

## Generating Global Grassroots for Going Green

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### INTRODUCTION

Pulling up to a stop light next to a green Waste Management truck, I noticed that the vehicle's driver was outfitted in a green jump suit touting a green sleeve patch indicating the eco-friendly focus of the sanitary landfill business. Just for emphasis, the truck also promoted Waste Management's new image with a large sign on the driver's door: "Think Green." How strange, I thought, given the past business practices of the sanitary landfill industry (dig a hole in the ground, dump all sorts of toxic garbage, and then cover it with dirt) which spent years polluting underground water supplies, contaminating soil, producing air pollution, and encouraging environmentally wasteful and ecologically harmful practices. Per the Waste Management truck, apparently the sanitary landfill industry has evaluated the mountains of evidence and has arrived at the conclusion that to serve the interest of future generations, they need to alter their business practices paradigm to comply with a practice of conserving environmental resources rather than exploiting it to gain a profit.

As a social studies teacher, I, too, am confronted with instructional/learner challenges in communicating the compelling evidence of the declining state of the earth's environment. Simply stated, should the goal of sustaining our environment become a power objective, guiding each academic discipline in training tomorrow's citizen to rethink his/her use of natural resources? In addition, as a nation of consumers, can America lead the global community in creating alternatives to its over-reliance on dwindling fossil fuels? Teaching my students their responsibilities to respect natural processes and protect the environment for the benefit of future generations will be a daunting task. This is in part due to the fact that seasonal environmental changes in Houston are barely discernable; however, science informs us that cumulative effects of our mistreatment of nature are proceeding globally at a scale that projects catastrophic consequences if we do not act now.

Because the evidence of years of environmental abuse is great, a popular movement has arisen to enlighten the global community about the scale of damage that has already occurred in natural processes; this movement is often referred to as "Going Green." The purpose of this movement is to end human activities that promote wholesale abuses of nature. To achieve this goal, the movement is offering alternatives to the approach progressive society presumes toward the earth's natural resources. After years of effort (Earth Day), the rallying cry of "Going Green" has finally developed into a global brand that most people identify with sustainability and environmentally friendly practices.

Yet, what does the term "going" really mean? An anonymous pundit at ASK.com claims that "going" means "doing things little by little to help the environment." I would agree that reversing the centuries-old mindset that the environment exists for mankind's personal and corporate exploitation will take years if not generations to change. As proven in recent public forums, a dialogue on the scientific evidence concerning "Global Warming" (Kyoto Protocol) generates a great deal of denial that current scientific observations of climate change are largely due to human activities.

To avoid being trapped by reactionary inertia, elementary and secondary educators must provide a focus and impetus for change by advocating an understanding of the “Going Green” movement. This can be achieved by implementing a number of creative means using domestic and local sites as a starting point to teach the proper care and stewardship of our natural resources. As students mature and progress in their development, they can use their cumulative knowledge to participate in the support of regional and local policies that standardize air, water, and land pollution qualities.

## **OBJECTIVES**

The following objectives will serve as the learning structure for the design of the curriculum units:

**WGS.21A** - Use historical, geographic, and statistical information from a variety of primary and secondary sources (databases, field interviews, media services, and questionnaires) to pose and answer geographic questions and infer geographic relationships.

**WGS.21C** - Construct and interpret maps and other graphic representations [graphs, charts, diagrams...] to answer geographic questions, infer geographic relationships, and analyze geographic change over time in a given region.

**WGS.4C** - Explain how climate, vegetation, soil, and geology affect the distribution of plants and animals in select world regions.

**WGS.23B** - Use case studies and geographic information systems to identify contemporary geographic problems and issues and to apply geographic knowledge and skills to answer real-world questions.

**ECO.23.A** - Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions.

**GOV.9A** - Analyze the structure and functions of the legislative branch of American government, including the bicameral structure of Congress, the role of committees, the procedure for enacting laws, and the leadership structure of each house.

