

Contamination: Why Protect Nature ?

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The Academic Setting

Rio Grande High School

Rio Grande High School serves a predominantly low-income, Hispanic, semi-rural population (our 2,200 students are 81.4% Hispanic, 12.0% Anglo, 4.2% American-Indian, 1.9% African-American, 0.2% Asian-American, 0.3% other; 44.9% are entitled to free or reduced cost meals; 31% belong to one parent households). The community is unique in that it is historically rooted in an agrarian tradition. Students have a knowledge and understanding of the land that is uncommon to most high schoolers in the city. Most families have gardens, some livestock, and a working knowledge of the acequias (irrigation ditches). Often times, not only residents, but their ancestors have lived their entire lives in the South Valley. Furthermore, students are steeped in cultural and social traditions that remain cohesive to this day. Families are extended, individuals are rarely isolated, there is a rich tradition of food (namely chili, grown right here), music, and social, life-marking events (quincenerias, matanzas, posadas...) Students have a first-hand rich experience of the "environment," both ecological and cultural.

Unfortunately, this community which is land based and characterized by the prevalence of nature, is home to the city's sewage treatment plant, as well as three Superfund sites. It suffers from extensive groundwater contamination from septic and leaking gas tanks, dairies, and other sources. The community is afflicted by environmental injustice and is furthermore jeopardized by economic development and urban sprawl which are encroaching upon the land. Thus, the South Valley and its lifestyle are being contaminated on several fronts.

The dropout rate at RGHS is high (11.67%), test scores are low (76% score below the 40th percentile on the Gates McGinitie test) and our attendance rate is insufficient (88.4% attend school on a daily basis). Our student body is 25% special education and 88% LEP (limited English proficient.) Subsequent to a student demonstration in September 1998, which turned into a riot, in favor of teacher pay raises a process of "redesign" began at Rio Grande High School. In an effort to promote student achievement and to make the curriculum more meaningful to the students, a group of teachers have decided to base the curriculum on what students know best or at least care about: their environment, their community. The community will serve as a textbook, the foundation of the curriculum, and *will be involved in the learning process.*

Class for Which the Unit is Defined

This unit is intended for my eleventh grade English regular class which meets for

two semesters, every day, for 50 minutes. In our English department, ninth and tenth grade students are tracked into regular or honors; at the eleventh and twelfth grade a third intermediary level, called enriched, is introduced. Students who will not continue in honors (either because their grades are insufficient, or because they no longer wish to remain in honors) or students who are too advanced for regular, are placed in the enriched sections. Enriched and honors students are college bound. The focus in eleventh grade English is on American literature; students at this grade level are required to take an American history class.

Goals and Objectives of Unit

The goal of this unit is twofold: on the one hand, for students to gain an awareness and knowledge of contamination as it impacts their lives as well as the biotic community and, on the other hand, for students to gain an understanding of the loss incurred through contamination and an appreciation of nature as it exists in their daily lives as well as in the wilderness. In other words, the goal is for students to understand how and why contamination, environmental degradation alienates them from nature and can damage them as humans. The premise is that people's interaction with and experience of nature allow them to know, discover, and enjoy themselves, that such interaction basically empowers them and connects them to their roots as members of the natural environment.

More specifically, in this unit, students, through the exploration of a specific chemical contamination — a Superfund site — will reflect on the significance of contamination and the value of nature in its "uncontaminated" form (to the extent that such a concept and reality do indeed exist).

The objectives of this unit are the following:

- students will reflect on the concept and reality of contamination in their community, in New Mexico, and the Southwest.
- students will engage in a reflection about nature and articulate what nature means to them on a personal level, what it means to their families and community.
- students will gain an understanding of how nature has been perceived in the United States through a study of American literature.

Narrative

Rationale for the Unit

"To contaminate" is defined by Webster's *Seventh New Collegiate Dictionary* as, "1) to soil, stain, or infect by contact or association; 2) to make unfit for use by introduction of unwholesome or undesirable elements." Synonyms of contaminate are "taint, pollute, defile" which mean "to make impure or unclean." Furthermore, Webster specifies, "Contaminate implies intrusion of or contact with an outside source as the cause."

There are many forms of contamination in our world. Ecological contamination is one. Everybody has heard about the destruction of the rainforest, the greenhouse

effect, the depletion of the ozone layer, acid rain, air pollution, the loss of biodiversity. Each and every community across the globe has experienced some form of contamination, no one is immune, simply by the very fact of existing. By being, we de facto contaminate, do we not ?

All too often students are unaware of various forms of contamination that afflict their community and of what they have lost, of what they are being deprived of. What form of contamination have your students and their community experienced? Are your students and their families aware of it? How do they and their families feel about it? What have they lost through this contamination? Is this loss perceived as critical? Inevitable? Acceptable?

Contamination can be auditory: the noise generated by cars, planes, trucks, motorcycles, off-road vehicles, loud music, dog barking. It can be visual: flashing billboards at night, advertising (ever had a beautiful view obscured by a mammoth billboard by the highway?), telephone poles, antennas, satellites dishes. It can be olfactory: the smells generated by traffic exhaust fumes, sewage delights, industrial fumes or chemical releases, garbage incineration. It can be spatial: where is the human to put himself amidst the traffic, the buildings, the confluence of people ? Contamination can be physically overwhelming, as in the above instances taken individually, but also taken collectively, as in the effects of urban sprawl (that laustrophobic sense that there is no release from the pavement, the noise, the smell, the sight, the containment, the lack of space.) It can be microscopic (bacterial, viral), it can be imperceptible, invisible (radiation).

