be the same length as a regular television commercial, so each ad should not be longer than 1 minute.

6. After the groups put their ads together, have them present both commercials to the class, with the ad selling the attractive side of the product presented first.

7. Bring the class back together for reflection questions.

Assessment – Day 1
Reflection

1. When you were deciding how to sell your product, why did you choose the advertising techniques you did?

2. Do you think these advertising techniques influence what you and your friends purchase?

3. If you lived in a faraway country, and your only knowledge of the U.S. came from watching American commercials, what would you think were the most important values of our society?

4. Do you think Americans are sufficiently informed about the sustainability of our consumption habits? If not, how can we become more informed about sustainability issues?

5. How can the media influence sustainability?

6. Do you think advertising should be regulated more or less than it is now? How so? What changes would you like to see?

Homework – Day 1

Remind students to bring their completed *Resource Use Analysis* handouts to assist with tomorrow's activity.

Activity – Day 2
Steps

1. Tell the class that today they will make a commercial for a sustainable alternative to the product they advertised on Day 1 of this activity. They will need to focus their advertisement on how their new product will lessen the ecological footprint of the previous item with regard to natural resource use.

2. Divide the class into the same groups from Day 1. Have each group discuss the results of their individual *Resource Use Analyses*. Ask each group to share with the class what natural resources their group uses most on a daily basis.

3. Lead a discussion about what resources students think have the greatest negative impacts and how those impacts might be reduced.

4. Ask each group to turn their attention to the product they made commercials for on Day 1. Have each group brainstorm possible sustainable alternatives to the product. Ask the groups to come up with a sustainable product, or alternative activity, to their previous product. The alternatives could be items/activities

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that already exist or are new inventions. The sustainable features of their new product should focus on reducing the negative impacts of natural resource consumption. For example, if their original item was "handi-lunches," they might decide to make a commercial advertisement for fruit picked from a local farm or school garden. They might focus on how the fresh fruit takes less water to produce than the processed handi-lunches, generates very little waste, and provides jobs for local farm workers. For ideas to create a sustainable product alternative, students can refer to the student reading, *Ecological Footprint*.

5. You may need to remind groups to keep in mind the demographic they are marketing to and the technique they want to use. Each ad should be no longer than 1 minute.

6. Have each group perform their ads for the class.

7. Lead a brief discussion using the reflection questions below.

Assessment – Day 2
Reflection

1. Which advertised product appears the most sustainable? What features make it sustainable?

2. How did you decide on the alternative product? What features did you take into

consideration? Were there some features that you thought were more marketable than others?

3. Should sustainable products advertise the fact they are sustainable? Should companies be required to disclose unsustainable or negative consequences associated with producing, consuming, or disposing of their products?

4. Do you think your sustainable alternative would be widely used if people viewed your commercial? Why or why not?

5. Young people are a major target of many advertisements. Who should be most responsible for regulating what we consume—government, companies, or consumers?

6. Often the true costs of a product are not included in its price; rather, we say they are "externalized." What are some "costs" that might not be included in the price of the things we buy? (Two examples are pollution and safety hazards.)

Writing Connection

At home, have students analyze a commercial break during a program they typically watch. Have them record notes on each ad during the break, keeping an eye out for the following:

- What was the product?

- What was the brand?

- What was the marketing technique?

- What was the demographic the ad was targeting (women, teens, parents, the elderly)?

Instruct the students to pick out 1 of the products they recorded that might have consequences for their personal health and the health of the planet. Have the students research that product and write 1-2 paragraphs identifying how consumption of that product is connected to global sustainability, keeping in mind environmental, social, and economic impacts.

Action Project

Create a consumer's guide to locally available sustainable products. Compile a list of all the neighborhood stores and restaurants that sell and/or use sustainably produced items such as Fair Trade certified products, organic food, renewable energy sources, nonsweatshop clothing, etc. Then design a pamphlet, website, or poster to make this information accessible to the school or neighborhood community. If there are only a few sources of sustainably produced products available in your community, lobby one or several local business owners to offer more sustainable products or to use more sustainable practices.

Additional Resources
Films

- *Affluenza*, 1997, 56 minutes; and *Escape from Affluenza*, 1998, 56 minutes, John de Graaf, Bullfrog Films. Humorous documentary films on the history and effects of consumption and a growing movement to live simply and consume less. www.bullfrogfilms.com

- *China Blue*, 2005, 86 minutes, Micha Peled, Teddy Bear Films. This film, part of the Independent Lens series on PBS, takes you inside blue jeans factories in China. The film focuses on a 17-year-old garment worker named Jasmine. www.pbs.org/independentlens/chinablue/

Book

Fast Food Nation, Eric Schlosser, Perennial, 2002. An exposé of the fast food industry with a large section focusing on how junk food is marketed to youth.

Magazine

Adbusters Magazine. A not-for-profit, reader-supported magazine concerned about the erosion of the physical and cultural environment by commercial forces. www.adbusters.org

Websites

- **www.commercialalert.org** – Focuses on campaigning to limit exposure to advertising and the effects of advertising and commercialism on kids' health.

- **www.marketingpower.com** – The American Marketing Association's website provides information on marketing, including history, best practices, and a code of ethics.

- **www.coopamerica.org** – Co-op America offers practical steps for using your consumer and investor power for social change.

- **www.terrachoice.com** – TerraChoice Environmental Marketing, Inc. provides a list of the "Six Sins of Greenwashing" to educate people about false marketing claims of environmental sustainability.

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Product Cards (front)

The Ultra Behemoth Burger

- 4 beef patties, a full half-pound of meat!
- 6 slices of cheese
- 5 strips of smoked bacon
- Incredible low price of $1.99
- Available 24 hours a day

The Dominator XL SUV

- Over 12 feet long
- 4 wheel drive
- Fits 8 people comfortably
- Includes 6 disc CD player and TV sets in each seat
- Protects your family in case of accident

Pine Valley Estates

- Magnificent all-wood dream homes
- Located in a quiet wooded area
- Over 4,000 square feet, plus 2 acres of private land
- Only a 30 minute drive from the city center

Super Clean Car Wash Foam

- Keeps your car shiny and new looking
- Removes even the most stubborn stain
- Protects your paint job from scratches
- Makes every car look expensive

Handi-Lunches

- A complete pre-packaged lunch for kids
- Saves time spent preparing food
- Kids love the taste
- Includes healthy meats, cheeses, snacks, and a drink

Mega Cool Jeans

- Stylin'
- Very hip—worn by famous people
- Flattering for all shapes and sizes
- Only $35 a pair

Information from TNS Global, American Academy of Pediatrics, American Diabetes Association, and U.S. EPA.

Consequence Cards (back)

The Ultra Behemoth Burger

- It takes over 600 gallons of water to produce 1 beef patty
- Approximately 17% of children and adolescents in the U.S. are obese
- Annual healthcare costs for a person with diabetes is about $12,000 (more than twice the cost for a nondiabetic)

The Dominator XL SUV

- Climate change caused by fossil fuel pollution contributes to the extinction of species, loss of arable land, and destruction of natural habitats
- Car exhaust contributes to smog, which can exacerbate respiratory illnesses such as asthma

Pine Valley Estates

- Over a 5-year period, 6 million acres of farmland in the U.S. were paved over for homes
- About half of the earth's forests have already been destroyed
- Deforested areas suffer from flooding, mudslides, and lack of biodiversity

Super Clean Car Wash Foam

- Washing your car at home puts hazardous chemicals into streams, rivers, and oceans
- Runoff from car wash soap contaminates fish we eat and kills plants
- Frequent car washing wastes hundreds of gallons of water

Handi-Lunches

- Each food item is wrapped in nonrecyclable plastic, which is made from petroleum oil, a nonrenewable resource
- The discarded plastic contributes to the amount of trash that ends up in landfills and incinerators
- In 2006, the U.S. threw away over 250 million tons of garbage

Mega Cool Jeans

- Sewn in a sweatshop by 12- year-olds who work 16 hour days and are not paid minimum wage
- Workers do not have time to go to school, so they always stay poor
- Made from nonorganic cotton – one of the crops most heavily sprayed with toxic chemicals

Information from TNS Global, American Academy of Pediatrics, American Diabetes Association, and U.S. EPA."

What Makes a Civilization Sustainable?

Students read about past

societies, drawing conclusions about why they may have failed. Causes of failure are grouped into broad categories. Students explore ways in which the lessons of the past can be applied to modern societies to ensure sustainability.

Adapted from "The Untold Story of Collapse" by Ben Wheeler, Explorer West Middle School

Key Concepts

- Civilization collapse
- Sustainable societies
- Historical analysis

Integrated Subject Areas

- Science (Biology, Environmental)

Inquiry/Critical Thinking Questions

- Why do some civilizations thrive and others fail?
- What lessons can we learn from past societies that might contribute to the sustainability of modern society?
- What are some examples of modern-day societies that exhibit sustainable features?

Objectives

Students will:
- Explore possible causes of the failure of past civilizations
- Determine features of a sustainable society
- Apply historical understanding to solve modern sustainability challenges

NCSS Standards and Performance Expectations for High School Addressed

- I.a. analyze and explain the ways groups, societies, and cultures address human needs and concerns
- I.b. predict how data and experiences may be interpreted by people from diverse cultural perspectives and frames of reference
- I.c. apply an understanding of culture as an integrated whole that explains the functions and interactions of language, literature, the arts, traditions, beliefs and values, and behavior patterns
- I.d. compare and analyze societal patterns for preserving and transmitting culture while adapting to environmental or social change
- II.b. apply key concepts such as time, chronology, causality, change, conflict, and complexity to explain, analyze, and show connections among patterns of historical change and continuity
- II.c. identify and describe significant historical periods and patterns of change within and across cultures such as the development of ancient cultures and civilizations, the rise of nation-states, and

social, economic, and political revolutions

- II.d. systematically employ processes of critical historical inquiry to reconstruct and reinterpret the past, such as using a variety of sources and checking their credibility, validating and weighing evidence for claims, and searching for causality

- II.e. investigate, interpret, and analyze multiple historical and contemporary viewpoints within and across cultures related to important events, recurring dilemmas, and persistent issues, while employing empathy, skepticism, and critical judgment

- II.f. apply ideas, theories, and modes of historical inquiry to analyze historical and contemporary developments, and to inform and evaluate actions concerning public policy issues

- III.e. describe, differentiate, and explain the relationships among various regional and global patterns of geographic phenomena such as landforms, soils, climate, vegetation, natural resources, and population

- III.f. use knowledge of physical system changes such as seasons, climate and weather, and the water cycle to explain geographic phenomena

- III.g. describe and compare how people create places that reflect culture, human needs, government policy, and current values and ideals as they design and build specialized buildings, neighborhoods, shopping centers, urban centers, industrial parks, and the like

- III.h. examine, interpret, and analyze physical and cultural patterns and their interactions, such as land use, settlement patterns, cultural transmission of customs and ideas, and ecosystem changes

- III.i. describe and assess ways that historical events have been influenced by, and have influenced, physical and human geographic factors in local, regional, national, and global settings

- III.j. analyze and evaluate social and economic effects of environmental changes and crises resulting from phenomena such as floods, storms, and drought

- V.b. analyze group and institutional influences on people, events, and elements of culture in both historical and contemporary settings

- VI.d. compare and analyze the ways nations and organizations respond to conflicts between forces of unity and forces of diversity

- VI.f. analyze and evaluate conditions, actions, and motivations that contribute to conflict and cooperation within and among nations

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- VIII.b. make judgments about how science and technology have transformed the physical world and human society and our understanding of time, space, place, and human-environment interactions

- VIII.e. recognize and interpret varied perspectives about human societies and the physical world using scientific knowledge, ethical standards, and technologies from diverse world cultures

- IX.b. explain conditions and motivations that contribute to conflict, cooperation, and interdependence among groups, societies, and nations

- IX.d. analyze the causes, consequences, and possible solutions to persistent contemporary and emerging global issues, such as health, security, resource allocation, economic development, and environmental quality

Materials/Preparation

- Handout: *Civilization Collapse Summaries*, 1 per group of 3-4 students

- (Optional) Library or Internet access for independent research

Activity
Introduction

1. Ask students why we study history. (Often, we study history to try to avoid repeating past mistakes or to inspire us to attempt to recreate past successes.)

2. Ask the class if they can remember studying a historic civilization that no longer exists today. What groups of people have they heard about that no longer exist today? (Examples might include ancient Rome, Egypt, Easter Island, and the Vikings.)

3. Tell them that today they will explore possible causes for the collapse of past civilizations.

Steps

1. Break the class into groups of 3-4. Distribute a *Civilization Collapse Summary* to each group. For large classes, more than 1 group may receive the same summary. Remind students that these summaries represent 1 interpretation of historical evidence; there are many other interpretations.

   - **Lesson Variation**: If you have sufficient time and resources (library or Internet access), students can research these and other civilizations such as the Incas and Ancient Mesopotamia without the use of the prepared summaries. (See a list of web resources in the Additional Resources section of this lesson.) Or,

you may want students to complete this exercise for particular civilizations they have recently studied.