**GOV.23B** - Use a decision-making process to identify a situation that requires a decision, gather information, identify options, predict consequences, and take action to implement a decision.

**GOV.17C** - Express and defend a point of view on an issue of contemporary interest to a national audience that can be addressed by public policy in the United States.

## **RATIONALE**

I teach at an urban high school that features 40 different languages spoken by our student body. Coming from one of Houston’s cultural enclaves, my students approach their educational experience from a perspective of social and cultural isolation that hinders their academic development. Because most of my students are recent immigrants to America, they have settled in a Houston neighborhood that reflects the language, religion, and customs of their home country. Very few of my students’ parents (many come from single parent-homes) or themselves have much exposure to American middle class institutions or social networks. Culturally, their unique traits tend to foster group support within their own ethnic bloc and avoiding contact with those students who are not part of their ethnic group.

This social seclusion hinders many of my students' educational development in part because English is not spoken in the home and in part because their previous academic training has not equipped them with a sufficient level of confidence to attempt new learning tasks. In addition, most of my at-risk students do not have exposure to modern conservation practices nor have they

generally been taught an ecological frame of reference, much less a commitment to conservation principles. However, I view each student as able to learn about general academic concepts, including the proper care of earth's environment, if provided with the appropriate setting and suitable learning activity.

As a teacher of World Geography, Human Geography, Government, and Economics, it is my hope to use the seminar's presentations and readings to broaden my grasp of the substantive issues behind the significance of developing sustainable energy sources and reducing modern man's carbon footprint. "Going Green" topics transcend academic and political boundaries and should receive the status of primary learning objectives in order to train each student to be an ecologically-friendly citizen of the twenty-first century.

Using the lesson plans that I have created, students would be empowered to sustain a relevant discourse on the topic of local, national, and global ecologically friendly policies as they relate to addressing the current ecological crisis. The primary goal of each unit would be to instill the values of preserving conservation in the midst of growing human development and encroachment on natural processes.

Furthermore, it would be my goal to use the seminar's discussions and research to broaden my personal understanding of the broad economic, geographic, and geopolitical components of the "Going Green" issues and to incorporate these findings into viable lesson plans. The four plans that I have created are an expression of this objective.

#### **UNIT BACKGROUND**

Is there any catch phrase more popular in the twenty-first century than "going green?" Its popular elucidation allows humans across the globe to profess allegiance to its broad tenets without evoking a threat of disagreement. Yet, as "Going Green" is a concept we all want to believe in, the substance of this phrase requires that the human processes promoting social and economic development in the twenty-first century's global villages (energy accessibility and usage, clean water, cheap carbon based resources, roads and structures that contravene natural realms) be aligned with natural processes. "Going Green" as a practicing paradigm requires systemic changes in global social and economic approaches used to create the pressure to achieve an ever-increasing higher standard of living.

Where should a teacher begin in promoting student understanding of the dire straits that confront the earth's ecological existence? How can students gain insights into the fact that past human social, economic and political progress has been shaped by the modern viewpoint that the exploitation of the environment is a natural prerequisite to human development? To counter this erroneous information, one author suggests that all education must be environmental education (Orr 55). Orr's premise suggests that students must understand that they exist as part of or apart from the natural world. Accordingly, Orr believes that education is not about the mastery of subject matter; rather, the goal of education should be focused on the character skills of mastering one's person and how one lives in a finite world in a responsible manner.

Modern education coupled with pragmatic capitalism has done a poor job of teaching personal and social values that transcend the realm of one's own personhood. The "Going Green" perspective requires us to acknowledge the negative effects of capitalism upon people and the natural environment and change past behaviors to align our society's economic behaviors to be eco-friendly. Free market capitalism has not promoted equalitarian values nor provided measures that nourish the best and noblest character in the human spirit. The fact that capitalistic practices are destroying natural processes only adds to the need to impose additional regulations on the commerce that is degrading our environment and the quality of human life.