Contamination can be environmental, but it can also be cultural and social and political. A people, a society, a culture, a way of life is infringed upon, invaded, overrun by another: we have only to think of traditional lifestyles that are threatened, are disappearing, or have disappeared as in the case for many Indian tribes in this country. Family life can be contaminated in as much as it is being monopolized by television: members of the family may communicate, talk, work, play together less.

Contamination presupposes a prior state of purity. A loss has occurred. What was "before" the degradation like? What has been lost ? Laurence Buell writes that Mary Douglas "imagines the perception of defilement as anomalies that violate a culture's deeply embedded ordering categories" (Buell 292). Indeed she has explained, "in short, our pollution behavior is the reaction which condemns any object or ideas likely to confuse or contradict cherished classifications" (Douglas 36). If contamination is an anomaly that violates a right, good order, what is that order?

Perhaps it is in the discrepancy, the rift between "The way it is now" and "the way it was then" or "the way it could be," in the rift between the anomaly and the order that a possible trigger for change lies. In the case of environmental, ecological contamination, the change would be for an improved stewardship of the land and its inhabitants. Perhaps in this loss or in this yearning a sense of crisis can be

generated which might impel people, communities, to demand and effect change. Perhaps, as Lawrence Buell believes, "The rhetoric of apocalypticism implies that the fate of the world hinges on the arousal of the imagination to a sense of crisis" (285). Just how aware are people of the conditions in which they live? Is it true that "the most dangerous threat to our global environment may not be the strategic threats themselves but rather our perception of them, for most people do not yet accept the fact that this crisis is extremely grave" (Gore 36)?

Why utilize the term "contamination" rather than "pollution"? It seems to me that the former term is broader, more inclusive. Pollution stresses the loss of purity and cleanliness through contamination. Pollution is the effect of contamination. Contamination is the cause. The connotations of both terms are equally restrictive. Pollution is usually associated with air, we speak of air pollution. Contamination is often associated with food or blood: the specter of a lethal virus looms. Pollution, however, has a negative connotation in the public mind; it seems less acceptable than contamination which somehow evokes the reparable. I also like the term "contaminate" because of its associative nature: "con" — with — evokes the interdependence and connectiveness of the web of life.

Subject Background

Environmental Contamination in the South Valley: The South Valley Superfund Site

The South Valley is plagued by many forms of environmental contamination: noxious smells emanate from the city's sewage plant, nitrate runs off from the dairy farms. Traditionally agrarian lands and fields are threatened by roads, housing, and commercial projects. Furthermore, the South Valley lies just south of Kirtland Air Force Base and Sandia National Laboratories which are major sources of noise, air, soil and groundwater contamination. For the purpose of this unit, I shall focus on one specific source of contamination: the South Valley Superfund Site.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over five years, \$ 1.6 billion was collected and the tax went to a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites. The trust was renewed in 1986 and 1991. Certain sites are on the National Priorities list (NPL) and as such are the object of long-term remedial response actions aimed at permanently and significantly reducing the dangers associated with releases or threats of releases of hazardous substances that are serious but not life threatening.

The South Valley, more specifically the San Jose community, harbors two such NPL sites: the AT&F (Atchison, Topeka, and Santa Fe Railroad) Site and the

South Valley Site. The former is the location of a wood treating plant that treated various wood products with a solution of creosote and oil. The plant operated from 1908 until 1972 when it was dismantled. Sludge and process residue in the impoundment contaminated the underlying soils and ground water. On April 22, 1999, eighty-four railroad cars of material (6,012 tons) were removed.

The latter site, named South Valley Site, occupies a surface of one square mile and is comprised of several industrial sources of contamination (12 PRPs - Potentially Responsible Parties - have been identified, among them Chevron, Texaco, and General Electric Corporation.) Industrial development in the South Valley began in the 1950's with the construction of a metal parts manufacturing plant by the Atomic Energy Commission. By the 1960's, organic chemicals (solvents) were being handled in the area. Presently, petroleum fuels and various other organic chemicals are stored and handled within the Site boundaries (the war and post-war years featured the development of industrial Albuquerque in general, with the growth of Kirtland Air Force Base and the founding of Sandia Laboratories). When pollutants such as benzene, trichlorethiène, DDT were found in shallow, intermediate, and deep ground water, two city wells were decommissioned (1981) as well as twenty private water supply wells. A residential district of 590 people lies adjacent to the north of the General Electric facility. Approximately 70,000 people in Albuquerque are served by the San Jose water supply system.

Environmental Contamination in New Mexico : The Nuclear Landscape

World War II and its aftermath marked the beginning of an industrial explosion in Albuquerque and the South Valley in particular, as we have seen. It also spawned a new phenomenon — nuclearism which Valerie Kuletz defines as, " the entire complex of nuclear weapons testing, research, and development, production, stockpiling, and waste disposal from nuclear weapons development and nuclear power plants" (291) which transformed the Land of Enchantment into an invisible "nuclear landscape" (8-14), earning New Mexico today the title of nuclear capital of the world.