2. Ask each group to read their summary together. Have them take turns reading the paragraphs.

3. Have each group identify at least 2 possible causes for the catastrophic events experienced by their civilization, as well as ideas for how those causes could have been mitigated and the catastrophe avoided. For example, if a group determines that a particular civilization collapsed because they over-farmed their land, they should brainstorm ways that the civilization could have fed itself without destroying the land. Allow 20-30 minutes for this part of the activity.

4. Ask each group to present their suggested causes for collapse to the class, writing their causes on the board and explaining the evidence for their conclusions. Allow each group 1-2 minutes for their presentation.

5. After each group has presented and written their causes on the board, ask the class to organize the causes into broad categories. In *Collapse*, Jared Diamond suggested the following factors as contributors to the collapse of civilizations: environmental damage,

climate change, hostile neighbors (i.e., conflict), loss of support from friendly trade partners (i.e., allies), and a society's responses to environmental problems. Your students may come up with similar or different categories.

6. Conclude with the following discussion questions.

Assessment
Reflection

1. Why do you think many civilization collapses cannot be traced back to a single cause?

2. Why do you think researchers often disagree about the causes of historical collapse events?

3. What are some present-day examples of societies struggling with similar potential causes of collapse that you identified for past failures? Are there states or cities in the U.S. that have unsustainable practices or structures?

4. How can we apply information learned from past collapses to promote the sustainability of societies and cultures? How can you use this information to help your neighborhood or community?

5. Describe possible characteristics of a sustainable society.

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Homework

Read Student Reading 3, *Urban and Community Planning*.

Extension Activity

The summaries presented are based on historical analysis by Jared Diamond in his book, *Collapse*. Have students read chapters from *Collapse* for a more thorough investigation of ideas presented by Diamond. Then, encourage them to investigate other sources of information to find additional pieces of evidence or theories not presented in *Collapse*. Why do you think Diamond did not include certain pieces of evidence in his analysis? Why do you think he drew certain conclusions from evidence when other researchers have suggested different conclusions? Which historical analyses of past civilizations do you think are most accurate, and why?

History Connection

Examine a modern-day conflict between 2 or more groups of people, such as conflicts documented in Rwanda, Darfur, or Northern Ireland. Identify possible root causes, predictions, and solutions. How might this conflict affect the sustainability of the cultures, economies, and environments of the affected region? How might the rest of the world be impacted by the conflict?

Action Project

As a class, brainstorm examples of practices or structures in your community that could be changed to promote environmental, economic, or social well-being. Choose 1 of the examples to act on. Think of ways that the practice or structure could be altered to promote community sustainability and reduce conflict, struggle, or environmental degradation. Just a few ideas include converting a deserted parking lot into a playground, supporting a struggling business that is important to the community, refurbishing deteriorated community landmarks, and adjusting the library's operating hours to better accommodate citizens.

Additional Resources
Film

Ancient Futures: Learning from Ladakh, The International Society for Ecology & Culture, 1993, 59 minutes, www.isec.org.uk. This video documents the changes that Western development brought to the high mountain city of Ladakh in northern India. Ladakh, a culture of Tibetan Buddhism and sustainable agricultural practices, struggled with the coming of television, drugs, consumerism, and industry.

Websites

- **www.wsu.edu/~dee/WORLD.HTM** – "World Civilizations: An Internet Classroom and Anthology" is a project of Washington State University. Users can browse resources about ancient and modern civilizations and events.

- **www.archaeology.org** – Archaeology is a publication of the Archaeological Institute of America. On this website you will find the latest news about archaeology, interactive digs, and interviews with archaeologists.

- **www.mnsu.edu/emuseum** – This EMuseum from Minnesota State University, Mankato includes resources on anthropology, archaeology, biology, cultures, history, and prehistory.

- **www.civilization.ca** – This joint website of the Canadian Museum of Civilization and the Canadian War Museum hosts virtual exhibits and digitized collections from the museums.

- **www.nationalgeographic.com/history** – The National Geographic "History" webpage includes photos, videos, and articles about ancient peoples and places.

- **www.mnh.si.edu** – The Smithsonian Museum of Natural History provides online videos and information about current exhibits and ongoing research programs related to anthropology, biology, and mineral sciences.

facing the future

The Anasazi of Chaco Canyon

The Anasazi were a Native American people that lived in the present-day U.S. Southwest. There were a number of different groups of Anasazi living in separate areas. Their people did not disappear altogether but were rather incorporated into other Native American societies, such as the Hopi and Zuni.

Southwestern crops included corn, beans, and squash, originally domesticated in Mexico. By 1 A.D. some Native Americans had already shifted from a hunter-gatherer lifestyle to a more sedentary lifestyle dependent on agriculture. Since the American Southwest has very little rainfall, water availability was the largest agricultural challenge. Several methods for farming in this region emerged, including farming in higher elevations with more rainfall, farming in areas where the underground water table is near the surface, and farming with rainfall captured in ditches.

Pueblo Bonito in Chaco Canyon, an area in present-day northwestern New Mexico, became a large permanent settlement. It was inhabited for several hundred years. The Anasazi at Pueblo Bonito planted fields in different places in hopes that enough of the sites would get rainfall to produce food that could be distributed to people in places that did not receive much rainfall. The Chaco Anasazi society existed from around 600 to 1150 A.D. One advantage of the Canyon's position was that it received rain runoff from higher areas. The Anasazi built dams to store rainwater runoff to irrigate their fields.

Today no trees can be found around Pueblo Bonito. Researcher Julio Betancourt found that pinyon pine and juniper trees were present prior to 1000 A.D. The Chaco Anasazi built extremely tall buildings made of pinyon pines and used juniper for firewood.

The Chaco people turned to other trees when the pinyon pines and junipers were no longer available. They logged ponderosa pine, spruce, and fir trees from up to 50 miles away and carried them back to Chaco Canyon. An increase in construction began in 1029 A.D., and population also increased at that time. The peak population size is not known—some archaeologists believe there were fewer than 5000 residents, while others think the population was much larger than 5000.

There were three types of buildings—large "Great Houses" inside the Canyon, Great Houses outside of the Canyon, and small homes with a few rooms. Items found in Great Houses included more luxury goods such as jewelry and pottery, as well as more deer and antelope bones (indicating a plentiful diet) than anything found in the small homes.

The last known construction at Pueblo Bonito included a wall to close off an area that had formerly been open. Defensive walls in other Southwestern areas indicate that warfare among various Anasazi groups occurred in the late 1100s and early 1200s.

Tree rings indicate a drought that began in 1130 A.D. Chaco Canyon was abandoned between 1150 and 1200 A.D. It is unknown what happened to those who left. Perhaps some starved to death or killed each other; others may have relocated to other areas. Because very little pottery and other household objects were found, it seems that the Chacoans took necessities with them— indicating that the evacuation from Chaco Canyon appears to have been planned.

Easter Island

Easter Island, also known as Rapa Nui, is a very remote island in the Pacific Ocean. It is sixty-six square miles with three volcanoes. Its inhabitants are of Polynesian descent; the nearest Polynesian island is 1,300 miles to the west. Easter Island is subtropical and cooler than other Polynesian islands, which are closer to the equator. Its surrounding ocean is too cold for coral reefs. Thus, it has many fewer fish species than tropical islands do. It is also windy and receives about 50 inches of rainfall each year, which is lower than rainfall in other Polynesian islands.

Due to volcanic activity, Easter Island soils are fertile. Past island residents grew bananas, taro, sweet potato, sugarcane, and paper mulberry, and raised chickens. Large stone-lined pits were used as composting pits. Stone dams that diverted water were found across an intermittent stream bed. Over 1,000 large stone chicken houses with small entrances in the front were left on the island.

Investigation of garbage shows that initially the islanders ate a great deal of porpoise, a fish that could not be caught near the shore. Eventually porpoises and other open-sea fish disappeared from their diet. Zoo archaeologist David Steadman has determined that Easter had six species of native land birds at one time, but none remain today, so land birds would have disappeared from islanders' diets. One source of meat that remained plentiful was rats. Easter Island is the only Polynesian island where rat bones outnumber fish bones in the waste the islanders left behind.

Radiocarbon dating of wood charcoal and bones of porpoises eaten by people suggest that humans inhabited Easter Island as early as 900 A.D. Estimates of Easter's peak population range from 6,000 to 30,000.

One of the most striking features of Easter Island is its large stone statues (called moai) and platforms to support the statues (called ahu). Approximately 300 ahu have been found. Ahus can weigh over 9,000 tons! Some are small, but the tallest moai is 13 feet high. Indirect dating methods suggest that most ahu building occurred during 1000-1600 A.D. Of the 887 moai found on Easter, half are still in the stone quarry where they were carved. The tallest statue to be erected outside of the quarry is thirty-two feet tall and weighs seventy-five tons. Dating methods tell us that over time Easter Islanders built larger and larger statues. Many people wonder how humans could transport such gigantic stone statues from the rock quarry to other locations on the island without modern equipment.

Regardless of how they moved such massive structures, we know that it was a large amount of work that required many people who would have needed extra food to support physical labor. Presumably moving the statues also required rope and timber, but only a few small trees can be found on Easter Island today.

Researchers have found evidence from pollen analysis and fossils that tall trees and woody bushes could be found on Easter for hundreds of thousands of years before people arrived. Charcoal evidence indicates that trees were used as fuel for cooking fires and for cremation. Trees may have also been used for fiber for rope and cloth, for transporting moai, and for building canoes.

There is evidence from oral traditions and archaeological surveys that the island was divided into eleven or twelve territories, and each territory had a different leader. Different territories contained different natural resources, for example, certain types of stone can only be found in a single volcano. Also, some territories were better suited for agriculture, and others supported coastal fishing. A civil war erupted in the late 1600s, when territorial chiefs were overthrown. Many of the moai were toppled and broken.

In 1722, Dutch explorer Jacob Roggeveen landed on the island. Other European visitors followed, bringing new diseases to the island. In the 1800s many islanders were kidnapped and sold in South America as slaves. By 1872 only 111 inhabitants remained. Sheep, goats, and horses were introduced onto the island in the late 1800s and overgrazed the remaining vegetation. Now Easter Island is officially a Chilean territory.

The Greenland Norse

Greenland is a large island located in the Atlantic and Arctic Oceans. Ninety-nine percent of the island is uninhabitable because it's too cold, icy, or impassable by humans. The weather is frigid, windy, foggy, and wet. The most accessible and inhabitable land on Greenland is nestled deep in two fjords in the southern portion of the island. It was there that Scandinavian settlers, called Vikings or Norse, lived between 984 A.D. and the 1400s.

The Norse lived in Scandinavia (modern day Sweden, Norway, Finland, and Denmark) around the late eighth century. From 793 A.D. through 1066 A.D, they were feared throughout Europe for their violent raids on cities and towns. Beginning around 800 A.D. the Norse settled islands in the north Atlantic, arriving in what is today called Greenland in the tenth century. While the Greenland Norse society disappeared after nearly 500 years, the Inuit (native North Americans who also lived in Greenland) survived for thousands of years.

The Norse had two settlements in Greenland that were roughly 300 miles apart. Historians and archaeologists believe that there were about 5,000 inhabitants who lived on roughly 250 family farms. They had a hierarchical social structure with chiefs that ruled small parcels of land. In 1261, the Greenland Norse became subjects of the King of Norway, and then in 1380 they became Danish subjects when Norway was subsumed by the Danish monarchy.

Norse settlers brought cows, sheep, goats, and pigs to Greenland. The temperatures were often too cold for cows and pigs, so sheep and goats became their staple livestock. To keep the animals alive in winter, the Norse had to keep them sheltered and feed them hay that was harvested in summer. The Norse also hunted caribou and seals for food, but they did not eat fish. The Norse were limited to growing small amounts of cabbage and barley, as other crops couldn't survive.

The Norse relied on wood for fuel and building. According to Norwegian records and archaeological evidence, the Norse settlers used tar, iron, and timber for building and tools. However, those items were scarce or unavailable in Greenland so the Norse imported them from Europe in exchange for walrus tusks and walrus and polar bear hides. Around 1000 A.D., the Greenland Norse converted to Christianity and began devoting a lot of timber, labor, and resources to constructing churches and paying taxes to the Pope.

The Inuit people settled in Greenland around 700 A.D but didn't come in contact with the Norse until centuries later. They lived north of the Norse settlements, in an area that the Norse used for hunting in the autumn. The Inuit lived in igloos, and they burned seal or whale blubber as fuel. They made boats out of stretched sealskins over wooden frames that were big enough to use for whale hunting. The Inuit hunted caribou, whale, seal, and fish for food. Archaeological evidence suggests that the Inuit adopted some Norse technology, including the use of a few knives and saws. There is no evidence of the Norse adopting any of the Inuit technology or hunting techniques.

