

**Green English: An Interdisciplinary Approach to Eco-Conscientization**

by

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## **Abstract**

With a focus on the pedagogical and transformative potentials of integrating Environmental Education into existing English as a Second Language (ESL) curriculum, this study offers theme-based lesson plans that promote environmental learning and awareness. This study seeks to explore ways in which eighth grade ESL classrooms can be transformative spaces for the construction of environmentally-sound praxis using the “Environment as an Integrated Context for Learning” model (EIC). For the purpose of needs assessment, a fifteen-item questionnaire was used to measure the environmental knowledge, attitudes and practices of a group of eighth graders from Southwestern Puerto Rico. The mixed results showed that while some students are knowledgeable about certain environmental themes, a significant number of students lack relevant knowledge of very basic environmental facts. Given that people tend to care for what they know about, a collection of ESL lesson plans with environmental content is recommended in a bid to encourage environmental learning, “conscientization”, responsibility and agency.

## **Resumen**

Con el enfoque pedagógico y el potencial transformador de integrar la Educación Ambiental al currículo ya existente ESL, este estudio ofrecerá modelos de lecciones planificadas a base de la promoción del conocimiento y el aprendizaje ambiental. Este estudio procura explorar todas las vías posibles en las que los salones de clase de estudiantes de octavo grado ESL puedan convertirse en espacios transformativos para la construcción de una práctica de conservación ambientalista utilizando el modelo (EIC) “El Medio Ambiente como un Contexto Integrado para la Enseñanza”. Con el propósito de validar esta evaluación (avalúo), se utilizó un cuestionario de 15 preguntas con el fin de medir conocimientos generales sobre el tema del ambiente, las actitudes y las prácticas de un grupo de estudiantes de octavo grado del suroeste de Puerto Rico. Los resultados fueron mixtos y mostraron que algunos estudiantes sí poseen cierto conocimiento de temas relacionados al ambiente, no obstante; un número significativo de estudiantes carecen de conocimientos relevantes acerca de datos básicos relacionados al ambiente. Debido a que las personas tienden a preocuparse y ocuparse por lo que ya saben sobre el tema, una colección de lecciones planificadas ESL con contenido ambientalista es recomendada como una invitación a fomentar el Aprendizaje Ambientalista, su “concientización”, responsabilidad y acción diligente.

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## **Dedication**

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To my husband: thanks for your unmatched practical support and encouragement through the duration of this process. You frequently had to take on the roles of dad and mom as I spent long hours working on this thesis without once complaining. You've taught me the true meaning of love. I will forever be thankful for the gift of you.

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I love all of you with all my heart!

**In Loving Memory of My Father-in-Law**  
His Royal Highness  
Eze Nicholas Akwuruaha (Eje Ogu Onye Ma Nwa Olu) Uwakweh  
Onuoha 1 of Onicha-Nweorie,  
Ọkụ Baa N’iyị Yaa Añyọọ of Onicha-Mbaise,  
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### **List of Abbreviations**

CBI	Content-Based Instruction
CM	Curriculum Map
CPSHI	Committee for the Protection of Human Beings in the Investigation
DE	Department of Education
EE	Environmental Education
EFL	English as a Foreign Language
EIC	Environment as an Integrating Context for Learning
ELL	English Language Learning
ESL	English as a Second Language
IRB	Institutional Review Board
K-12	Kindergarten to Twelfth Grade
MI	Multiple Intelligences
SEER	State Education and Enlightenment Roundtable
TITLE II	U.S. Department of Education's Non-Regulatory Guidance, 2006

## **Chapter 1: Introduction**

### **Justification**

What we do in English language arts is all about noticing, responding to the moment, listening and paying attention, observing, learning to communicate, understanding how things relate to each other. It is about developing the habits of mind for looking closely, thinking critically, thinking by analogy, changing scale, and theorizing—figuring out why something works the way it does or why do we do it this way instead of another. This at its essence is what ecological literacy requires. There are real, tangible connections upon which we might shift our present gaze to think with a more eco-critical eye in the teaching that we do. (Heather, 2011, p.15)

This study seeks to explore ways in which eighth grade English classrooms can be transformative spaces for the construction of environmentally-sound praxis. I conducted a pilot study in the second semester of 2011 which focused on understanding the impact on students of a combined approach to ecological literacy which incorporates “reading green”, creative writing, environmental education (class garden initiative), fine arts, and other content-based knowledge into the sixth grade curriculum. The findings of the case study convinced me that such praxis can only be successful if approached from an interdisciplinary perspective.

Instead of the usual rigid and compartmentalized approach to environmental/ecological education, the paper suggests that a multidisciplinary approach to instilling environmental consciousness in students carries greater moral and intellectual weight; instead of a situation where environmental concerns are restricted to the earth science class, for instance, such pertinent issues are reinforced in other classes, such as the English language class.

In particular, the language classrooms ought to be at the center of the discourse on “incorporating nature-oriented metaphors into the day’s learning” (Hill & Johnson, 2003); it is

because every aspect of the human experience, as well as reality in general, is within the purview of language arts and worthy of substantive intellectual and ethical consideration.

Holownych (2010) emphasizes it is imperative for us to teach young students about the need to take responsibility for their environmental actions and that failing to do so affects them adversely in terms of ill health, lack of performance, misery, and eventual poverty. Social action is linked directly to environmental action.

Freire's theory of participatory pedagogy lies at the heart of the teaching practice which seeks to incorporate environmental and ecological education into every subject curriculum in response to an enduring pattern of environmental degradation across the world. Although the bulk of Paulo Freire's work was not directly connected to environmental issues, towards his final days he astutely iterated that, "ecology has gained tremendous importance at the end of this century. It must be present in any educational practice of a radical, critical and liberating nature" (Freire, 2004, p.47).