The atomic bomb, which allegedly allowed us to put a victorious end to the War was born here in New Mexico. The famous Manhattan Project which developed the bomb was housed at the Los Alamos National Laboratory (LANL), which spreads across 43 square miles of the high Pajarito Plateau of northern New Mexico. The atomic bomb was first tested on July 16, 1945, at Trinity Site, today White Sands Missile Range, located near Alamogordo in southern New Mexico and spanning 43 square miles of desert. Nuclear activity in New Mexico did not end with the making and the testing of the atomic bomb in 1945. It literally mushroomed with the Cold

War: as research, development, and testing escalated, Sandia Labs and Phillips Laboratory at Kirtland Air Force Base on the immediate outskirts of Albuquerque expanded, as well as Fort Bliss Military Reservation, Holloman Air Force Base south of White Sands, and the Gnome and Gasbuggy nuclear test sites. Increased

nuclear activity demanded more and more uranium, and it was extracted from Indian lands in the Grants Mineral Belt and San Juan Basin in New Mexico, so much so that in 1976, the Department of the Interior called the New Mexico portion of the Grants Mineral Belt "the hottest uranium exploration area in the country" (Kuletz 23). The Jackpile-Paguete mine located on the Laguna Reservation, west of Albuquerque, was until 1980 the largest uranium mine in the world, covering 2,800 acres.

As nuclear research, production, testing, and then uranium mining expanded, nuclear waste was generated both here in New Mexico by the military and nationwide by the commercial sector (nuclear power). The waste had to be stored somewhere and New Mexico, which had given birth to atomic energy, would become the cemetery of its lethal offspring. New Mexico became the harbor for waste repositories, containment in deep- geologic disposal, above-ground temporary disposal, or shallow disposal.

Of the two potential national, deep-geologic, high-level, and military waste sites in the United States, one is located in New Mexico: the Waste Isolation Pilot Project (WIPP) near Carlsbad, New Mexico, will be the nation's first permanent repository for plutonium-contaminated (or "transuranic") radioactive waste created from nuclear weapons production. The disposal area will exceed 100 acres, although the site's surface area covers more than 10,000 acres. The mine sits 2,150 feet below ground in salt beds. "Creeping" salt is supposed to seal in the waste and isolate it for tens of thousands of years. Controversy over WIPP focuses on potential groundwater contamination, gases that would be generated by the decomposing wastes, and the hazards posed by transporting approximately 30,000 truckloads of waste to the site.

Aside from WIPP, New Mexico's Mescalero Apache Reservation, which lies some sixty miles distant from WIPP, was the proposed site for above-ground monitored retrievable nuclear waste storage.

Bombs as they were produced had to be stored someplace: the Manzano mountains, just a few miles to the east of metropolitan Albuquerque, are the former site of the nation's and the world's largest nuclear weapons stockpile; until recently this facility housed 1,000 bombs.

The military and the nuclear industry undoubtedly brought economic development to an otherwise agrarian, impoverished state. To this day, however, New Mexico remains the nation's third poorest state. The price has been high and the toll of nuclear contamination on the land and the people has not been assessed and recognised. What are the effects of fallout from nuclear bomb explosions, from uranium mining and tailing, from stockpiling of nuclear bombs and waste? What are the effects of radiation, whether it be airborne, whether it settles into the soil and vegetation, whether it infiltrates into the water, both above and below ground? If one believes the Department of Defense (DOE) and the Environmental Protection Agency (EPA), the danger to humanity is minimal. If one listens to the

people who live on the land, to the activists who seek to unveil the truth, if one looks at the scientific data from abroad (Hiroshima, Chernobyl), if one pays attention to certain scientists, even certain studies emanating from official institutions, then the picture is far from reassuring: the cost to certain populations seems excessive and unacceptable.

According to Kuletz:

Large amounts of water are used in the mining process and mountains of uranium tailings are produced as a byproduct. Uranium pollution poisons earth, air, and water. Radioactive particulates (dust particles containing uranium 238, radium 226, and thorium 230) blow in the desert winds, and radioactive elements travel in both surface and ground water. Radioactive materials from the mining of uranium produce radon and thoron gases, which combine with the molecular structure of human cells and decay into radioactive thorium and polonium. The dust irritates cells in the lining of the respiratory tract, causing cancer. Radioactive materials can also damage sex cells causing such birth defects as cleft palate and Down's syndrome (26).

The worst single nuclear accident in U.S. history occurred on July 16, 1979, at Church Rock, New Mexico, when the United Nuclear Corporation's tailings dam broke, sending at least 94 million gallons of radioactive water into the nearby Rio Puerco. This massive radioactive pollution was never reported in the national press; no serious study of possible radiation contamination of soil sediment was ever conducted; no large-scale study of exposure was ever initiated; the Navajos were told immediately that the water that poured from the mines was not safe to drink. An out-of-court settlement of \$525,000 was offered as a collective payment to victims of the Rio Puerco disaster.

The uranium mines and tailings are left unreclaimed, and the EPA deems them all "too remote" to be of "significant national concern." However, the contamination is such that a 1978 study by LANL concerning rehabilitation of land and water contaminated by uranium mining and milling offered one solution: "to zone such areas as forbidden to human habitation" (Kuletz 27).

All too often the populations effected by nuclear fallout, water and soil contamination are supposedly not large enough to warrant scientific studies. Furthermore they are often disenfranchised ethnic groups who do not have much say on the national political scene, and, when they do go to court, the judicial decisions and/or settlements are minimal because their voices are silenced or ridiculed.