Ice cores in Greenland show that in the 1300s the climate began to get colder and less predictable. This cooling, known as the Little Ice Age, lasted until the 1800s. The Inuit survived by hunting seal species, like the Ring seal, that survive better in colder temperatures than other species. The Norse continued to rely on growing hay and grazing livestock for their main source of food. Hay, grass, and timber grew more slowly and less abundantly in the colder weather.

The colder temperatures increased ice cover and icebergs in the seas, which limited transportation and communication with Europe. According to historical records, there was no European contact with Greenland between 1410 and 1576. The last written record of the Norse settlements in Greenland was in 1410, and archaeological evidence suggests that by the mid-1400s the Greenland Norse had completely died out.

Information from *Collapse: How Societies Choose to Fail or Succeed* by Jared Diamond (New York: Viking, 2005).

Mangareva, Pitcairn, and Henderson Islands

The islands of Mangareva, Pitcairn, and Henderson are in an area known as Southeast Polynesia, in the Pacific Ocean. They lie over 1,000 miles from the nearest large populous Polynesian islands. They were settled around 800 A.D. by Polynesians.

Mangareva, the easternmost group of islands and ten square miles in area, had more natural resources than the other two islands. The island has a large lagoon, twenty-four extinct volcanic islands, and a number of low-lying coral atolls. Its lagoon and surrounding oceans are home to many fish and shellfish. Mangareva's higher islands received enough rain for intermittent streams and they were forested at one time. Island inhabitants raised sweet potato, yam, taro, and bananas. It is estimated that farming and fishing on Mangareva would have been able to support several thousand people.

One resource not present on Mangareva was high-quality stone for making tools. However, Pitcairn Island, which lies 300 miles southeast of Mangareva, did have volcanic glass and basalt useful for making tools. At only 2.5 square miles, Pitcairn is a much smaller island than Mangareva. It had intermittent streams and forests like Mangareva but the land was unfit for agriculture. Fishing is also difficult on Pitcairn because its coastline lacks a coral reef area. The population on Pitcairn was never very large, probably no more than a couple of hundred people.

Henderson Island is a fourteen square mile island that lies 100 miles northeast of Pitcairn and 400 miles east of Mangareva. It is a coral reef that lies 100 feet above sea level. No rocks for tool making can be found on Henderson. It has no freshwater streams, though there is a freshwater spring in the nearby ocean. There is little soil on Henderson and trees there are small, no larger than 50 feet high. A variety of fish, shellfish, and other edible creatures live in the reef. Henderson is also home to a rare nesting beach for green turtles. At one time, Henderson supported at least seventeen species of seabirds and nine species of land birds, all of which are edible.

While the land itself seems treacherous, evidence shows that there was a small permanent population on Henderson. Human bones of adults and children were found, as well as a large midden for burying trash. Henderson residents lived in caves rather than houses. Although land for agriculture was scarce, they planted crops such as coconuts, bananas, taro, timber trees, and fibrous trees for making rope.

Archaeologist Marshall Weisler found evidence of trade among the three islands. Trade began in 1000 A.D. or before and continued until 1450. Fishhooks made from oyster shells and tools made from stone were found on Henderson, an island that lacked those natural resources. Further investigation found that oyster shells from Mangareva were exported to Pitcairn and Henderson, and volcanic glass and rock from Pitcairn made their way to Mangareva and Henderson. Other materials such as food resources were probably traded among the three islands. Also, small populations on each island meant that people may have intermarried with people from the other islands.

The once hilly terrain of Mangareva eroded after trees were removed to create farmland. Eventually Mangareva's population experienced a civil war. Rather than a system of hereditary chiefs, nonhereditary warriors ruled. Deforestation and soil erosion also occurred on Pitcairn Island. Several species of land and seabirds went extinct on Henderson. Rats from boats that arrived on Henderson preyed on the birds; their descendants remain on the island today.

Inter-island trade ended by 1500 A.D. In 1606 a Spanish ship landed on Henderson and found no one living on the island. When British mutineers from the H.M.S. Bounty landed on Pitcairn Island in 1790, they found no one. The population on Mangareva likewise went extinct.

Information from *Collapse: How Societies Choose to Fail or Succeed* by Jared Diamond (New York: Viking, 2005).

Maya

The Maya civilization lived in the Yucatán Peninsula of Mexico and Central America. The area in which Maya cities were located was 104,000 square miles. The Maya had a highly developed society, including a written language, multiple cities, art, and architecture. The Maya wrote books on subjects such as astronomy and their calendar, which began on August 11, 3114 B.C. While the ancient Maya cities are now uninhabited ruins, Maya people still live in the region and speak their own languages.

The Maya region is too far from the equator to be considered tropical. There is a rainy season from May to October and a dry season from January through April. The southern part of the Yucatán Peninsula receives more rainfall and has soil better suited for agriculture than the northern region. However, rain from one year to the next can be variable and unpredictable. To collect water in the southern region, the Maya dug out areas and plastered the bottoms to create water catchments, or reservoirs. In the city of Tikal, reservoirs held enough drinking water for 10,000 people for 18 months.

Maya farmers raised corn and beans. Analysis of Maya skeletons shows that at least seventy percent of their diet came from corn. Their diet was low in protein. They had only a few domesticated animals, including turkey and duck, and they also ate wild deer and fish.

Many people previously believed that Maya agriculture was a slash-and-burn system, in which a forest is burned and crops are grown on the burned area for a few years. However, this type of agriculture is not believed to be able to support the high population densities of the Maya societies. Therefore, the Maya probably employed methods that encouraged increased food production.

Maya society was hierarchical. Peasants raised the food without draft animals to assist their work. They comprised at least seventy percent of Maya society. Maya kings acted as priests in charge of rituals, responsible for bringing rain and prosperity from the gods.

Maya society was composed of many small kingdoms. These groups were continually at war with one another. Archaeological evidence from defensive structures, stone monuments, painted murals, and written histories indicates that their warfare became more intense near the time of the civilization's major collapse. Their warfare was extremely violent; captives were tortured and killed.

The total Maya population was once quite large, perhaps numbering at least 5,000,000 people. However, individual Maya cities were usually fairly small; none was larger than 500,000 people. Maya population exploded beginning in 250 A.D. and reached its peak in the 700s, the time when its largest monuments were built. The Maya built huge temples using only human power. They had no metal tools (only stone and wood tools), pulleys, wheels, or domestic animals to carry heavy materials.

Radiocarbon-dated layers of sediment (soil and sand) from the bottom of Maya lakes reveal alternating wet and dry periods, each lasting hundreds of years. The worst drought in 7,000 years began around 760 A.D., lasting through the year 800 A.D. Droughts in the region occur roughly every 200 years.

The last known date inscribed on any Maya monument is 909 A.D. Although their population declined dramatically, the Maya did not completely disappear. And not all Maya cities collapsed at the same time. However, symbols of their great civilization did become extinct, including kings and calendars. When Spanish explorer Hernando Cortés and his army traveled through the southern region of Maya territory, they found very few people in the area. In fact, just one percent of the peak population remained at that time (about 50,000 people). In 1527 A.D., the Spanish began their attempt at conquering the Maya; they succeeded in overthrowing the last settlement in 1697. While the Spanish did much to destroy Maya culture during the intervening years, they also created detailed descriptions of Maya society.

Putting Our Community on the Map

In groups, students create representational maps of their school and the surrounding community in order to conceptualize and understand the relationships between neighborhood resources, the environment, community, and sustainability. Students then brainstorm specific ways to make the school neighborhood more sustainable through improvements to the physical environment and revise their maps to reflect these enhancements. A homework assignment asks students to assess the availability of important resources near their homes. In an extension activity, students present their ideas to community stakeholders.

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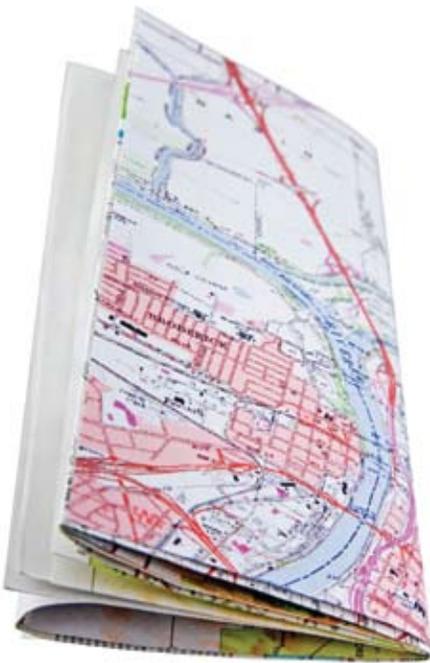
Key Concepts

- Sustainable communities
- Community planning

Integrated Subject Areas

- Art
- Science (Environmental)

Inquiry/Critical Thinking Questions

- What are some features of a sustainable community?
- How could the sustainability of your community resources be improved?

Objectives

Students will:

- Create maps to illustrate key features of their school and surrounding neighborhood environs
- Generate ideas for enhancing the sustainability of their school community
- Evaluate access to critical resources in their home neighborhoods

NCSS Standards and Performance Expectations for High School Addressed

- III.a. refine mental maps of locales, regions, and the world that demonstrate understanding of relative location, direction, size, and shape

- III.b. create, interpret, use, and synthesize information from various representations of the earth, such as maps, globes, and photographs

- III.c. use appropriate resources, data sources, and geographic tools such as aerial photographs, satellite images, geographic information systems (GIS), map projections, and cartography to generate, manipulate, and interpret information such as atlases, data bases, grid systems, charts, graphs, and maps

- III.g. describe and compare how people create places that reflect culture, human needs, government policy, and current values and ideals as they design and build specialized buildings, neighborhoods, shopping centers, urban centers, industrial parks, and the like

- III.h. examine, interpret, and analyze physical and cultural patterns and their

interactions, such as land use, settlement patterns, cultural transmission of customs and ideas, and ecosystem changes

- III.k. propose, compare, and evaluate alternative policies for the use of land and other resources in communities, regions, nations, and the world

- IV.a. articulate personal connections to time, place, and social/cultural systems

- IV.c. describe the ways family, religion, gender, ethnicity, nationality, socio-economic status, and other group and cultural influences contribute to the development of a sense of self

- X.j. participate in activities to strengthen the "common good," based upon careful evaluation of possible options for citizen action

Materials/Preparation

- Butcher paper, 1 sheet for each group of 3-4 students

- Pencils

- Marking pens

- (Optional) Additional drawing supplies, such as erasers and rulers

- (Optional) Internet access

Activity – Day 1
Introduction

1. Ask students the following question: What is the purpose of a map? (In general, maps show how things are related.)

2. Tell the class that they are going to create a representational map of their school and its surrounding community.

3. Review the word "community" with students. What is a community? (A community involves a group of people living in a particular location.)

Steps

1. Divide the class into groups of 3-4 students. Provide each group with a sheet of butcher paper, pencils, and other drawing supplies (rulers, erasers, etc.).

2. Their task is to draw their school and the neighborhood that surrounds it. Tell students that a representational map like the one they are going to draw does not need to be accurate—in fact, a 2-dimensional map of Earth's curved surface will never be accurate. Their maps should show relative spatial relationships rather than exact distances. For example, a post office that is four blocks away from the school should be farther away from the school on the map than a park that is two blocks away.

3. On the map students should clearly label things that are important to them and/ or that they think are important to the

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community. Note that different groups will draw maps that include (or omit) different attributes of the neighborhood. The maps may be of varying scales and may be drawn from an aerial or other viewpoint.

Optional: If time permits, lead the class on a walk around the school grounds and surrounding neighborhood to identify physical features of the community, such as streets, buildings, and green space.

4. Ask each group to briefly present their map to the class. They should explain why they included certain things (or omitted other things) and discuss why they chose to orient the map the way they did.

5. Assign them the following homework assignment, asking them to complete it before the next day's activity.

Assessment – Day 1
Reflection

1. Are there places, resources, or streets that every group included in their maps? What are they? Why do you think that every group included them?

2. Are there things that some groups included in their map that others did not? Why do you think this happened? (People relate to space in different ways. For example, if you've never been to any stores on a certain street, you might choose not to include them on a map.)

Homework – Day 1

Count and list all of the resources within the following categories that are within walking distance of your home (approximately 1 mile):

- Transportation (bicycle shops, gas stations, bus stops, bike lanes)

- Recreation (parks, playgrounds, sports facilities)

- Food (supermarkets, farmers markets, convenience stores, community gardens)

- Health care (emergency rooms, hospitals, doctor's offices, dentists)

If students live in a rural area where none of the above are located within walking distance, expand the distance for the resource inventory to 5 or 10 miles.

(Optional) Have students bring to class 1 photograph or drawing of a place they consider sustainable and 1 of a place they consider unsustainable. Ask them to write 1 paragraph for each photograph, giving reasons for why they consider each place to be sustainable or not.

Activity – Day 2
Introduction

1. Review homework results—ask students what they consider to be the best features of their neighborhoods, as well as what could be improved.