Since it is the environmental future of my students and their children that is in peril, I trust that I can create curriculum units that empower them to visualize the lifestyle changes that are needed to avoid a natural disaster of enormous proportions. In addition to understanding the environmental consequences of the exploitation and degradation of natural resources, my students need to be exposed to possible personal solutions to a growing number of environmental disasters, such as cutting down rainforests, use of chemicals and artificial hormones to grow our food supply, and the lack of available clean water for human consumption.

To realistically think about “next steps,” my students need to learn the history of governmental policies of environmental change and discover that the government does not have a good track record of moving quickly to resolve environmentally destructive issues. However, on an international front, the literature indicates that there are a number of countries who have noted the damaging effects of human-intensified use of natural resources and drafted agreements to reduce carbon emissions and other human activities that degrade natural processes. It would be beneficial for my students to study these models and make suggestions as to how America can take the lead in making the earth “green” again.

A sustainability framework already exists that suggests four system conditions that should guide interactions between human activities and natural processes. This framework is referred to as “The Natural Step,” a series of principles developed by the Swedish scientist, Dr. Karl-Henrik Robert. Karl-Henrik Robert’s “Natural Step” main thesis suggests that sustainability is fundamental to maintaining life on planet earth. According to Robert, in the past hundred years society has systemically altered life-giving natural processes and systematically substituted persistent and unnatural compounds with grave consequences to the natural environment.

Robert’s four principles underscore the essential elements in sustaining human life on earth. These principles recount that all of life is fundamentally supported by four natural system conditions. System condition one posits that substances from Earth’s crust cannot be systemically increased in nature. The focus of this principle suggests that humans need to substitute the usage of certain minerals found in nature with materials that are more abundant while using all mined materials more efficiently.

The second condition states that substances that are produced by society must not systemically increase in nature. This principle argues that human activities need to use compounds that break down more easily in nature while using all substances produced by society more efficiently. By adopting this policy of using only biodegradable products, human development’s impact on growth will lessen its damage on natural processes.

That society’s productivity should not deteriorate the diversity of nature is the third condition of Robert’s “Natural Step” system. This principle rejects the modern practices of degrading nature through over-harvesting of resources, introducing foreign agents to an eco-system and other forms of modifying natural systems. These practices should be replaced by drawing on resources from well-managed eco-systems as well as efficiently using existing resources without modifying natural processes.

Robert’s fourth condition for human development states that our natural resources must be fairly and efficiently used in meeting human needs. The global goal of reducing poverty and meeting human needs is a just and worthy objective as long as “dematerialization” measures are taken (Robert 2). Humans cannot justify consumption as an absolute goal of wealth. Natural resources should be used responsibly so that all people, including future generations, have a chance at enjoying a healthy and natural lifestyle.

The “Natural Step” processes are an excellent starting point for my students to consider in building awareness and understanding of the “whole-systems” context in addressing natural

systems. This context begins with the analysis of an organization's approach to natural systems and the impacts of an organization's entire supply chain as well as an evaluation of its “cradle to grave” existence (Robert 4). Our school’s physical plant would be a good place to begin an analysis of “Natural Step” principles.

My ninth grade students will begin by learning how humanity has exploited and degraded nature in the pursuit of human “advancement” and continues to do so. World Geography lessons will include an evaluation of the amount of natural resources used by a school or office building (energy, water, design, and construction). I will demonstrate how buildings encourage inefficient environmental practices because they act as profit centers for numerous investors and how buildings have become one of the largest sources of carbon pollution in the world (especially through its energy usage practices). A desired outcome of this lesson would be to have my students become proficient in identifying sources of building pollution and what sustainable practices exist that could replace these practices.