From the extraction of the necessary raw material (uranium), to the research and production of bombs (Los Alamos National Laboratory, Sandia National

Laboratories), to their testing (White Sands Missile Range, Gnome and Gabuggy test sites), to nuclear waste repository sites, both above and below ground, it all took place right here in the Land of Enchantment.

Environmental Contamination in the Southwest: Environmental Racism

The nuclear landscape exists throughout the United States; the majority of nuclear power plants are in the East, the North American Great Plains are studded with a thousand intercontinental ballistic missiles, but "nowhere has it emerged as extensively as in the Southwest interdesert region" (Kuletz 10). New Mexico's nuclear landscape is replicated in Nevada, southeastern California and parts of Arizona, Utah, Colorado, and Texas. This region is home to thousands of abandoned and unreclaimed open-pit and underground mines and mills, another national site for deep geologic waste repository (Yucca Mountain, Nevada), the site where the US has detonated more than 928 above-ground and below-ground nuclear bombs (Nevada Test site), as well as hundreds of secret and previously undisclosed nuclear tests. Whole mountain ranges and desert valleys have been transformed into massive weapons testing theaters.

"Originally chosen for its inaccessibility and inhospitable character — making secrecy easier to maintain — the interdesert region now stands as a testament to our entry into the nuclear age and to the dominance of the military-industrial complex of the late twentieth century" (10). Significantly, this region is home to the majority of landbased American Indians alive today on the North American continent. Navajo, Hopi, Ute, Mescalero Apache, Western Shoshone, Southern Paiute, Owens Valley Paiute, Skull Valley Goshute, San Idelfonso, Santa Clara, Fort Mojave, and Chemehuevi lands abutt these nuclear theaters. So do traditionally Hispanic communities such as Espanola and Albuquerque's South Valley. Of further consideration is the fact that the contaminated waters of the Rio Grande river flow through many Indian and/or Hispanic communities and are used for irrigation. "The development, testing, and waste storage of nuclear materials in the highly militarized landscapes of the western United States might be understood as a form of environmental racism" (12). Have the desert lands become marginal lands? Has a geography of the sacred become a landscape of national sacrifice?

Nature : Historical Fact and Literary Pastoral Ideology

As the natural environment is being contaminated and defaced we are bound to reflect on what is lost, how this loss came about, what nature has meant to us as Americans, how nature has been imaged in the American collective psyche. How have we as Americans "imagined" nature, defined, and enacted our relationship to it, both in history and through literature?

There seems to be a discrepancy between how nature is treated throughout American history and how it is portrayed in American literature. We have not treated nature the way we have written about her.

Settlers came to the New World because resources were getting scarce in the Old World. Land and its resources were bountiful here; as they grew scarcer, the move west developed, new lands were sought, found and taken. In time, resources were depleted in the West too, the buffalo herds disappeared, so did the prairie, the great rivers were dammed, rerouted, polluted. Forests were logged, lands overgrazed and desertified. Man used nature to secure his ever-growing needs, took from the land all he needed and wanted. Yes, vast tracts of lands were preserved (National Forests, National Parks, Wilderness Areas), but this just in the nick of time, and these havens of nature are not to this day guaranteed preservation.

Nature has been dominated by man, tamed as a wild animal might be. When it hasn't been domesticated, it has been relegated to the status of landscape, a backdrop to human activity. Thus nature can be an amusement park, a source of entertainment, an outdoor industry: people go skiing, rafting, mountain biking, off-road driving, etc. When nature isn't a backdrop to human entertainment, it has become a tourist commodity, to be visited for its grandeur. Nature even when it is preserved, when it is in its purest state today is an object, a place to "go to," to admire and enjoy. By and large, nature makes money all around, whether the land is mined, cultivated, grazed, industrialized, parceled into subdivisions, enjoyed as a setting for sports or simply visited for its beauty.

Nature is the "other", to be appropriated by man through domestication and exploitation of its resources. Man and nature are two distinct entities. Sometimes a bridge, an identification between man and nature, is built; for example, nature is personified or vice versa the human is "naturalized." Interestingly, man's relationship to nature is revealed by the names he designates to nature. Here in New Mexico, a mountain west of Albuquerque has been named Mount Taylor by the anglophone settlers, Cebollera (covered with onions) by the Spanish settlers and Seepina (Woman veiled in clouds) by the Keresan speakers. The Anglo has totally appropriated the mountain, giving her his name; the Spanish has described her by her natural features (onions), the Indian has personified and gendered her while at the same time ascribing her natural characteristics (the clouds). The cultural differences are clear. The Indian appellation creates a symbiosis between the human and the mountain.

Rarely, except in the American Indian world view, does the human seem to be considered a part of nature, at one with her. Naming is again of interest. Some Europeans do use natural terms to name themselves: Daisy, Rose More systematically and significantly, however, is the American Indian tradition of belonging to a clan which is always of the natural realm : the Bear clan, the Water clan, the Sun clan. Man is named as belonging to nature, man is part of nature, on an equal footing with other elements of nature; he is not an exterior, superior being.

Where did Western man get this idea that he was superior to other elements of nature?