2. In a think-pair-share activity, have students create a list with a partner

of 5-10 components of a sustainable community. Ask student pairs to first develop their own definition of "sustainable community." With that definition in mind, they can brainstorm 5-10 specific features of a sustainable community, including physical features, governance structures, and community services. Allow 5 minutes for this part of the activity.

3. Have each pair share their list with the entire class. Compile all suggested sustainable community components on the board.

4. Ask the class to share their opinions about how sustainable they consider their community or neighborhood. Does their neighborhood have any of the features the class brainstormed?

Steps

1. Have students reconvene in their groups from Day 1 with their pencil-drawn maps.

2. Ask them to discuss specific ways of enhancing the sustainability of their school and surrounding community. Challenge them to think of at least 5 specific ways that the environmental health, social well-being, and economic prosperity of their school neighborhood could be increased through improvements to the physical environment. They will need to identify

specific things that would promote environmental, social, and/or economic sustainability within the community.

3. Pass out colored marking pens. Now ask student groups to make their proposed changes to their original maps in order to create maps of how they want their school community to look. Completed maps should be in full color. Allow approximately 30 minutes for this part of the activity.

4. Display the completed color drawings around the room, and allow students to do a short art walk around the room to see each group's sustainable community map.

5. Reconvene the class and ask them the following questions.

Assessment – Day 2
Reflection

1. What are your greatest sustainability concerns related to the environment surrounding your school?

2. How could those concerns be addressed (e.g., school policies, government policies, neighborhood-organizing, changes in physical infrastructure)?

3. How can you, as students, be the driving force for those improvements?

4. What are possible negative consequences of the changes you proposed?

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Extension Activity

Invite 1 or more community stakeholders, such as a city planner, an environmental engineer, a member of city council, a developer, an owner of a local business, or a resident, to visit your classroom. Ask what sustainability means to them. Have students present their ideas for making their community more sustainable. Ask the invited guests to give feedback on students' ideas. Are the proposed changes feasible? Have any of these ideas been suggested before? Are there community groups already working on these issues?

Action Project

As a class, choose 1 local community issue of interest, such as health care. Identify and map resources related to this issue in your community (for health care, resources might include pharmacies, hospitals, and medical clinics), and explore the implications of where existing resources are located. Use Google Maps (**maps.google.com**) to identify particular kinds of resources in a given area. How is the surrounding area affected? How is the entire community affected by the location of a resource? Generate ideas for enhancing existing resources, indicating on a community map where these enhancements should be located. Work with a neighborhood association or the city planner's office to make the class's vision come to life.

Additional Resources
Book

Outside Lies Magic, John Stilgoe, Walker & Company, 1999. This book encourages readers to explore their built environment and discover its secrets, how it came to be, and how it affects their lives.

Websites

- **www.planning.org** – The American Planning Association (APA) is a nonprofit public interest and research organization committed to urban, suburban, regional, and rural planning. On their site you will find information for professional planners, educators, and students about community planning. They also publish ResourcesZine, an online newsletter with feature articles and ideas for involving youth in planning efforts.

- **www.epa.gov/compliance/whereyoulive/ej-tool.html** – The Environmental Justice Geographic Assessment Tool, presented by the U.S. Environmental Protection Agency, allows users to investigate links between environmental hazards and demographic features of a geographic area, such as population density, per capita income, and percent of people below the poverty line.

- **www.walkscore.com** – Walk Score provides users with a measure of how many amenities are located within walking distance of a given address. Type in any address and find nearby grocery stores, movie theaters, schools, parks, libraries, fitness facilities, and more.

7 Three Faces of Governance

Students create a sustainable national energy policy via cooperation and negotiation among the 3 faces of governance: the *State* (Government), *Civic Organizations*, and the *Private Sector*. In groups representing each of these areas, students work to accomplish their individual policy goals while negotiating and forming coalitions with other groups to strengthen their overall energy policy. Policy proposals are presented and 1 plan is selected to become a national energy policy.
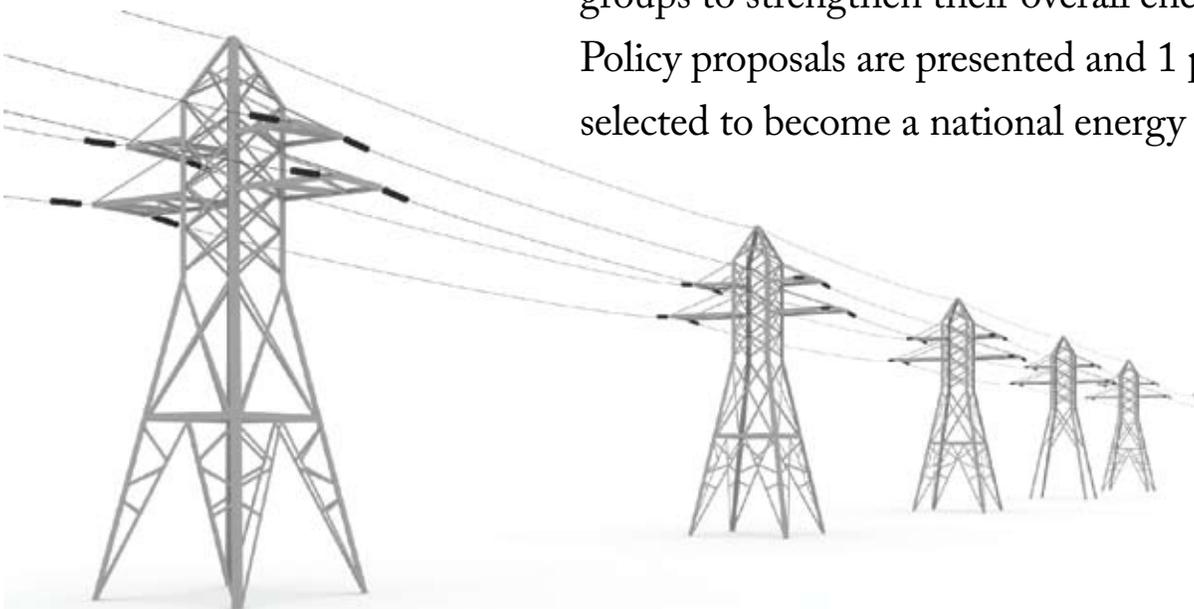
Key Concepts

- Governance and its 3 faces: the state, civic organizations, and the private sector
- Civic engagement
- Sustainable policies

Integrated Subject Areas

- Science (Earth, Environmental, Physical)

Inquiry/Critical Thinking Questions

- How are government policies determined and who has a say in creating policy?
- What considerations should be taken into account when developing energy policies?
- How are government policies connected to other global issues?

Objectives

Students will:

- Understand how the 3 parts of governance—the state (government), civic organizations, and the private sector—work together to create policy
- Experience the process of finding common interests and building coalitions with other organizations
- Recognize the difficult choices policy makers face in balancing the short- and long-term costs and benefits of their decisions
- Understand the role governance plays in other global issues

NCSS Standards and Performance Expectations for High School Addressed

- I.a. analyze and explain the ways groups, societies, and cultures address human needs and concerns
- I.b. predict how data and experiences may be interpreted by people from diverse cultural perspectives and frames of reference
- III.k. propose, compare, and evaluate alternative policies for the use of land and other resources in communities, regions, nations, and the world
- VI.a. examine persistent issues involving the rights, roles, and status of the individual in relation to the general welfare
- VI.b. explain the purpose of government and analyze how its powers are acquired, used, and justified
- VI.c. analyze and explain ideas and mechanisms to meet needs and wants of citizens, regulate territory, manage conflict, establish order and security, and balance competing conceptions of a just society

- VII.c. consider the costs and benefits to society of allocating goods and services through private and public sectors

- VII.f. compare how values and beliefs influence economic decisions in different societies

- VII.j. apply knowledge of production, distribution, and consumption in the analysis of public issues such as the allocation of health care or the consumption of energy, and devise an economic plan for accomplishing a socially desirable outcome related to that issue

- VIII.f. formulate strategies and develop policies for influencing public discussions associated with technology-society issues, such as the greenhouse effect

- IX.d. analyze the causes, consequences, and possible solutions to persistent contemporary and emerging global issues, such as health, security, resource allocation, economic development, and environmental quality

- X.b. identify, analyze, interpret, and evaluate sources and examples of citizens' rights and responsibilities

- X.c. locate, access, analyze, organize, synthesize, evaluate, and apply information about selected public issues—identifying, describing, and evaluating multiple points of view

- X.d. practice forms of civic discussion

and participation consistent with the ideals of citizens in a democratic republic

- X.e. analyze and evaluate the influence of various forms of citizen action on public policy

- X.f. analyze a variety of public policies and issues from the perspective of formal and informal political actors

- X.i. construct a policy statement and an action plan to achieve one or more goals related to an issue of public concern

Vocabulary

- **policy** – A plan of action for tackling political issues that is often initiated by a political party in government.

- **governance** – The exercise of economic, political, and administrative authority to manage a country's affairs at all levels. Governance is a process through which people and groups exercise their citizenship. There are 3 interconnected parts of governance: the state (government), the private sector, and civic organizations.

- **the state (government)** – The sector of governance that includes elected officials, government agencies, and associated rules, regulations, laws, conventions, and policies of government at the local, state, and federal level.

- **private sector** – The sector of a nation's

economy that consists of business and professionals who trade products and services for income and profit.

- **civic organizations** – Community groups and nongovernmental organizations (NGOs) who work on a broad range of issues that affect a community. The Sierra Club, Amnesty International, and the Boy Scouts of America are examples of civic organizations.

- **coalition** – An organized group of people, often from different factions, in a community working toward a common goal. A coalition can have individual, group, institutional, community, and public policy goals.

- **subsidy** – A direct (e.g., money) or indirect (e.g., tax break) payment from the government to businesses, citizens, or institutions to encourage something that the government believes is desirable.

Materials/Preparation

- Overhead: *Questions for Energy Policy*
- Handout: *Policy Position Cards*, 1 copy

per class, cut into cards

- Handout: *Strategy Worksheet,* 8 copies per class (1 per group)

- 8 large (legal size) pieces of blank paper, and colored pens or pencils

- Blank name tags, 1 per student

- Prior to class, on paper, divide the students into groups according to the chart below.

Activity
Introduction

1. (Optional) Do a 1-minute free-write response to the following statement: "*Once people have elected their political leaders, there is not much else they can do to participate in the governing of their country.*"

2. If students are not familiar with the vocabulary words above, introduce the terms and definitions.

Steps

1. Tell the class they are going to draft a policy that will determine the future of

The State (Government)	Civic Organizations	Private Sector
President: Teacher **Environmental Protection Agency:** 2 students **Department of Energy:** 2 students	**Friends of the Environment:** 3-4 students **Citizens for Economic Growth:** 3-4 students **Rural Homeowners Association:** 3-4 students	**Coal industry:** 3-4 students **Nuclear power industry:** 3-4 students **Wind power industry:** 3-4 students

national energy production. Some of the students will represent the interests of the private sector, some of them will represent different civic organizations, and some will represent the state (government).

2. Write the 8 group names specified in the Materials/Preparation section above on the board.

3. Arrange students into the 8 groups according to the suggested numbers above. Have each group assign a note-taker and a reporter. Pass out the *Policy Position Cards* to each group (1 per group), name tags, a large piece of paper, and pens. Have each student write the name of their group on a name tag and attach to their shirt. You may want to ask each group to briefly describe the energy source or citizens they represent, to make sure that everyone has a basic understanding of what each group represents.

4. Give groups a couple of minutes to create a sign with a logo that represents their group. Have them tape the signs up in their group's area.

5. Begin the meeting by thanking the groups for coming to this important meeting, and read the following statement:

   I'd like to welcome you and thank you for coming to this important meeting. As you may be aware, the economy of our nation is growing rapidly. As President, I have decided that we need a plan that will assure a steady supply of energy to sustain our growth. I have invited representatives from civic organizations and the private sector to participate in the planning process, along with officials from the Environmental Protection Agency and Department of Energy. I hope the final plan that I select will provide for plentiful energy, while also considering environmental and quality of life concerns. Your job today will be to recommend to me a sustainable energy plan for our country. I will give more consideration to a plan that includes the widest number of interests and points of view.

6. Show and go over the *Questions for Energy Policy* overhead. The position cards contain that group's position on each of the issues. However, these may be compromised during negotiations to produce an energy plan with broad support.

7. Pass out and go over the *Strategy Worksheet* (1 per group). Tell students this will be used to help them form their strategy, and to identify potential allies, obstacles, and points of negotiation.

8. Give them about 10 minutes to complete the worksheet. Circulate and help groups that are having difficulty.

9. Next, tell the students they will have 10

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minutes to form coalitions with other groups that will agree to submit a plan together and negotiate on the 4 issues required in the energy plan. Remind them that plans that are supported by more groups will get more consideration from you, especially plans that include a broad range of interests. They can belong to more than 1 coalition, and have their interests represented in more than 1 plan. They cannot talk to you directly during negotiations, but can discuss their ideas with the Environmental Protection Agency and Department of Energy.