As an extension of this “hands-on” lesson on a building’s impact on our natural environment, I would also design lessons that combine current curricular topics of deforestation, desertification, global warming, and industrial pollution into a single unit that encourages students working in pairs to review the location where these activities are occurring and explore the impact these activities are having on the regions’ natural and personal health and prosperity. Using assorted media, I would have my World Geography students explore current environmentally-themed economic and political remedies and dialogues. This study should equip them to make class presentations discussing existing global responses to the growing evidence of environmental crisis.

The culmination of these presentations would be the drafting of personal strategies for local, national and global actions that would advance a new environmental paradigm where energy decisions are made with a commitment to conservation, compassion for living in harmony with nature, and competency in energy management rather than for profit.

To lead my students into this new paradigm, I would create learning units that use local media and resources to clearly define the “Going Green” issues. Each week I post current event articles on a bulletin board and could use this medium to discuss articles related to the “Going Green” topics. In addition I could use my bulletin board to allow students to post messages and articles they have found related to geographical, political, and economic issues addressing conservation and energy.

My senior government students need to learn how difficult it is to change long-standing policy regarding environmental issues. In addition, being exposed to the checkered past history of enforcing environmental remedies leads one to question whether the government can be a primary player in changing harmful industrial practices of exploiting the environment. I have written a lesson on “wetlands legislation” and I will recount the wetlands legislative and enforcement practices that have changed over time with the net results far short of the legislative mandate.

Using case studies, the students could write legislative scenarios and present PowerPoint presentations recounting current and past “Going Green” initiatives and discuss the political issues surrounding the transition to sustainable energy and building resources. A key focus of a lesson unit will be upon the need for grassroots action on the part of the students to suggest sustainability policies to preserve our environment for future generations. To accomplish this instructional goal, local environmental agencies and ecologically friendly businesses will be identified and involvement through volunteer action, field trips, and/or guest speakers will be encouraged.

Describing the government's regulatory powers to promote change, my students will analyze the awesome influence of the "fourth" branch of government, namely special interests, and their unwillingness to undertake considerable expense to conform to higher environmental standards. At this point in the lesson the importance of individual and local support and practices for environmentally sustainable practices will be emphasized.

Since US Government is taught the semester prior to taking Economics, I would design a class presentation on the topic of carbon "cap and trade" policies. This controversial policy has been recently debated in Congress, and a bill has already been passed in the House. This policy is designed much like the sulfur cap and trade program that has significantly addressed the acid rain problems associated with industrial air pollution.

Perhaps the most difficult hurdle for the policy of sustainability to becoming a dominant social, economic, and political guiding principle lies with the defenders of the inertia of the status quo, namely the US Congress. My senior government students study the different political structures that serve as a foundation for the civil rights we enjoy as citizens of a democratic republic. They note that Congress, especially the House, is slow to adopt new programs given the power of interest groups to impede the growth of progress, especially when an interest group perceives the threat of loss of control over industry practices they have dominated over decades. Manufacturers and other industrialists have spent years perfecting the exploitation of the environment for their personal gain and generally oppose government restrictions over the techniques used to secure their manufacturing resources. By mid-semester in my US Government course, students should understand that a change in the political paradigm will require a strong marketing campaign aimed at grassroots America which convincingly exposes the irreversible damage being done to the environment by current energy and industrial practices.

Money is power. The current economic crisis was precipitated by unwarranted faith in economic systems that were based on the acquisition of unrestrained profit which demanded minimal government regulation. The current environmental crisis was caused by an analogous self-serving viewpoint that the environment is a resource to be exploited for the gain of profit. A systemic change in both paradigms will be difficult to achieve politically and economically. In economics, students master the concept of supply and demand and study the production possibilities frontier model which demonstrates that the scarcity of resources limits the economic growth potential of a nation. Changing the world's economic practices and profit-making activities to be more ecologically friendly will be fraught with disappointments. However, as more developed nations take the lead in initiating "Going Green" food and industrial production policies, the balance of the world's nations will follow.