Although virgin land was bountiful in the New World, many of the first Christian settlers considered it a wilderness (regardless of the fact that the land was inhabited). And wilderness was synonymous with evil. Paradise was a garden, a bountiful and beneficent natural setting. The wilderness on the other hand was desolate and foreboding. "The land is the Garden of Eden before them, and behind them a desolate wilderness" (Joel 2:3). In the Old Testament when God wants to punish man for his sins he uses the wilderness as punishment: the cities of Sodom and Gomorrah become parched wastes of salt pits and thorny brush. The wilderness is a kind of Hell. With the Exodus the Judeo-Christian understanding of wilderness takes on a new dimension: the Israelites suffer through the Sinai Peninsula for forty years in this "howling waste of the wilderness" (Deut.32:1 0). But it is here that Moses receives the Ten Commandments, it is here that the covenant between Yahveh and Israel is formed. So the wilderness is understood as a haven from persecution (Egypt), but also as a testing ground where a chosen people are purged, made ready for the land of promise. Wilderness as sanctuary was perpetuated in Christianity. John the Baptist seeks the wild valley of the Jordan River to revitalize faith and make ready for the Messiah. Jesus goes to John in the Judean desert for baptism and fulfills the prophecy of Isaiah that the prophet would be heard crying "in the Wilderness" to prepare God's way. Immediately thereafter Christ "Was led up by the Spirit into the wilderness to be tempted by the devil" (Isaiah 40:3-5; Matthew 4:1).

As the early settlers faced the wild and struggled to survive, transforming the wild into the rural became a matter of necessity and found its justification in the Scriptures. In Genesis 1:28, the first commandment of God states that mankind should increase, conquer the earth, and have dominion over all living things. The Puritan pioneers considered their mission as breaking the power of evil, both in man and nature. The wilderness had to be conquered. This was done in the name of God and progress and prosperity and power. After all, as Andrew Jackson asked in his 1830 inaugural address, "What good man would prefer a country covered with forests and ranged by a few thousand savages to our extensive Republic, studded with cities, towns, and prosperous farms, embellished with all the improvements which art can devise or industry execute" (Nash 41). As Nash further explains, "Subjugation of wilderness was the chief source of pioneer pride" (42). The settlers thought of themselves as "agents in the regenerative process that turned the ungodly and useless into a beneficent civilization" (43).

While man's superiority over nature was not to be questioned, independence and newly won freedom gave birth to a need for an "American" identity, and, wilderness having no counterpart in the Old World, it became an asset, a basis for national self-esteem. The Romantic movement further changed the outlook on wilderness from repulsiveness to appreciation, as writers, scientists, vacationers, gentlemen — those who were not pioneers — associated nature with beauty and godliness.

In his retrospect of American pastoral scholarship, Laurence Buell writes, "Nature

has long been reckoned a crucial ingredient of the American national ego. Ever since an American literary canon began to crystallize, American literature has been considered preoccupied with country and wilderness as setting, theme, and value in contradistinction to society and the urban" (33). Pastoral ideology, a "green" script seems to prevail in American literature. There is a tendency among many writers and critics to want to "represent the essential America as exurban, green, pastoral, even wild" (32).

"American literature to this day continues to be more rustically oriented than the living habits of most Americans, scarcely three percent of whom live on farms anymore. American criticism has repeatedly stressed the historic importance of pastoral, frontier, and wilderness themes to the American imagination" (15). Has this tendency to idealize man's relationship with nature been a screen and therefore a tool for territorial conquest over the centuries, as certain critics suggest? (35)

There is a rift between Americans' increasing energy-consciousness and their consumption-addiction, just as there has been a discrepancy between our nature-loving and our resource-consumption. This split consciousness is echoed in the disparity between how we have treated nature and how we have written about her.

Are there alternatives to conquering nature out of fear? Or to exploiting her for "utilitarian" purposes (be they economic prosperity or simply entertainment) ? Can the earth be considered on an equal footing with man — a part of man — and he, a part of her? If humans are a part of nature, how can they contaminate her without contaminating themselves?

Implementation

This unit, which grew out of a desire, a need to root the curriculum in the community, will be implemented in the context of a cross disciplinary thematic curriculum. Ten math, science, social studies, and English teachers of various grade levels at Rio Grande High School have decided to develop an environmental curriculum divided into two themes: contamination for the first semester, clean alternatives for the second semester.

More specifically this unit fits into the first semester theme of contamination and correlates to the chemistry in the community class taught by Jeff Lambert.

Students in the chemistry in the community class will be studying a Superfund Site located in the community. They will present their findings publicly to the community on the evening of December 5, 2000, in our performing arts building. On this occasion, my students will hand out to community members a book that they will have written on the theme of contamination and nature.

Unfortunately these two classes are not team taught, are not part of a block class; the students enrolled in both classes are not necessarily the same. However, the classes are taught at the same time, and there will be days when one class will be

able to visit the other. The chemistry in the community class will share the results of their investigation of the Superfund Site with my class and vice-versa. My class will submit a draft of their book to the chemistry class. Furthermore, guest speakers and field trips will be shared. This is a first step for us towards team teaching inter-disciplinarily at the upper grade levels.

My students' exploration of contamination and nature will be two-pronged: both experiential and literary. When addressing contamination we will on the one hand visit the Superfund Site as well as other contaminated areas of the South Valley, while on the other hand we will read and write about contamination. When addressing nature we will experience her, on the one hand at school, at home, in the neighborhood, and on wilderness outings, and, on the other hand, through reading and writing.

Students will engage in free-writes, journals, personal narratives, poetry writing, speech writing, broadsides, essays — all of which they will be able to include in their book to be handed out to the community on December 5, 2000. Guest speakers — experts on some of the issues of contamination and community — will be invited to the classroom. Students will be assessed on the quality of their participation in class discussions, the written work that they will be doing in the course of the unit, and, finally, on their contribution to the book to be distributed to the community on December 5, 2000.