10. Be sure to circulate during the exercise and make sure students are participating and reaching out to other groups to negotiate and form coalitions. Encourage students to speak with groups that would not appear to be likely partners, and try to find 1 or 2 issues they might agree on. Encourage students in the government department groups to sit in on negotiations and get their interests heard as well. Do not let groups lobby you directly during the exercise. Tell them to talk to your government department staffers.

11. About 7-8 minutes through the exercise, announce that you are going to hold a cabinet meeting with your Environmental Protection Agency and Department of Energy. If there is anything the groups want to get across to the President, they should tell the department staffers right away.

12. Call over the students in the Environmental Protection Agency and Department of Energy groups and tell the rest of the groups to continue negotiating while you meet. Meet with the Department groups for 1-2 minutes and take notes on which groups they have spoken with, and their opinions on which groups they think have good ideas. You will reference this when making your final policy decision at the end of the exercise.

13. Call attention to the entire class and instruct groups to gather together in their coalitions, or get together with their original group if they did not form a coalition. If a group is part of more than 1 coalition, have them split their members between the coalitions.

14. Tell the coalitions (newly formed groups) that they now have about 5 minutes to finalize their plan and complete question #5 on their strategy worksheet, and choose a representative to present the plan.

15. Call the meeting to order and ask the representative from each coalition to present their plan, going through their proposal for each of the 4 issues on the *Policy Position Cards*. During the

presentation, you may want to ask the group these questions:

- What could be some of the negative side effects of the plan (e.g., pollution, high cost to consumers)?
- Is this plan affordable?
- Is this plan sustainable? (i.e., Will the plan meet the needs of people today and ensure that the needs of future generations will also be met? How does it affect the environment, the economy, and society?)

16. After all the coalitions have presented, choose the plan to be submitted to the legislature and explain your reasoning behind the choice to the class. The following can be reasons for choosing a plan, and will also prompt a good follow up discussion:

- The plan with the broadest support
- The plan that seems most sustainable over time
- The plan that can be implemented most quickly and inexpensively
- The plan recommended by your Department staffers

17. Bring the class back together for reflection questions.

Assessment
Reflection

1. Who will benefit from this policy? Who, if anyone, will be burdened?

2. Do governments have a responsibility to represent long-term interests (such as future environmental damage and impacts on future generations) when creating policies?

3. Did you find yourself seriously compromising your interests so you would not be left out of a coalition? Were some members of the group more willing to compromise than others? How did you resolve differences within the group?

4. What could be some of the consequences of a policy that is created without any input from either the private sector or civic organizations?

5. What do you think groups can do to influence policy if they are left out of the formal planning process (e.g., go to the media, arrange protests/rallies, sue in court)?

6. Do you feel that your real political representatives represent your concerns? Why or why not? What do you think you can do to get your interests heard by lawmakers?

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Homework

Read Student Reading 4, *What Is Good Governance?*

Action Project

Organize a voter registration campaign. Even if you are not old enough to vote, you can send a message to others about the importance of voting by helping them register. Contact your local library, city hall, or your state Secretary of State for information on voter registration.

Additional Resources
Websites

- **www.iog.ca** – The Institute on Governance (IOG) is a nonprofit organization founded to promote good governance.

- **www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.asp** – This United Nations article, "What is Good Governance?", lays out 8 characteristics of effective governance.

Questions for Energy Policy

- How will energy be produced?

- Where will energy production facilities be located?

- What should be done about pollution from the energy source?

- How will the energy facility be paid for?

Three Faces of Governance Policy Position Cards

Environmental Protection Agency

- Energy should be produced in the way that is least harmful to the environment
- Energy facilities should be located away from water sources and natural habitats
- Energy facilities should be state-regulated to prevent pollution
- Coal and nuclear industries should pay the costs of developing their facilities but the government should give subsidies to wind power, since it is less harmful to the environment

Department of Energy

- Energy should be produced in the most affordable and quickest way possible
- Energy facilities should be located in both rural and urban areas
- The energy industry should voluntarily agree to pollute as little as possible
- Energy facilities that can produce the most power quickly and cheaply—primarily coal burning plants—are more likely to be subsidized by the government

Friends of the Environment

- Energy should be produced in a way that is least harmful to the environment
- Energy facilities that generate pollution should be located away from water sources and should not destroy natural habitats
- The energy industry should be heavily regulated by the state to prevent pollution
- The government should offer subsidies to the wind power industry and not offer any subsidies to the coal and nuclear industries

Citizens for Economic Growth

- Energy should be produced in a way that is most affordable for businesses and consumers
- Energy facilities should be located wherever land is most affordable
- The energy industry should voluntarily agree to pollute as little as possible
- Energy facilities should pay for themselves, but some government subsidies are acceptable if they lead to cheap and plentiful energy for consumers and businesses

Rural Homeowners Association

- Energy should be produced in a way that is low-cost to rural families and does not heavily damage our land
- Facilities should be located in or near cities since they use more energy
- There should be some pollution regulation, but it should not overburden the industry unnecessarily
- Rural landowners should not have to pay increased taxes for energy facilities since urban people will be using more of it

Coal Power Industry

- Coal is cheap, quick, efficient, and because of new technology, it does not produce much pollution
- We want to locate plants wherever it is most cost effective and provides enough space to build our facility
- We want to self-regulate our pollution—we don't need the state to regulate us
- We would like government subsidies, but can get by without them if we are allowed to produce the bulk of our nation's energy

Wind Power Industry

- Wind power is the cleanest energy source and the most sustainable
- We need to build plants in flat rural areas where there is a lot of wind
- We do not produce pollution, so we do not need to be regulated by the state
- We will need some government subsidies to build our facilities; however, once the facility is constructed it will generate a long-term inexpensive source of energy

Nuclear Power Industry

- Nuclear power is a clean and reliable source of energy. As coal reserves begin to run out, nuclear power is the best long-term energy solution
- We need to build our reactors in rural areas that are near water sources and open space
- We will accept some routine safety checks, but we do not need state regulation for pollution prevention because we will build our facility to the highest standards
- We need government subsidies to build our plants and dispose of and store our waste

Strategy Worksheet for Three Faces of Governance

Four Considerations for Creating a National Energy Policy

- How will energy be produced?
- Where will energy production facilities be located?
- What should be done about pollution from the energy source?
- How will the energy facility be paid for?

Group members: _____

Name of your organization/entity: _____

1. Your Position: Read your Position Card and discuss the 4 questions above. You should be able to answer each question based on the position stated on the card.

2. Potential Allies

Which other groups do you think share a similar view of what the national energy policy should be? Are there groups that may agree with you on some but not all 4 issues of the energy policy?

_____

3. Potential Obstacles

Which groups may have different views than you on what the energy policy should be? Why?

_____

4. Prioritize Objectives

Of the 4 issues in the energy policy, rank them from 1 (being most important and nonnegotiable) to 4 (being least important and willing to compromise on).

1. _____   2. _____

3. _____   4. _____

5. Final Plan (complete this <u>after</u> the negotiations)

With what group(s) have you formed a coalition? _____

  1. How will energy be produced? _____
  2. Where will energy production facilities be located? _____
  3. What should be done about pollution from the energy source? _____
  4. How will the energy facility be paid for? _____

Creating Our Future

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How do we create a just and humane world for ourselves and for future generations? Help students identify and plan what they want their future to look like. Using an action-planning model, students visualize their desired future, identify objectives, develop a plan to address local and global issues, and implement their vision through action and service learning.

Key Concepts

- Creating a vision
- Identifying local and global issues
- Action/project planning
- Personal and structural solutions

Integrated Subject Areas

- Science (Earth, Environmental, Life, Physical)

Inquiry/Critical Thinking Questions

- How do we envision and create a world we want for ourselves and for future generations?
- What unmet needs exist in our local and global communities?
- How do we identify structural solutions to local and global issues?
- How can we work together to plan a course of action?
- Whose behaviors do we need to target and what audience has the power to implement needed changes?

Objectives

Students will:

- Visualize the future they desire
- Collaborate with their peers
- Identify issues they want to address and identify and prioritize objectives
- Create an action plan for addressing a sustainability and quality of life issue
- Present their findings

NCSS Standards and Performance Expectations for High School Addressed

- II.f. apply ideas, theories, and modes of historical inquiry to analyze historical and contemporary developments, and to inform and evaluate actions concerning public policy issues
- III.g. describe and compare how people create places that reflect culture, human needs, government policy, and current values and ideals as they design and build specialized buildings, neighborhoods, shopping centers, urban centers, industrial parks, and the like
- IV.h. work independently and cooperatively within groups and institutions to accomplish goals
- V.g. analyze the extent to which groups and institutions meet individual needs

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and promote the common good in contemporary and historical settings

- VI.c. analyze and explain ideas and mechanisms to meet needs and wants of citizens, regulate territory, manage conflict, establish order and security, and balance competing conceptions of a just society

- IX.d. analyze the causes, consequences, and possible solutions to persistent contemporary, and emerging global issues, such as health, security, resource allocation, economic development, and environmental quality

- IX.h. illustrate how individual behaviors and decisions connect with global systems

- X.c. locate, access, analyze, organize, synthesize, evaluate, and apply information, about selected public issues—identifying, describing, and evaluating multiple points of view

- X.i. construct a policy statement and an action plan to achieve one or more goals related to an issue of public concern

- X.j. participate in activities to strengthen the "common good," based upon careful evaluation of possible options for citizen action

Materials/Preparation

- Handout/Overhead: *Action Planning Worksheet,* 1 per group of 3-4 students, and make an overhead

- Butcher paper, 1 sheet per group

- Color marking pens, 1 set per group

Activity
Introduction

1. Ask students to close their eyes and visualize what they *think* the world will look like 20 years from now. Have 2 or 3 students briefly describe the future as if it were a picture.

2. Now ask them what they *want* the world to look like in 20 years for themselves and for future generations (Note: you may need to explore the difference between *think* and *want* for this part of the activity). Ask, "If this is the future we want, how do we make it happen?" Explain that in order to create a world we want for ourselves and for future generations, we need to first envision what we want and then create a plan of action. This activity provides a model for doing just that.

Steps

1. Explain to students that, in order to help focus their vision of the future, it is helpful to think about specific quality of life issues that are important to them. Brainstorm and list issues of interest, including sustainability issues that the class has learned about over the past 2 weeks (these may include some of the following):

Food	**Transportation**	**Community Planning**
Water	**Education**	**Governance**
Housing	**Environment**	**Recreation**
Energy	**Security**	**Resource Consumption**
Employment	**Health Care**	**Environmental Justice**

2. (Optional) Have students do a 5 minute free-write describing their vision of the world in 20 years, addressing some or all of the quality of life issues identified in the brainstorming exercise. Give them the prompt: "In my vision of the future…." Encourage students to focus on what they want the future to be like, rather than what they do not want it to be like. For example, rather than saying, "In the future, people will not use polluting fossil fuels," say, "In the future we will use clean, renewable energy sources." Tell them to provide as much detail as possible in describing their vision. Have students read aloud 1 or 2 sentences from their free writes or have them share in pairs.

3. Explain that they will develop an "action plan" to address 1 of the quality of life issues in the list (such as food, health care, or the environment) using a model called an "Action Planning Sequence." Through this process, they will assess how the issue affects the sustainability of both local and global communities, and develop a plan to address the structural causes of the issue.

4. Give each student a copy of the handout, *Action Planning Worksheet,* and show the overhead of the same worksheet. Explain each step of the action planning process to the students, using the overhead as a guide.

5. Divide the class into groups of 3 or 4. Have each group choose a topic from the list of issues they brainstormed. Give each group a piece of butcher paper and pens.

6. Give them about 20-30 minutes to follow the steps outlined in the worksheet. They should begin by discussing and agreeing upon a shared vision for the future with regard to their particular issue.

7. After they complete the handout, have each group transfer their vision to a piece

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of butcher paper. Encourage them to be creative and include pictures, graphs, quotes, etc.

8. Have each group present their displays to the class.

9. Bring the class back together for the following reflection questions.

Assessment
Reflection

1. Does describing what you want your future to look like help you realize it? How and why is this an important step in creating a world we want?

2. How could taking action on the issue your group focused on positively impact another quality of life issue?

3. Did the action sequence process work? How could the process be improved?

4. How well did you work together in your groups? Did everyone participate? How did you make decisions?

5. Once you have taken action on an issue, it changes the dynamics of the issue by producing unintended consequences or by revealing new solutions. What can you do next to address this issue and work toward your vision?

Action Project

Research your local community's comprehensive development plan (available through the city or county planning department) and have the students compare it with their action plans. If they believe the community's plans do not match up with their vision for the future, brainstorm ways to have their voices heard.