Since young adults learn best by engaging in lesson material, I would convey the lesson's learning objectives by using numerous learning style activities. To that end, I envision using student-led presentations, case studies, debates, and field study analysis. A class field trip to any one of a number of local Houston sites where model sustainability practices have already been implemented will serve as "live" example of what is possible and the benefits these practices generate for both the user and nature. In addition to the school's Ecology Club, perhaps there are additional venues where student involvement could teach them the significance and rewards of community service in behalf of sustaining our environment for future generations.

Encouraging both my World Geography and Economics students to engage in measuring health and prosperity against a standard of sustainability, I would lead them to understand that ecological literacy is just the beginning in grasping the irreversible damage we have already done to our natural systems (Orr 57). It may take a while for my students to develop the understanding that education in and of itself is no guarantee of decency, prudence, or wisdom, especially as related to managing planet earth's resources (Orr 53); rather, I would like them to comprehend

that all education is environmental education and that we must become personally responsible for supporting sustainable regional economies and do less damage to our local environment.

In Human Geography, my students research the spatial nature of human phenomena, including the focus of human-environment interaction. Human environment interaction has wide-spread health implications for both local and distant human settlements. My students would find it interesting that China's coal-fired power plants and factories are responsible for 25% of the polluting matter that is in the air above Los Angeles (Friedman 7). Given the global impact of unprecedented levels of CO<sub>2</sub> emissions into the atmosphere, experts are predicting that these increased levels are creating health problems, environmental degradation and lost workdays in every industrialized country (Friedman 7).

My senior economics students learn about the workings of capitalism and how it has been used as the primary economic vehicle for the advancement of human achievement. However, while the capitalistic economic system has provided wealth to a growing number of people, it nevertheless has been done at the expense of starving of the human spirit (Orr 55). Capitalism unencumbered by regulation has promoted greed and destroyed morality altogether (Orr 55). All things environmental are conceived of assets to be exploited at whatever cost, including the rape of another country's dignity and resources for the sake of profit (colonialism). However, on a positive note, the vision of natural capitalism suggests that the addition of four interlinked principles that sustain natural resources and ecosystem services can improve a corporation's bottom line (Hawken, Lovins, and Lovins). The first two of these biological principles proposes the creation of closed loops and zero waste in a building's maintenance. A third model suggests shifting the sale of goods (light bulbs) to the provision of services (illumination). The fourth natural profit center is the company's policy of reinvesting in natural capital that they use.

Acknowledging that profitability drives capitalism's policy-making, the fact that "Going Green" has the potential to mean higher profits and more productivity conceptually requires a major transformation of long-held assumptions regarding the use of natural resources. The new field of ecological economics places an economic emphasis on sustainability to replace traditional capitalistic approaches of depletion and degrading of the environment for monetary gain. In fact ecological economics is better suited to address the core economic question of scarcity. Current ecological issues of climate change, biodiversity loss, ozone depletion, and other ecological problems require that a more sustainable and environmentally sensitive economic system respond to these new scarcities (Daly and Farley 64).

The "Going Green" lesson plans that I intend to create should give an insightful perspective to my students regarding the different levels of the sustainability movement. Sustainability rather than exploitation of natural resources needs to become the operative norm. Mankind can gain unique geographic, economic, political, and social insights from observing the biomimetic designs of nature herself (Benyus). This approach to sustainability of natural resources actually encourages the design and implementation of a simpler means to accomplish the economic and technological tasks that have heretofore been achieved by the degradation of nature. Using a global lens, I will illustrate how future human activities must revert back to a more simple and conscious undertaking to restore an awesome respect and preservation of our natural environment by mimicking natural processes (Benyus).

Biomimicry precepts begin by consulting organisms to copy their physical blueprint in applying solutions to the development and support of modern infrastructures. In its biology-to-design approach the biomimicry approach echoes nature in the creation of human inventions and systems. Nature, not profit, becomes the measuring of "rightness" in the creation of our capital innovations. Not only do the principles of biomimicry offer solutions to the challenges facing eco-systems, this environmental innovation can lead to the creation of new jobs for the future. As

nanotechnology and other innovations are introduced, I hope that they will affirm that natural systems and the sustainability of natural processes are critical to the health of everyone living on Earth.