In line with the community based focus of the environmental curriculum being created at Rio Grande High School, this unit will begin with what the students know best — their community and a specific form of contamination it is subjected to. The exploration of the theme of contamination will then widen to a larger scope, that of New Mexico, and finally it will broaden to that of the Southwest. Inevitably, the question of national and global contamination will be posed, but it does not lie within the scope of this unit and will therefore not be addressed here.

The second part of the unit will focus on the "uncontaminated" : nature. We will begin by asking certain questions, such as "what is nature ?" "what is it's value?" "what is the relationship between man and nature?" "what is the American perception and experience of nature?" and look at certain poems that address these questions. Then, as we investigate American literature in a chronological fashion, we will constantly interrogate the texts in terms of the above questions. The first semester (the duration of this unit) our study of American literature will extend to the post-Civil War period. A continuation of this unit next semester will address our school's theme of "clean alternatives" and will look at post-Civil War through contemporary literature.

Following is the sequential "flow" of questions and topics that are the backbone of this unit.

Part 1

Contamination

(4 weeks)

What is Contamination ? What and who is Contaminated ?

Superfund and the South Valley

The Nuclear Landscape in New Mexico

Environmental Injustice in the Southwest

Part 2

The "Uncontaminated" : Nature

(6 weeks)

What is Nature? How Do You Perceive Nature ?

Early America to 1750 : A Natural Paradise ?

(*Christopher Columbus, John Smith, William Bradford, Jonathan Edwards*)

The Call of Liberty : 1750-1800

(*Patrick Henry, BroadSides, The Iroquois Constitution, The Declaration of Independence, Jean de Crevecoeur*)

Romanticism : 1800-1865

(*Ralph Waldo Emerson, Henry David Thoreau, Nathaniel Hawthorne*)

Part 3

Editing of Student Book

(2 weeks)

Sample Lesson Plans

Lesson 1 : Introduction to the Unit and Concepts of Contamination (1 to 2 days)

Performance Standards met :

Speaking Skills - A. Communication and Presentation skills 1&7

Reading Comprehension skills - A. Literal Comprehension 3; B.

Interpretive/inferential Comprehension 2; C. Critical/Applicative Comprehension 1.

Writing skills - B. Writing Process 1.

This is the first lesson of the unit and its purpose is to expose students to the concept of contamination, have them measure their level of awareness of the issue (teacher also discovers it) and introduce the unit to them.

Before introducing the unit, have students do a ten minute freewrite on contamination. "When you hear the word contaminate, what does it mean to you? What do you think of? What do you see? Hear? Smell? Feel?" Ask volunteers to read what they wrote. Class discussion. Brainstorming and recording on butcher

paper on board of concepts generated. Teacher supplements if necessary. Concepts touched upon might be : food contamination, bacterial or viral contamination (the flu, a cold, AIDS), noise pollution generated by nearby airport, air pollution caused by cars, incineration, water contamination caused by chemicals that have leached into the soil or run-off and erosion, acid rain, radiation.

Students read the first chapter of Rachel Carson's *Silent Spring* entitled "A Fable for Tomorrow." Class discussion. What happened to that town?

Handout syllabus. Inform students of the project : the book they will write and present to the community and the fact that they will be working with the chemistry in the community class.

Take a poll : how many students have heard about the South Valley Superfund Site? Collect through class discussion the collective knowledge of the topic. A volunteer brainstorms, records on board. Provide supplementary information, though not too much because students will do their own research on the Internet.

Materials: map of the South Valley.

Assessment : students' freewrites, notes and participation in class discussion.

Lesson 2. What is the South Valley Superfund Site ? (5 to 7 days)

Performance Standards met :

Research skills - A. Source Information 1 & 2; C. Uses of Information 1. Writing Skills - C. Practical Application of Writing Skills 1,35; D. Revising and Editing Skills 1. Listening Skills - A. Individual and Group Listening Skills 1,2,3,4,5,6,9,10, 11,12.

Speaking Skills - A. Communication and Presentation Skills 1,2,3,5,6, 9,10,11.

Second lesson of the unit. The purpose is for students to research and learn about the history of Superfund and the specifics of the South Valley Site.

Research is done in the computer laboratory on the Internet. The class is divided into two research themes : the history of Superfund and the South Valley Site. Students do their research individually for a few days and then form into groups of three to pool and organize the information they have gathered. They draft their findings into paragraph form (a group text) and present it to the class.

Guest speaker: a member of the San Jose Community Awareness Council, the community organization that is charged with coordinating citizen input. Students are required to take notes.

Assessment : students are graded on their individual research, on the group draft and presentation and on their behavior and note taking during the guest speaker's

visit.

Lesson 3. What other forms of contamination exist in the South Valley ? (5 days)

Performance Standards met :

Research skills - A. Source Information 1 & 2; C. Uses of Information 1. Listening Skills - A. Individual and Group Listening Skills 1,2,3,4,5,6,9, 10,11,12.

The purpose of this lesson is for students to discover the other forms of contamination which exist in the South Valley : the other two Superfund sites, the sewage plant, the leaking gas tanks, the run-off from the dairy farms.

Students research the topic on the Internet. Again students are divided into groups and are responsible for drafting their findings and presenting them to the class.