Additional Resources
Films

- *Favela Rising*, Jeff Zimbalist and Matt Mochary, 80 minutes. Documentary film that tells the inspiring story of a man who makes his vision a reality by creating a music-centered movement for social change in the Favelas (slums) outside of Rio de Janeiro, Brazil. www.favelarising.com

- *Pay it Forward*, Mimi Leder, 2000, 123 minutes. Feature film about a young boy who attempts to make the world a better place.

- *Visions of Utopia: Experiments in Sustainable Culture*, Geoph Kozeny, 2002, 94 minutes. This documentary looks at different ways people are bringing more community into their lives and their work. http://store.ic.org/catalog/product_info.php?cPath=30&products_id=29

Book

The Complete Guide to Service Learning, Cathryn Berger Kaye, 2004. A wealth of activities, ideas, and resources to encourage service learning in K-12 and higher education. www.freespirit.com

Websites

- **www.facingthefuture.org** – On *Facing the Future*'s website you can view information, research, and website resources on service learning, plus a framework for developing service learning projects in your classroom.

- **www.simplesteps.org** – Simple Steps for "green" living are suggested by the Natural Resources Defense Council. Tips range from small, quick actions to extensive, high-impact ideas for living more lightly on Earth.

- **www.fpspi.org** – The Future Problem Solving Program International, Inc. hosts international competitions in which students are challenged to devise solutions for real-world problems.

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Creating Our Future

Action Planning Worksheet

Group members: _____

Issue you are focusing on: _____

Scope of the Issue

Who or what is currently being affected by this issue? _____

_____

How does this issue affect your local community? _____

_____

How does this issue affect the global community? _____

_____

Visualize Desired Outcome

Brainstorm, discuss, and write a summary of the desired outcome for your specific issue.

_____

_____

_____

Use History as a Model

How has a community, in the past and/or today, successfully or unsuccessfully addressed your issue? Are there examples that you want to model your plan after, or ones that you want to avoid?

_____

_____

Gather Companions

What is already being done to effect change on this issue? Brainstorm, discuss, and list the people and organizations that are involved in the decision-making processes of this issue. Which, if any, share a similar vision and can help you meet your vision?

_____

_____

_____

Creating Our Future

Action Planning Worksheet (page 2)

Identify and Prioritize Objectives

What are actions or structures that would support your vision? For example, if your vision is "full access to health care for all people," then the objectives might be more doctors per person, more clinics in poor neighborhoods, or more reproductive health care. Discuss, list, and prioritize 3 objectives that will support your vision.

_____

_____

_____

Identify Obstacles

Discuss who or what might get in the way of realizing your vision. List a few potential obstacles and include ways you might address them.

_____

_____

_____

Identify Resources

What resources will you need to get your vision going: information, money, time, assistance from a particular group or person, or other resources? How will you use these resources?

_____

_____

_____

Implement Action Plan and Follow Up

What steps will you take to start working on your vision? Who will be responsible for implementing each step? List the steps you will take to start implementing your vision and the person(s) responsible for each step.

_____

_____

_____

Ecological Footprint

Western brand advertisements are visible throughout the world. Here, a Coca-Cola sign is displayed in Bolivia.

Photo by Kim Rakow Bernier

Student Reading 1

Think about all the things you do in the morning before you leave your home. You may turn off your alarm clock, turn on the light, take a hot shower, put on a polyester shirt, get orange juice from the refrigerator, or make a turkey sandwich to pack for lunch. At one point or another, all of those things require **natural resources** as well as social interactions and economic exchanges.

"There are many paths toward sustainability that include both personal and structural solutions.

Ecological Footprint by County Versus Total Population

- Population (in millions)
- Ecological Footprint (in million acres)

Country	Population	Footprint
United States	294	6974
China	1312	5186
India	1066	2106
France	60	832

A country's Ecological Footprint is influenced by both population and consumption patterns.

For example, making that polyester shirt took many steps. The polyester began as petroleum, perhaps drilled off the coast of Nigeria. The petroleum was transported to another country, where it was refined into usable compounds, and then processed in a third country into a material that could be used to make cloth. Along the way many people worked to create the shirt, and when it was finished you bought it at a store. Each step required a transaction between people, and energy for transportation and electricity. The energy and electricity for the transportation was likely derived from fossil fuels and contributed to climate change. The factory where the cloth was made might have polluted a local river, and the people who sewed the shirt together might not have been paid a living wage. Additionally, you may have decided to buy that shirt because it was advertised in a manner that did not disclose the possible negative consequences of its production.

And that's just a shirt! Imagine the impacts of everything we do and use in a single day.

Fortunately, there are many ways to make this impact positive rather than negative.

Ecological Footprint

In order to work toward a sustainable world – in which both we and people in the future have access to enough resources to meet our needs – we have to be aware of how our lifestyles impact the environment, our economy, and society, in both positive and negative ways. While it is often hard to accurately measure the impacts of our actions, analytical tools can help us understand and estimate our impacts. One such tool used to understand our impact on natural resources is the **ecological footprint**. We call it a footprint because it's like the mark we leave on the earth as we go about our daily activities.

So what exactly is an ecological footprint? An ecological footprint is measured in acres (one acre is about the size of a football field), and it is an estimate of the area of productive land and amount of water it takes to support

the natural resource consumption habits of a person, community, or nation.

There are two major components that affect humanity's ecological footprint: how many of us there are (population) and how each of us uses resources (consumption). These two components are affected by personal and community choices, as well as social and political processes. Stabilizing population growth and making consumption more sustainable are two interconnected and critical steps to addressing sustainability.

Population

It took about 50,000 years for the global population to reach one billion, but now it takes only fourteen years or less to increase the world's population by one billion. Demographers who study population trends project that by 2050 there will be roughly nine billion people living in the area where 6.6 billion of us live now[1].

Countries like India and China, with populations over one billion, may have large national ecological footprints. However, if you look at their per capita (or per-person) ecological footprints they are far lower than that of developed nations such as the United States or Canada. Why would this be the case? In order to understand the discrepancies between per capita ecological footprints in various countries, we must take a closer look at patterns of resource consumption around the world.

Consumption

While population in poor countries is growing faster than in wealthier nations, the average person in a wealthy country consumes far more natural resources than the average person in a poor country and thus has a much larger ecological footprint. As countries move past meeting the basic needs of their citizens and experience increases in economic development, their per capita consumption of natural resources typically increases.

Based on their culture and access to different types of goods and services, people around the world have different lifestyles and therefore varying impacts on the Earth. The average person in India has an ecological footprint of less than two acres and a person in China has a four acre footprint. By comparison, the average ecological footprint per person in France is fourteen acres, and in the U.S. it's twenty-four acres[2].

Like population growth, consumption habits are not static over time. The average

person living in the U.S. consumed 50 percent more in the year 2000 than fifty years earlier[3]. According to the U.S. Environmental Protection Agency, most of what we buy ends up in landfills.

Some of the factors driving increases in consumption rates include the media, advertising, and marketing industries. Today, the average American sees more than 3,000 ads per day[4]! And corporations are increasingly hiring advertisers to target youth. Think of all the magazines, websites, and television shows you see in a day. How many of them have advertisements? How often do advertisements disclose the potential negative social and environmental consequences associated with producing and consuming what is being advertised?

In many ways, each of us is a walking message, expressing ourselves through what we wear, how we live, and what we say. Whether we wear designer brands or make our own clothes, or use disposable or reusable cups, our choices are likely to influence the choices that others make. What message do *you* want to send?

What Can I Do?

Does all of this information mean you should make your own clothes, sell your family car, and grow all of your own food? Not necessarily. However, by being aware of the impacts created by the choices you make every day, you can better choose how big or small your ecological footprint will be. Think of that sandy beach. You could tiptoe and leave a small footprint, or take big, heavy steps.

There are many paths toward **sustainability** that include both personal and structural solutions. Here are three things that we can do to reduce our impacts on Earth's resources:

1) Choose to use and dispose of products in a manner that minimizes negative impacts on natural resources.

2) Encourage companies to produce products in a manner that minimizes pollution, conserves or recycles natural resources, fosters healthy communities, and is economically viable.

A Tale of Two Footprints

	Small Foot	Big Foot
Food	fruits, vegetables, grains, some meat	lots of processed foods and meat
Travel	by bicycle and bus	mostly by car
Home	apartment with energy-efficient appliances	large 4-bedroom house with a lawn
Recycle?	everything	nothing

3) Work toward stabilizing population through personal decisions and support efforts to increase access to education, healthcare, food, and adequate housing of people around the world.

You Are Not Alone

You may not think that your actions alone can make a difference. Think of one simple thing you could do today. Now, what if everyone in your school worked together to reduce their ecological footprint? What if schools around your country joined in the effort? And what if your efforts were joined by people all around the world? It could have a huge impact on our world.

It's your lifestyle. It's your ecological footprint. But that impact affects us all.

Vocabulary

ecological footprint – the area of the earth's productive surface that it takes to support everything a person or group of people uses

natural resources – valuable resources such as timber, oil, and metals, that occur in nature

sustainability – meeting current needs without limiting the ability of future generations to meet their needs

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[1] Population Reference Bureau, "2007 World Population Data Sheet," http://www.prb.org/pdf07/07WPDS_Eng.pdf.

[2] Based on 2003 data on footprint size, by hectares: India 0.8, China 1.6, France 5.6, U.S. 9.6. From Global Footprint Network, "Ecological Footprint and Biocapacity" (2006 Edition). http://www.footprintnetwork.org/gfn_sub.php?content=global_footprint.

[3] Betsy Taylor and Dave Tilford, "Why Consumption Matters," The Consumer Society Reader (J. Schor and D. Holt, Eds.) (2000): 467.

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Feeding the World

Excessive tillage makes soil more vulnerable to wind and water erosion.

Student Reading 2

There is an old adage, "you are what you eat." But what exactly do we eat? Do you know how your food was produced, where it came from, or who grew it? If your food came from a supermarket or restaurant, do you know what it's made of?

> ## "Hunger doesn't exist because of a lack of food.

Local farmers markets are growing in popularity. This outdoor market features organic produce and meats.

Photo by Laura Skelton

Like other activities in our lives, eating carries with it not only personal health consequences, but also environmental, social, and economic impacts that often stretch around the world. **Sustainability** means meeting our own needs without limiting the ability of future generations to meet their needs. In order to increase the sustainability of our food systems, we must consider how our choices affect people and the planet.

The challenge of feeding the human population is two-fold. We must ensure that all people can get the basic food they need and that the way we produce food is sustainable so that the systems that support all life on Earth (society, economy, and the environment) are not damaged.

Food for All?

Over the past fifty years, food production has grown faster than the rapidly growing population. There is now more food grown than ever before. Despite this increase in food production, today more than 850 million people are hungry[1]. That is, they experience recurrent, involuntary lack of access to food, which may have adverse health effects over time[2]. Most of these people live in **developing countries,** but many live in the United States. In 2006, 12.6 million households (35.5 million people) in the United States were **food insecure**[3].

Hunger, in the United States and around the world, doesn't exist because of a lack of food. In fact, food production is predicted to grow faster than population through 2030. Hunger exists because the food is not distributed equally[4]. In many cases, governments in poor and indebted countries export the crops they grow in order to pay off debts to other countries or banks instead of using it to feed their people. Armed conflict can also lead to hunger when farmers are forced to abandon their lands. In the United States and around the world, even if food is available, many people do not have the money to buy it.

A Growing Food Supply

People have not always farmed. For thousands of years people lived as hunter-gatherers, following animal migrations and the seasonal growth of plants. During this time, population remained fairly stable—the number of people who died was about the same as the number of people who were born. Around 12,000 years ago people began to grow their own food, which allowed population to grow as well. Slowly, farming evolved to support growing civilizations around the world.

Beginning in the 1950s, agriculture—especially in developing countries—went through a transformation called the Green Revolution. Hybrid seeds, fertilizers, pesticides, new machinery, and irrigation projects began to be used around the world. These new agricultural practices and technologies dramatically increased crop yields, helping to feed a growing world population. However, by the 1960s monocultures (fields where only one crop is grown) and heavy dependence on chemical fertilizers, pesticides, and herbicides had become ubiquitous in agricultural production worldwide.

The Dust Bowl: A Lesson of Unsustainable Land Use

The ways in which we address the challenges of feeding the human population affect not only our food consumption but also our planet, society, and economy. In the past, methods of food production have had both positive and negative impacts on human societies.

In the 1930s the Great Plains of the United States and parts of Canada experienced a severe drought and enormous dust storms, the loss of millions of acres of farm land, and massive migration westward from the Great Plains. In the dust storm of May 10, 1934, twelve million tons of dirt landed in Chicago. In 1934 there were twenty-two major dust storms, but in 1937 there were seventy-two[5]! Constant wind and periodic droughts were common in the Great Plains, so why did the Dust Bowl happen in the 1930s and not before?