It is my contention that the "Going Green" reality will not be fully realized without redesigning our secondary school curriculum and elevating the role of learning how to sustain natural processes to a major learning objective. Each academic discipline must re-examine itself in the light of the standard of sustainability and determine where and how eco-friendly practices can be implemented to replace the exploitation of natural resources. The results of this reexamination and collective dialogues on this topic should result in interdisciplinary courses which analyze the school's resource flows and allow participation in the creation of real solutions to authentic environmental problems.

## **LESSON PLANS**

### **Lesson Plan One: Building Green (World Geography)**

#### ***Rationale:***

Buildings account for nearly 45 percent of all carbon emissions produced by the United States and are responsible for 70 percent of the nation's energy consumption (Fleishman 26). This data seems to suggest that the path to sustainability begins by investigating the energy use of the buildings we occupy. The starting point for this analysis would be a review and understanding of the LEED certification requirements and how a building's operating system (inputs) can be modified to become more eco-friendly (outputs) (Lazo 21).

#### ***Lesson Introduction:***

1. Teacher will hand out a graphic organizer on the topic of "Practical Operational Elements that Make a Building Green" to be used for note taking on the PowerPoint of the same name. A series of the PowerPoint's slides will feature the concept of LEED certification and the criterion used for its certification.
2. Students will visit an eco-friendly building in Houston which will demonstrate the sustainable use of energy which in practice reduces emissions into the environment while generating substantial operating savings for the builder's owners.
3. Upon their return to their school building, teacher-assigned groups of students will take a tour of sections of our school building taking notes on its operational practices and report their findings to the class via visuals and written analysis.

#### ***Concept Development:***

1. The growth of human population and economic activities have depleted and degraded the earth's natural resources.
2. By mimicking nature in our manufacturing and energy production processes, humanity can be more efficient and eco-friendly in the growth of human enterprises.
3. Buildings are the single largest source for carbon pollution in the world and need to undergo a thorough review of the life cycle of its operating processes to determine where the waste of natural resources can be eliminated or reduced.

#### ***Key vocabulary:***

biomimicry, sustainable, repurpose, eco-friendly, green, carbon footprint

#### ***Student Practice:***

1. The students will make their reports and begin to sort out components of the school's operating systems that can be monitored and analyzed over time.



2. Students will report their findings to the class and have them posted to other forms of available media (like Sky Power Institute, Oklahoma Sustainability Network, *etc.*) that support “building green.”

***Assessment:***

The quality of each group’s report will conform to a rubric designed to evaluate the quality of presentation, findings, and recommendations as well as how they researched the following sustainable concepts: gray water system, building water usage, usage of recycled, renewable, reusable, reclaimed, and/or locally grown building materials, lighting levels, ventilation system, green roofs, and heating and cooling systems.

***Closure:***

Students will complete a quick writing assignment on the topic “How is Lee High School eco-friendly and in what ways could we improve on meeting green standards?”

***Resources:***

1. Field Trip with LEED-driven checklist of building functions.
2. PowerPoint “Practical Operations that Make a Building Green.”

**Lesson Plan Two: The scale and spatial implications of the “Going Green” movement (Human Geography)**

***Rationale:***

People have always transformed the Earth’s land, water, and air to benefit their lifestyle. However, the magnitude of growth of the world’s population and the global economic systems has overwhelmed the ability of natural systems to recover from the scale of modern transformations. This fact is especially true in the highly industrialized (More Developed) countries that have a history of depleting scarce resources for energy production and degrading other resources through air, water, and land pollution. Without taking substantive political action, we are producing environmental problems that have long-term environmental consequences.