Guest speakers: Graduate students from the University of New Mexico's Department of Urban Design who are also South Valley residents. Students draft their notes into narrative form.

Assessment: students will be graded on the quality of their research and presentation and the narrative which they will have written.

Lesson 4. Are these contaminations unique to our community ? (10 days)

Performance standards met :

Listening Skills - A. Individual and Group Listening Skills 1,2,3,4,5,6,9, 10,11,12.
Reading skills - A. Literal Comprehension 34; B. Interpretive/inferential Comprehension 1,2,4.

The purpose of this lesson is to give an overview of the contamination occurring beyond the South Valley, in New Mexico and in the Southwest and to introduce the concept of environmental injustice.

Students read Williams, Terry Tempest. "The Clan of One-Breasted Women." *Refuge*. New York: Vintage Books, 1991 : 281-290.

Speakers : member of the Southwest Research and Information Center, an educational, scientific, nonprofit organization involved primarily in energy and environmental issues.

---.Testimony of radiation survivors.

Having received this information orally, students draft their notes into narrative form. We then read the following two poems and use them as model for student poetry writing.

Hogan, Linda. "Oil." *Sisters of the Earth : Women's Prose and poetry About Nature*. Ed. Lorraine Anderson. New York Vintage Books, 1991 : 310.

Mirikitani, Janice. "Love Canal." *Sisters of the Earth: Women's Prose and Poetry about Nature*. Ed. Lorraine Anderson. New York : Vintage Books. 1991 : 287.

Materials : map of the Southwest on which students can locate nuclear sites.

Assessment : 1) Students will be graded on the notes they take during the visit of guest speakers and the narrative they compose about it. 2) Students will be graded on poems they write.

Lesson 5 (10 days)

Performance Standards met :

Reading Comprehension - A. Literal Comprehension 1,3,4,5; B. Interpretive/inferential Comprehension 1,2,3; C. Critical/Applicative Comprehension 1,2,3,4,5.

Writing Skills - A. Variety of Purposes/Modes 1. D.7,8,9.

Speaking Skills - Communication and Presentation Skills 1,2,3,4,5,7, 8,9,10.

This is the first lesson of the second part of the unit which focuses on the "uncontaminated" i.e.- nature.

Students do a free-write on the question : "What is nature ?" Class brainstorming. Answers will vary; animals, humans, vegetation, open space, the sky, everything that man has not built or maybe touched.

Another free-write: "What is the value of nature ?" and then, "How do you perceive nature? How do you feel about it ?" As students do these free-writes and the class discusses the concepts involved, the following poems are read and analyzed. Students compose their own poems "in the style of" the poets read.

O'Hara, Frank. "A True Account of Talking to the Sun at Fire Island." *Rose, Where Did You Get That Red? Teaching Poetry to Children*. Kenneth Koch. New York: Random House, 1973: 298-300.

Joy Harjo. "Fire." *Sisters of the Earth : Women's Prose and Poetry about Nature*. Ed. Lorraine Anderson. New York: Vintage Books. 1991: 3.

Mora, Pat. "Lesson 1 and Lesson 2." *Sisters of the Earth: Women's Prose and Poetry about Nature*. Ed. Lorraine Anderson. New York : Vintage Books. 182.

Oliver, Mary. " Ghosts." *American Primitive*. Boston: Little Brown, 1983: 28. ---. "Wild Geese." *New and Selected Poems*. Boston: Beacon Press, 1992:110.

Williams, William Carlos. "Portrait of a Lady." *Selected Poems*. New York: New Directions, 1968.

---. "Rain."

---"The Bird's Companion."

---. "To Waken an Old Lady."

---. "The Locust tree in Flower."

Visual analysis of how nature is perceived and represented in advertising. A homework assignment : bring to class newspaper or magazine advertisements in which an element of nature is utilized to help sell the product.

Field trip: a day hike up the Sandia Mountains. Students are required to do journal observations.

Assessment: students will be graded on their participation in class discussion, their poetry, their recitations and their journal entries.

Documentation

Student Bibliography

Anderson, Lorraine, ed. *Sisters of the Earth: Women's Prose and Poetry about Nature*. Ed. Lorraine Anderson. New York: Vintage Books. 1991.

This anthology is a collection of poems, essays, stories and journal entries by women (1800's to the present)

Carson, Rachel. "A Fable for Tomorrow." *Silent Spring*. Boston: Houghton Mifflin Company, 1987. 1-3.

Carson, Rachel. "The Earth's Green Mantle." *Silent Spring*. Boston: Houghton Mifflin Company, 1987. 63-83.

One of the first widely publicized books to call attention to the unwanted destruction caused by pesticides and insecticides and to the danger they represent for human health.

Ginsberg, Allen. "Homework." *Selected Poems*. New York: Harper Collins, 1977: 322.

Allen Ginsberg (1926-1997) is one of the major voices of the "Beat Generation" of the fifties and sixties.

Joy Harjo "Fire." *Sisters of the Earth: Women's Prose and Poetry about Nature*. Ed. Lorraine Anderson. New York: Vintage Books, 1991: 3.

This poem is from *What Moon Drove Me to This?* Joy Harjo (1951 -) is part Creek, Cherokee and French and her poems have been influenced both by the oral tradition of the people and by feminist thought.

Hogan, Linda. "Oil." *Sisters of the Earth: Women's Prose and poetry About Nature*. Ed. Lorraine Anderson. New York Vintage Books, 1991 : 31 0.