Encouraged by government incentives and the dream of financial success, between 1862 and the 1920s, people flocked to the Great Plains to set up farms. The invention of the tractor enabled people to farm much larger tracts of land than before, and farmers were encouraged to produce as much as possible, even if there was already plenty of food in the United States. The farming techniques that most farmers used increased erosion. By tilling native grassland to create fields and plant crops, farmers pulled out the support system that held soil in place during dry windy periods. During the drought of the 1930s, topsoil dried out from lack of rain and strong winds blew it off the fields[6]. With their crops and fields ruined, and little hope for local employment amidst the Great Depression, more than 400,000 people migrated West in search of migrant farm labor jobs[7].

The tragic experience of the Dust Bowl changed the way that many people in the United States thought about the relationship between humans and the environment.

Hillside terraces like these at the ancient Inca settlement of Wiñaywayna in Peru allow cultivation in marginal environments.

Photo by Kim Rakow Bernier

The United States government began looking at the environment as interconnected systems rather than isolated features. For example, when assessing the farming potential of land, government officials began to take into consideration soil, vegetation, and climate, as opposed to simply rainfall[8].

Learning from the Past, Farming for the Future

Farmers around the world are using farming techniques that have been proven to protect the health of the soil, environment, and economy. This type of food production is often called sustainable agriculture. While the label "sustainable agriculture" is a relatively new term, many sustainable farming techniques are thousands of years old and continue to work today. For example, some Native American groups in North America developed detailed understandings of their local ecosystems over thousands of years that enabled them to grow food crops.

On the other side of the planet, native farmers in Papua New Guinea figured out methods to adequately farm in an extremely wet climate (more than 400 inches of rain per year), steep terrain, earthquakes, and landslides. To successfully produce food under these conditions, they often dug ditches around their crops to protect them from flooding, used organic waste as fertilizer and mulch, rotated crops, and terraced the land[9].

We can learn from these farmers' successes and incorporate new technologies to continue to grow, or support those who grow, enough food for everyone without continuing to damage the systems that support all life on Earth.

Modern Sustainable Agriculture

Sustainable agriculture can reduce soil erosion through reduced tillage. In some cases, crops may be planted without first plowing the soil, thereby reducing soil erosion. Crop rotation is another sustain-

able agriculture technique. By not planting the same crop year after year in the same field, farmers are able to keep the soil full of nutrients and minerals for future crops. A third sustainable farming technique is to water crops more efficiently using techniques like drip irrigation that use only enough water for the crops to grow. Sustainable agriculture can take many forms, but it has five key outcomes:

- Preserves the quality of air, water, and soil

- Provides farmers and their families with a reliable income

- Works to ensure that everyone has access to healthy food

- Strengthens communities

- Can be continued for generations

Organic farming is one form of environmentally sustainable agriculture. Instead of killing weeds and pests with man-made chemicals, organic farming uses other methods to fight pests. Some organic farmers work to increase numbers of predator insects like ladybugs that eat pest insects. Organic farmers often use decayed plant material (called compost) and animal manure to provide important nutrients that plants need to grow. This reduces poisonous pesticide runoff common with chemical fertilizers.

Farms that sell their products exclusively to local markets can help strengthen local economies, communities, and reduce agriculture's negative impact on climate change. By reducing the amount of transporta-tion of a product, we reduce the amount of **greenhouse gases** associated with its production and consumption. And when farmers sell their products in their local markets, money is kept within the local economy as opposed to going to a producer elsewhere. Thus, it can be reinvested (by the farmer) locally to benefit the community.

Additionally, urban agriculture, community gardens, and backyard farms can be high-yielding sources of food for families and neighborhoods. These sources of produce not only help strengthen communities, economies, and reduce agriculture-induced climate change; they also provide hands-on learning experiences for students and adults. Some schools in the U.S. have school gardens which serve as sources of community growth, education, and fresh produce.

Food is a part of everyone's life, and the production of food is intimately related to the continued existence of our society, economy, and environment. The choices we make about what we eat can have huge impacts on the planet. Citizens, communities, and countries around the globe are working to make our food production systems sustainable through organic farming, community gardens, new technologies, and other methods of sustainable agriculture. By making informed choices about our food—whether we buy local, organic, or grow our own produce—we too can take action and help to ensure that the human population will have enough food to eat for generations to come.

Vocabulary

developing country – the United Nations' term for those countries with a low average per-person income

food security – the condition of all people having continued access to enough food for an active, healthy life for all household members

greenhouse gases – gases such as carbon dioxide and methane that accumulate in the atmosphere and contribute to global warming

sustainability – meeting our own needs without limiting the ability of future generations to meet their needs

Checking for Understanding

1. When you go to a store, what type of food costs the least? Why do you think this is the case?

2. What is one way we can ensure everyone has access to healthy food? How might we implement this strategy?

3. In what ways is sustainable agriculture connected to social and economic well-being?

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[6]Worster, 5.

[7]"The Great Depression and World War II, 1929-1945." The Library of Congress. September 22, 2002. http://memory.loc.gov/learn/features/timeline/depwwii/dustbowl/dustbowl.html

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Urban and Community Planning

Student Reading

3

What does it mean for a city to

be sustainable? A sustainable city has economic, environmental, and social policies that enable its citizens and visitors to use resources in a way that ensures people can meet their basic needs well into the future. Features of a sustainable city might include low-cost, energy-efficient, and easily

> "Most population growth will occur in cities as a result of births and immigration.
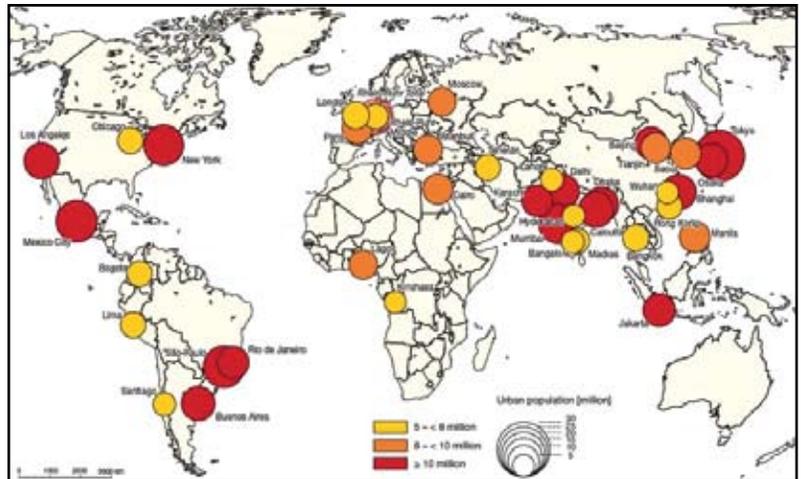
accessible public transportation systems; extensive recycling programs; environmental education in schools; energy-efficient buildings; and bike lanes on streets. Does your neighborhood have any of these features? What are some features of your community that encourage **sustainability**?

The Growth of Cities

In 2008 we reached a momentous milestone in human history, when the number of people living in **urban** areas surpassed the number living in **rural** areas. While many people will continue to live in rural areas, most population growth will occur in cities as a result of births and migration. The most rapid urbanization is occurring in less developed nations.

Today there are nineteen so-called "megacities" with populations of over 10 million people each. More than half of these megacities are in Asia. Eight new megacities are expected to emerge by 2025, with the

largest increase occurring in Asia. With a population of 36 million, Tokyo is the most populous city in the world[1].

Between 2005 and 2050, just eight countries are expected to contribute to half of the world's population increase: India, Nigeria, Pakistan, the Democratic Republic of Congo, Ethiopia, the U.S., Bangladesh, and China[2].

Global and Local Impact

While cities are often hubs of economic activity and cultural attractions such as performing arts, they also face many challenges to sustainability such as pollution, poverty, and crime. With millions of vehicles, plus numerous air-conditioned and heated buildings, and few large green areas with trees to absorb the carbon dioxide they send into the atmosphere, cities have a large impact on the environment.

With **exponentially growing** populations, and many environmental and social chal-

Shown are the world's largest cities. In 2000, there were 39 cities in the world with 5 million inhabitants or more. By 2015, that number is expected to grow to 58.

Reprinted with permission from F. Kraas, "Megacities as Global Risk Areas," Petermanns Geographische Mitteilungern, 147, 2003/4. Pp. 6-15

lenges, is it even possible for cities to work toward sustainability? Yes! Cities are areas with tremendous potential for sustainable technologies, design, and living.

Urban planning is the conscious design and organization of the buildings, infrastructure (community facilities such as streets, transportation systems, and schools), common spaces, and policies (or rules) of a town or city. The way in which we organize our space, our economic and environmental policies, and our social programs directly affects the amount of pollution and waste that we produce individually and collectively. Thus, by examining and adjusting these systems, in addition to our personal habits and lifestyles, we can produce less pollution and waste and decrease our negative impact on the environment and each other. Since cities account for much of the world's **greenhouse gas** emissions, redesigning cities can have an enormous effect on the earth.

Sustainable City Profile: Curitiba, Brazil

There are many examples of cities in which citizens are working hard to overcome social, environmental, and economic challenges to become more sustainable. One great example of a city that efficiently and inexpensively transformed itself into a more sustainable city is Curitiba, Brazil. Located in southern Brazil, Curitiba had a population of 350,000 in 1965 and today has 1.8 million people living within the city limits and another 1.4 million in neighboring areas. Beginning in the 1970s and continuing today, Curitiba underwent a series of cost-

efficient public works projects with the goal of creating a city that was built for people, not cars.

The efficient and sustainable features of Curitiba were carefully planned. The original idea for the sustainable city came about as a response to a proposal to widen the streets of Curitiba and create a highway through its historic center in an effort to alleviate car congestion. As an alternative to the highway construction, an urban planner and architect named Jaime Lerner and his colleagues wanted to make a livable city that was centered around people, families, and community, rather than cars. Their first project took place in 1972, just after Jaime Lerner became mayor of Curitiba. They converted six blocks of a main city street into a pedestrian-only area in only three days! The shop owners along the newly remodeled stretch of road were initially skeptical of the plan because they thought it would diminish their business. But within a couple of days business was booming and nearly every shop owner experienced record sales. Soon after, other business owners wanted their streets converted to pedestrian-only walkways. Over a few years, the pedestrian-only area was expanded to encompass more than sixteen blocks in downtown Curitiba[3].

Public Transportation

Lerner and his colleagues went on to design an energy- and cost-efficient bus system. Without major renovations or loss of buildings, they reorganized the streets in Curitiba to make a series of bus-only express

> "Cities are areas with tremendous potential for sustainable technologies, design, and living.

lanes with car avenues on separate streets. According to Lerner, the bus system was 500 times cheaper than installing a subway system and 100 times cheaper than installing an above ground train system[4]. When it was first created, the bus system could transport 54,000 passengers a day. During the 1990s the city made changes to decrease the time it took passengers to get on and off the buses and increase the number of passengers the system could transport. These changes included adding sliding subway-like doors on all the buses, changing the method of payment to mimic that of a subway, creating raised boarding platforms at bus stops, and increasing the size of their buses to hold more than 200 passengers at a time. With these improvements, and the expansion of the bus system to neighboring communities, the Curitiba bus system now transports 2.3 million passengers per day. And, because of the incredible public transportation system, inhabitants of Curitiba use 25 percent less gas per person than the average Brazilian[5].

Waste Management

With only one local landfill, Curitiba has limited access to landfill space. In 1989 the government of Curitiba created a voluntary recycling program aimed at encouraging people to minimize the amount of waste they threw in the garbage destined for the local landfill. A recycling education program began in schools, and students in turn brought the information home. Today, city residents recycle more than one-third of their garbage—far higher than the national average for Brazil, not to mention the rest of the world[6].

Parks and Public Places

During his terms as mayor, Lerner also created a dozen parks. The parks simultaneously provide recreational space for people, extract carbon dioxide from the atmosphere, and absorb flood waters through a series of small man-made lakes that strengthen the

Curitiba bus stop
Photo by Carlos E. Restrepo

drainage systems. The grass in the parks is "mowed" by a municipal flock of sheep, rather than a mechanical lawn mower. Lerner also oversaw the creation of other public spaces such as the Free University of the Environment (an institution that educates the public on environmental issues), an opera house, and a botanical garden. All three areas were constructed quickly (sometimes in less than two months!) and entirely from recycled materials such as telephone poles and metal tubing[7]. In addition to structures being made from recycled materials, many buildings in Curitiba are actually recycled in their entirety. For example, the gunpowder depot was converted into a theater[8] and old buses are transformed into information booths and child care centers where people can leave their children while they shop[9]. The city has a priority for making public services easily accessible and publicized to all citizens. Public service resources like the offices for the housing administration, post office, and police are all located next to one another in areas that are also public transportation hubs[10].

A Role Model for Cities around the World

Curitiba continues to be a role model to many cities. For example, the rapid bus system in Bogotá, Colombia, was inspired by that of Curitiba, and other cities have goals to implement recycling and transportation programs like Curitiba has. With an annual city budget of $650 million, Curitiba creates and maintains a sustainable city for a fraction of the cost that many American cities spend on city programs and maintenance in a year. At the core of city planning in Curitiba lies a strong partnership between citizens from all walks of life—taxi drivers, architects, teachers, students, business people—and city government officials. The city government aims to include as many citizens as possible in the process of creating new policies and programs. For example, students like you might have a class project in which they measure water levels and attributes of the city's rivers and lakes and then report the findings to City Hall[11].