***Lesson Introduction:***

1. On an overhead or document reader, the teacher will show a graph detailing the rate of energy sources being consumed in the U.S. from 1860-2000.
2. Students will be asked to “Quick Write” what would happen to the quality of our daily lives if fossil fuels became depleted. After allowing ten minutes to write, students will orally present what they have written.

***Concept Development:***

1. Environmental destruction is occurring at such a rapid rate that if environmental protection policies are not in place within the next twenty years permanent environmental damage will be done and people’s standard of living will fall (Meadows *et al.*).
2. Because we do not know the environment’s capacity to assimilate a particular waste as well as the fact that many pollutants are mobile, consumers need to learn to waste less.
3. Rising levels of economic development generate increased pollution, which is evident in the rise of More Developed Countries (MDCs) of the twentieth century and an increase in polluting practices in Less Developed Countries (LDCs) as they industrialize their economies (Rubenstein 496).

***Key Vocabulary:***

animate power, inanimate power, fossil fuel, pollution, resource, sustainable development

***Student Practice:***

1. Teacher will lead the students in reading pp. 468-471 in the Rubenstein book, discussing the implications of the finiteness of fossil fuels.
2. Using a PowerPoint presentation, the teacher will present the metrics and implications of the increased depletion and pollution of our natural resources. The theme will be air pollution with its implications at the global scale of increasing the Earth's temperature and creating ozone damage, at the regional scale of acid precipitation, and at the local scale in photochemical smog and emission of particulates that are emitted from factory stacks and diesel trucks. Another form of pollution is water pollution that occurs from water-using industries, municipal sewage, and agriculture runoffs. The third type of pollution found in all industrialized countries is land pollution which comes from home (60%) and business (40%) misuse of waste products (Rubenstein 480).
3. Students will be divided into two groups to argue the merits and weaknesses of McDonald's offering paper or polystyrene foam drinking cups to their customers. Each group will access data via the Internet to support their position of paper or polystyrene cups for drinking. During a class period, both sides will debate the merits of their position.

***Assessment/closure:***

Each student will write a one page paper on the topic "Since pollution is a by-product of producing goods, how would you advise LDCs to minimize the adverse effects of pollution as they improve their levels of development?"

**Lesson Plan Three: The impact of ecological economics on the principles of capitalism. (Economics)**

***Rationale:***

Is big always best? Should each citizen of this world expect that increased economic growth is a desired outcome no matter the cost to the Earth's environment? Because everything the capitalist system produces must come from raw materials from nature, our material waste is overwhelming and degrading the life support functions of Earth's ecosystems. These issues are only a few of an ever-increasing list of grave concerns that need to be addressed by 21st century economists.

***Lesson Introduction:***

1. Teacher places on the board the statement "Increases in efficiency lead to increases in consumption, thus accelerating a resource's depletion" (Javons 156).
2. Teacher directs students to write their interpretation of this statement along with issues they can cite defending their positions.
3. After five minutes, each student turns to their shoulder partner and has three minutes to share remarks. Upon the second student sharing his/her remarks, both partners collaborate on a joint statement that reflects the main ideas of their partnership.
4. Upon completing their collaborative work, one partner will share their remarks with the class.
5. Teacher will summarize the major points of the student's remarks.

***Concept Development:***

1. The strength of capitalism as an economic system depends on the ability to consume and produce goods at increasing levels.
2. Because there is a finite amount of raw materials, all production bears an opportunity cost measured in the loss or degradation of ecological life.
3. Economic efficiency is desirable, but a sustainable scale and the just distribution of limited resources must be a focus of the capitalistic economic system.

4. In fact the economic principle of marginal utility indicates that more material consumption does not satisfy a person's wants. Ever increasing economic growth is not only harmful on finite resources, but does little to make us better off.