This poem is from Hogan's book *Eclipse*. Linda Hogan (1947-) is a mixed-blood Chicksaw who focuses as a writer and an activist on the destruction of the earth and encouraging skills for survival.

Mirikitani, Janice. "Love Canal." *Sisters of the Earth: Women's Prose and Poetry*

about Nature. Ed. Lorraine Anderson. New York : Vintage Books, 1991 : 287.
This poem is from Mirikitani's *Shedding Silence*. Love Canal is the former toxic waste dump site in Niagara Falls, New York, on which a school and homes were built. Deadly chemical contamination became apparent and the city and Hooker Chemical Company did not respond until twenty-six year old housewife Lois Gibbs started a neighborhood campaign which she ultimately won.

Mora, Pat. "Lesson 1 and Lesson 2. " *Sisters of the Earth: Women's Prose and Poetry about Nature*. Ed. Lorraine Anderson. New York : Vintage Books, 1991 :182.

Pat Mora(1942-)says,"The desert, mi madre, is my stern teacher." Theses poems come from her book *Chants*.

O'Hara, Frank. "A True Account of Talking to the Sun at Fire Island." *Rose*,

Oliver, Mary. " *Ghosts*." *American Primitive*. Boston: Little Brown, 1983: 28. ---. "Wild Geese." *New and Selected Poems*. Boston: Beacon Press, 1992:110.

Williams, William Carlos. "Portrait of a Lady." *Selected Poems*. New York: New Directions, 1968: 35,40, 32,19, 68.

---."Rain."

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---. "To Waken an Old Lady."

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--- " The Earth's Green Mantle." *Silent Spring* . Boston : Houghton Mifflin Company, 1987. 63-83.

One of the first widely publicized books to call attention to the unwanted

destruction caused by pesticides and insecticides and to the danger they represent for human health.

EPA. *Superfund*. June 2, 2000. EPA. <http://www.epa.gov/superfund/sites/index.htm>.

Joy Harjo. "Fire." *Sisters of the Earth* .- Women's Prose and Poetry about Nature. Ed. Lorraine Anderson. New York: Vintage Books, 1991: 3.

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Pat Mora(1942-)says,"The desert ,mi madre, is my stern teacher." Theses poems come from her book *Chants*.

O'Hara, Frank. "A True Account of Talking to the Sun at Fire Island." *Rose, Where Did You Get That Red?* Teaching Poetry to Children. New York: Random House, 1973.

Teacher Bibliography

Abbey, Edward. *Desert Solitaire : A Season in the Wilderness*. New York: Ballantine Books, 1968.

Anderson, Lorraine, ed. *Sisters of the Earth: Women's Prose and Poetry about Nature*. Ed. Lorraine Anderson. New York: Vintage Books. 1991.

Buell, Lawrence. *The Environmental Imagination*. Cambridge, Massachusetts:

Harvard University Press, 1995.

Carson, Rachel. *Silent Spring*. Boston: Houghton Mifflin Company, 1962.

Dillard, Annie. *Pilgrim at Tinker Creek*. New York: Harper Collins, 1974.

Douglas, Mary. *Purity and Danger: An Analysis of the Concepts of Pollution and Taboo*. London: Routledge, 1991.

Eastman, Arthur M, ed. *The Norton Reader*. New York: W.W. Norton & Company, 1992.

Emerson, Ralph Waldo. *Selected Essays*. New York: Penguin Classics, 1984.

EPA. Superfund. June 2, 2000. EPA. <<http://www.epa.gov/superfund/sites/index.htm>>.

Ford, Marjorie, Jon Ford. *Imagining Worlds*. New York: McGraw-Hill, 1995

Ginsberg, Allen. "Homework". *Selected Poems*. New York: Harper Collins, 1977.

Gore, Albert. *Earth in the Balance : Ecology and the Human Spirit*. Boston: Houghton Mifflin, 1992.

Koch, Kenneth. *Rose, Where Did You Get That Red? Teaching Poetry to Children*. New York: Random House, 1973.

Kuletz, Valerie L. *The Tainted Desert: Environmental and Social Ruin in the American West*. New York: Routledge, 1998.

Nash, Roderick. *Wilderness and the American Mind*. New Haven: 1974.

Roberts, Edgar V. and Henry E. Jacobs, eds. *Literature*. New Jersey: Prentice Hall, 1998.

Rosner, Hy and Joan. *Albuquerque's Environmental Story: Toward a Sustainable Community*. Albuquerque : the Albuquerque Planning Department, 1996.

Silko, Leslie Marmon. *Ceremony*. New York: Penguin Books, 1977.

---. *Yellow Woman and a Beauty of the Spirit*. New York: Simon & Schuster, 1996.

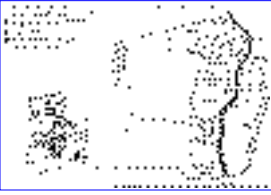
Snyder, Gary. *The Practice of the Wild*. New York: Ferrar, Straus and Giroux, 1990.

Stewart, George R. *Earth Abides*. Connecticut: Fawcett Publications, 1947.

Thoreau, Henry D. *Walden and Resistance to Civil Government*. New York: W.W Norton & Company, 1992.

Williams, Mary Tempest. *Refuge*. New York: Vintage Books, 1991.

Williams, William Carlos. *Selected Poems*. New York: New Directions, 1968.



Map of South Valley showing environmental waste sites.