How do you envision your community or city 10, 50, or 100 years from now?

Vocabulary

exponential growth – a constant rate of growth applied to a continuously growing base over time; a larger initial population size leads to a larger increase in population

greenhouse gas emissions – specific gases such as carbon dioxide that accumulate in the atmosphere and lead to warmer temperatures on Earth's surface

rural – pertaining to the country; outside of a city

urban – pertaining to a city

sustainability – meeting current needs without limiting the ability of future generations to meet their needs

Checking for Understanding

1. What features from the Curitiba story, if any, would you like to see in your community?

2. What is one system in your community that is *not* sustainable?

3. What steps could you take to make this system more sustainable?

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[2] UN DESA, Population Division, "World Population Prospects: The 2006 Revision." www.un.org/esa/population/publications/wpp2006/wpp2006.htm

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[10] Carmen Vidal-Hallett and Mark Hallett, "Sustainability in the Big City: What Chicago can learn from Curitiba," Forward: The Quarterly Journal of the National Associates Committee, The American Institute of Architects, April 24, 2008. http://www.aia.org/nwsltr_nacq.cfm?pagename=nacq_a_051013_outside_vidalhallet

[11] Vidal-Hallett and Hallett, 2008.

What Is
Good Governance?

Greenpeace volunteers install solar panels on a roof in Negros. *Photo by Kate Davison, Greenpeace Southeast Asia*

Student Reading 4

What sort of obstacles do you face in trying to lead a sustainable lifestyle? Do you have trouble breaking old habits? Are products that minimize negative environmental impacts more expensive or hard to find? How might we overcome those obstacles?

Working toward a sustainable lifestyle—consuming resources in such a way that future generations also have access to the resources they need—is not a solitary endeavor. Through effective governance—the combined efforts of government, community organizations, businesses, and citizens like you—our lives can become more socially, environmentally, and economically sustainable.

What Is Governance?

Government is defined as an official governing organization that has the power to make and enforce laws for a certain territory; governance, however, is much more. *Governance* is the exercise of economic, political, and administrative authority to manage a society's affairs at all levels. Whereas government is an entity, governance refers to a process through which people and groups voice their interests, exercise their legal rights, and mediate their differences.

Like all processes, governance can occur on multiple scales. There is neighborhood governance, city governance, state governance, national governance, and international governance. There are three interconnected and equally important parts of governance: the state, civic organizations, and the private sector. These three sectors provide avenues through which citizens can participate in shaping their local and global communities.

The State

The *state* includes political institutions such as a presidency, legislature or law-making body, and governmental institutions such as a department of defense or a

One way to become an active participant in governance is by voting for policies and politicians who share your vision for the future. *Photo by Leah Barrett*

state department of highways. In this sense, *state* is not the same as states in the U.S. like California or Maine. Just as the United States government assumes the role of the state in national governance, the United Nations (UN) is an example of cooperation among states to create international governance. The UN is the most prominent international governing body.

After its founding in 1945, the UN played a key role in the transition of many countries from colonial rule to independence in the 1950s and 1960s. Today the UN has goals ranging from improving international literacy, schooling, and health, to eradicating extreme poverty, reducing infant mortality, and promoting gender equality[1]. According to former UN Secretary-General Kofi Annan, "Good governance is perhaps the

single most important factor in eradicating poverty and promoting development."

Civic Organizations

The second part of governance is *civic organizations*, which include community groups and nongovernmental organizations (NGOs). Their work covers a broad range of issues from education, voter registration, and public health to environmental activism, arts development, and the protection of civil liberties. Civic groups often raise important questions for government agencies to consider. They can serve as watchdogs and progress indicators on the most pressing issues. Examples of civic organizations include the Rainforest Action Network, an environmental organization; Amnesty International, an organization that addresses human rights issues; and the Red Cross, a health and emergency relief organization.

The Private Sector

The third part of governance is the *private sector*, which includes businesses and industries, ranging from large companies such as Wal-Mart to small neighborhood cafés. In democratic countries, the private sector acts as the primary driver of the **economy**, exchanging goods and services and providing wages and benefits. The media—usually part of the private sector—also play an essential role in governance by enabling and influencing communication among the three elements of governance.

Effective and Ineffective Governance

Governance, like sustainability, is an ever-evolving process, not a final state of perfection or failure. All the nations of the world have components of both effective and ineffective governance.

Ideally, effective governance includes involvement from all three sectors (the state, civic organizations, and the private sector) and responsiveness from each part to the others' needs. In other words, effective governance means that stakeholders (those who are affected by governance) feel that they have a voice in matters that affect them.

Most people would agree that good governance thrives in the context of democracy. By the beginning of the twenty-first century, the majority of the world's nations involved some form of democracy in which citizens exercised their will through voting and representation in government[2]. Local and state governments tend to be more effective when they are founded on democratic principles such as the right to vote, free and fair elections, free speech and press, and economic, employment, civil, and family rights[3]. Democratization is certainly an essential part of building good governance, but it requires ongoing education, the development of government structures and institutions, and time.

Because governance is a complex and dynamic system, several root causes can lead to ineffective governance. One example of a root cause of ineffective governance is the legacy of **colonialism**. Developing countries

> "Good governance depends on engaged citizens who take action in each of the arenas of governance.

A women's group in Bangladesh meets to discuss development in their community.
©2000 Billy Howard, courtesy of CARE

that were former colonies inherited systems of governance in which citizens are not allowed to be actively involved in politics, and politicians and civil servants are not responsive to their people.

Africa provides perhaps the clearest example of the legacy of colonialism. In the latter portion of the nineteenth century, European powers divided up the African continent into their own colonies. Lasting effects of these arbitrarily created nations include governments that are ineffective due to longstanding, unresolved ethnic conflicts. Today, countries with colonial roots often have difficulty making the transition from colonial rule to more democratic forms of government. They can be subject to government corruption, as well as civil war.

Ineffective governance impacts the **quality of life** of everyone in a country and hinders a society from having a sustainable lifestyle. Ineffective governance can result in diminishing food and water security, depletion of natural resources, lack of personal safety, poor health and education services, **human rights** abuses, and war.

However, there are numerous examples of good, effective governance throughout the world. When the state, civil society, and the private sector work together to enable and empower citizens to speak up and take action, positive change and effective governance thrive. The following three examples illustrate effective governance in action.

Renewable Energy in the Philippines

In 1998, when a U.S. company proposed building a large coal-fired power plant in Negros, a province in the Philippines, local non-governmental organizations (NGOs), businesses, and the community were outraged. They argued that a coal-fired power plant would cause noise, air pollution, and environmental degradation, and would endanger workers' health and well-being. They rallied their government through public demonstrations, press statements, and resolutions.

In 2002 the Philippine government responded by withdrawing plans to build the power plant. Negros has taken a lead in

promoting and implementing clean power sources in the region, including the construction of wind-powered energy plants throughout the Philippines. Negros's victory is a prime example of good governance—citizen involvement and government responsiveness resulting in a positive outcome[4].

The Civil Rights Movement in the United States

The U.S. civil rights movement of the 1950s and 1960s united powerful civic organizations and impassioned citizens in nonviolent protest and activism against racial injustice. This ultimately resulted in the 1964 Civil Rights Act, which enforced the constitutional right of all citizens to vote, regardless of race, provided legal relief against discrimination in public places, protected constitutional rights in public facilities and public education, and prevented discrimination in federally assisted programs.

The tradition of civil rights legislation continued with the Age Discrimination in Employment Act of 1967, the Americans with Disabilities Act of 1990, and the 1991 Civil Rights Act. The struggle for social and racial justice is ongoing, and today there are many organizations that continue to work towards eliminating injustice.

Porto Alegre's Decentralized Budget Process[5]

How would you and your neighbors like to spend $200 million? Beginning in 1989, residents of Porto Alegre, Brazil, undertook a bold experiment in improving governance through an experiment in decentralization that involved all three major components of governance: the state, civic organizations, and the private sector.

Normally, citizens pay taxes and the government decides how money is spent. In this case, the citizens of Porto Alegre decided how the city would budget the public money. This process began with dozens of meetings across the city that aimed to include many citizens who experienced discrimination in Brazilian life: middle class citizens, the poor, those with little education, and black residents. Each meeting attracted more than 1,000 residents to address topics such as transportation, health, education, sports, and economic development.

In the first 12 years of the project, the benefits were numerous and impressive:

- Homes with running and treated fresh water increased from 75 percent to 99 percent.

- The number of public schools increased from twenty-nine to eighty-six, and literacy reached 98 percent.

- Government corruption virtually disappeared.

Personal Solutions for Good Governance

Good governance depends on engaged citizens who take action in each of the arenas of governance. Below are some ways that you can help create good governance.

- Follow domestic and international current events through a variety of media: television, radio, Internet, newspapers, and magazines.

- Be active in a civic organization or school group that addresses an issue you are passionate about.

- Pursue opportunities to gain hands-on experience in politics. Run for school office. Meet with school administrators to voice your opinions and ideas. Be a student repre-sentative to parent and community organizations.

- When you are old enough, register to vote—and, most important, vote!

- Support companies that have business practices that reflect your social and environmental values.

Vocabulary

colonialism – a system of domination of one group of people by another, such as in the former British colonies of Africa and elsewhere

economy – the system of production, distribution, and consumption of goods and services

human rights – the basic rights and freedoms to which all humans are entitled; often held to include the right to life and liberty, freedom of thought and expression, and equality before the law

quality of life – the level of well-being and physical conditions in which people live

Checking for Understanding

1. What are the qualities of effective governance?

2. What is one example of how governance affects sustainability in the city where you live?

3. What, if anything, could the United States do to better promote effective governance domestically and abroad?

[1] United Nations, Millennium Development Goals, http://www.un.org/millenniumgoals/.

[2] Robertson Work, "Overview of Decentralization Worldwide: A Stepping Stone to Improved Governance and Human Development," United Nations Development Program, 2002, http://www.undp.org/governance/docs/DLGUD_Pub_overview-decentralisation-worldwide-paper.pdf.

[3] Office of the High Commissioner for Human Rights, "Universal Declaration of Human Rights," United Nations, http://www.unhchr.ch/udhr/.

[4] Philippine-European Solidarity Centre, "Campaign Against the Coal-fired Power Plant in Negros Occidental: A Project Brief," http://www.philsol.nl/A99b/NACP-brief-aug99.htm; and Greenpeace International News, "Victory: Dirty energy dies in Philippines," August 6, 2002, http://www.greenpeace.org/international/news/dirty-energy-dies-in-the-phili#.

[5] David Lewit, "Porto Alegre's Budget—Of, By, and For the People," YES! magazine, 24 (Winter 2003): 21–22.

What Is Sustainability Anyway?
Student Pre- and Post-Assessment

Name _____

Multiple Choice

Circle the letter of the correct answer(s). If more than one answer is correct, circle all correct answers.

1. Which of the following is not one of the three pillars of sustainability?

    a. Environmental health
    b. Economic prosperity
    c. Social well-being
    d. Emotional stability

2. Which of the following are concerns related to sustainable food systems?

    a. Availability of healthy food for everyone
    b. Farming that does not destroy soil and water resources
    c. Fair wages for farm workers

3. Good governance includes participation from which of the three following groups?

    a. The state
    b. Technology
    c. Civic groups
    d. Education
    e. The private sector

4. Which two of the following are major components of an ecological footprint?

    a. Population
    b. Poverty
    c. Geographic location
    d. Consumption
    e. Media influence

Short Answer

5. When you read the word *sustainability*, what is the first thing that comes to your mind?

    _____

6. Which kinds of nations do you think have the largest per-person impact on Earth's resources, developed countries or developing countries? Why?

    _____

7. Does reducing your ecological footprint mean decreasing your quality of life? Why or why not?

    _____

8. What is one structural solution (changing a system rather than acting alone as an individual) to a modern sustainability challenge?

    _____

9. What kinds of things have contributed to collapses of past civilizations?

    _____

10. List three actions that might decrease the sustainability of a community.

    _____

What Is Sustainability Anyway?
Student Pre- and Post-Assessment
TEACHER MASTER

1. d

2. a, b, and c

3. a, c, and e

4. a and d

5. *Sustainability* means meeting current needs without limiting the ability of future generations to meet their needs.

6. In general, wealthier developed countries have the largest impact on Earth's resources – for example, resource consumption per capita in North America, Europe, and Australia is much higher than in Latin America, Asia, and Africa.

7. Not necessarily – many people argue that reduced consumption of material resources can actually improve quality of life.

8. There are many possibilities, including government policies and international efforts.

9. There are many possibilities, including environmental damage and conflict among groups.

10. There are many possibilities, including activities that pollute air or water and policies that improve life for some people at the expense of others.