**Key Vocabulary:** economic efficiency, sustainability, resource scarcity, depletion

**Student Practice:**

1. Using a graphic organizer, students take notes on a PowerPoint presentation "Restoring natural capital at the local and global scale." This PPT presentation traces the origins of capitalism as an economic system and how capitalism has introduced an economic paradigm that strives for and has instilled the expectation of ever-increasing economic growth at the expense of finite natural resources.
2. At the end of the presentation the teacher will review the PPT notes with students and emphasize how complex the challenge of saving our environment has become with the growth of capitalism as the predominate global economic structure.
3. Students will be assigned groups of four to create an advertisement that describes the main elements of capitalistic use of natural resources for profit. On a second display, each group portrays perspectives of sustainability as a developing economic force.

**Assessment:** KWL chart to be completed by each student.

**Closure:** Exit ticket indicating how capitalism views natural resources.

**Lesson Plan Four: The role of government in “promoting the general welfare”(Preamble to the Constitution) while securing the economic well-being of its citizens. (US Government)**

**Rationale:**

All Americans want clean air to breathe and clean water to drink (*Promote the general welfare*). No citizen wants to fall victim to cancer because of a society ignoring the presence of carcinogenic agents in the environment and workplace. Therefore, it is the responsibility of the government to protect its citizens from the effects of these dangerous substances. One approach in addressing this problem is to restrict the sources of these agents; namely, limit the amount of carbon spewed into the environment. However simple as this idea may sound, the political reality of implementing carbon-restricting legislation is no “slam dunk.” Students need to learn to analyze the difficult role that government agencies have in balancing the "good" for general welfare without damaging the country's economic system.

**Lesson Introduction:**

1. Teacher writes on blackboard, "Privatize the profit, socialize the risk" and have students write what this phrase might mean.
2. Students "pair-share" their answers and write a consensus statement as to their meaning of this phrase.
3. Teacher requests that one of the “pair-share” students writes on the board the main ideas associated with their statement.
4. Using the words on the board, the teacher makes expanding remarks designed to draw attention to the diversity of thoughts, focusing on underlining the principle that at times the government senses its need to offer companies negative financial incentives in order to change their practices. To accomplish this goal the government first may auction or sell exemptions to their negative fines as the industries gradually adjust their practices (costly modifications) to conform to the new government standards. These costs are then passed onto the consumers of their products and over time while the products are more expensive, the

government has changed the behavior of the industry (usually for the general benefit of the public welfare).

**Concept Development:**

1. Congress represents the will of the people and is steward of 'promoting' the public's general welfare. This includes the necessity of restricting the advancement of hazardous health threats on the American people.
2. The power to tax involves the power to destroy (Justice Marshall).
3. Government is also responsible for advancing the needs of the individual while promoting what is the "common" good for the nation.

**Key Vocabulary:**

cap and trade, renewable energy, American Clean Energy and Security Act, CO2 emissions

**Student Practice:**

1. Students will be divided into four groups: 1. environmentalists, 2. consumer group, 3. representative for energy industry, 4. Politicians—Republicans and Democrats—half and half. Student groups will be given news articles providing background to this issue. These articles will be read and discussed under the supervision of the teacher. each group will be given a set of role cards that shape their remarks.
2. Each group brainstorms issues related to their position on the government passing a law (American Clean energy and Security Act) to assess a tax on industries that produce CO2 emissions. The goal of this tax is to encourage industries to reduce/limit (cap) their CO2 emissions. CO2 emissions contribute the Global Warming that is altering natural processes. The government has decided to auction (trade) five year partial exemptions (permits) from this tax, but eventually all industries will have to either cut CO2 emissions or pay a higher tax on their products. Consumer groups are aware that these vital industries will pass on these new taxes to consumers (Congressional Budget Office - \$175 a year, EPA \$80-\$100 a year).
3. Each group will select representatives who will read their group's role card in a "debate" on the merits of raising taxes or offering an alternative solution to the problem caused by CO2 emissions.

**Assessment/closure:** Quick write: "Is paying more money for gasoline and home energy worth the expense to stop Global Warming?"

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