Indeed it is safe to assume that one of the most pressing and fundamental necessities of our times is to encourage young people to imbibe environmental and ecological persuasions that will lead to sustainable changes in future generations. O'sullivan (1999) asserts that "the fundamental educational task of our times is to make the choice for sustainable planetary habitat of interdependent life forms over and against the dysfunctional calling of the global competitive marketplace" (p. 2).

There are compelling paradigms which suggest that a relational epistemology across subject-areas is a more viable approach to inspiring sustainability and environmentalist enthusiasm in young students instead of the prevalent demarcations of academic disciplines

which often jeopardize the mission. Helping young students internalize the connectedness of human survival and environmental threats would take more than one class out of several.

Environmental concerns can no longer be relegated to the margins of mainstream educational systems. Hill & Johnson (2003) explains that, “bringing concern for the environment into our teaching practices and learning theories offers the ability to address critical concerns that we and our students bring to our classrooms and work” (p. 24). Essentially, I undertook to pursue this study in order to gain insight into how students’ function and respond to a multidisciplinary approach to ecological / environmental awareness projects and activities.

The study suggests increased interest and motivation in ecological concerns/ green movement on the part of the students. When students and teachers alike approach the learning enterprise as co-partners and view learning as a shared responsibility, they are motivated and empowered to want to explore, discover and acquire knowledge. This is in line with Freire’s (1976) notion of education as a “practice of freedom”. Freire (1970) insists that:

The role of the problem-posing educator is to create, together with the students, the conditions under which knowledge at the level of the doxa is superseded by true knowledge at the level of the logos... Students, as they are increasingly posed with problems relating to themselves in the world and with the world, will feel increasingly challenged and obliged to respond to that challenge. Because they apprehend the challenge as interrelated to other problems within a total context not as a theoretical question, the resulting comprehension tends to be increasingly critical and thus constantly less alienated. Their response to the challenge evokes new challenges, followed by new understandings; and gradually the students come to regard themselves as committed. (p. 62)

Having students involved in every stage of environmental awareness projects fosters in the students the sense of ownership in their learning experience. During the course of the case study on this same topic which I undertook last semester, I noticed an increased level of accountability on the part of the students. The students' heightened accountability is evidenced in the fact that they often took the initiative to water both the indoor and outdoor plants without being reminded to do so by the teacher. In fact, the teacher related during one of the interviews that students often brought fertilizer, super-glo, and other items that they thought would make their garden crops grow lusciously. The multidisciplinary approach therefore accomplished the goal of motivating students to participate willfully in ecological sustainability rather than merely relating "facts and concepts" (Strife, 2010, p. 186).

The students' outward show of excitement and increased interest in outdoor planting provides direct support for other studies, including Strife's (2010) analysis in which she opined that the positive effects on students' wellbeing should be a primary justification for the rallying call to promote ecological education across disciplines.

Also, this study explores the incorporation of arts (drawing) and creative writing in the eighth grade English class. Such a strategy can be characterized as Gardner's (1983) Multiple Intelligences (MI) in action. Gardner has argued that instead of a single intelligence, there are at least seven distinct intelligences. I hope to tap into the concept of designing unique learning situations or opportunities for students to learn and express themselves through multiple modalities and strategies in a conducive and non-threatening environment. It is definitely a holistic approach which fosters constructivist learning within a student-centered context.

A multidisciplinary approach to eco-conscientization tends to encourage constructive thinking and diversity of learning styles in the classroom. Noddings (1992, pp. 44-68) argues that

children will feel valued and accepted in classrooms where their learning styles, preferences, and capabilities are recognized. The spatial or visual component via arts encourages spatial learners to retain, process, and synthesize information in a more meaningful way. Beyond that fact, it helps spatial-inclined students subsequently write in words about the ideas they already have spatial representation for. Borek (2003) makes a similar point in reference to the technique she uses in teaching outlining and drafting in persuasive writing to her high school students. She states:

For instance, grammar terminology may throw them until they have a chance to diagram sentences, which will give them an opportunity to create a graphic translation of the language. I encourage spatial learners to draw pictures in their notebooks and journals in order to stimulate their writing. (para. 22)

Incorporating environmental literacy in a reading class helps the students conceive their unique role and place in an interconnected world that cannot be successfully pieced apart. As Dickinson (2010) puts it:

Literature can thus do what science and policy cannot; it can inspire a cultural change that can affect many readers and create the beginnings of a more responsive society. By altering the way readers see the world and others in it, creative writing can provide a way to bridge the gap between knowledge and action. (p. 15)

Merging environmental education and English language promotes team teaching and other types of collaboration among teachers which can significantly impact the quality of instruction that students receive. Indeed, the importance of gaining expertise across disciplines is reflected in the fact that under Title II, public school teachers can receive government funding for “high-quality professional development” (Non-regulatory Guidance, 2006, p. 1) that

increases and improves knowledge in a variety of academic subjects. Interdisciplinary or cross-domain thematic teaching which has real world applicability can only be a reality in more schools if the support for such endeavors continues to increase at all levels, starting from the administration to the larger public.

## **Research Questions**

1. What does a representative group of eighth grade students from a school in Mayagüez know about environmental themes?
2. What are the attitudes of a group of eighth grade students regarding environmental themes? How can environmental/ecological themes be integrated into the existing Curriculum Map for eighth grade?
3. What are the behavioral patterns of a group of eighth grade students regarding environmental engagement? What kinds of instructional strategies/ lesson plans, which meet the Department of Education's Content Standard and Grade-level Expectations for eighth grade, can be developed with the view of encouraging environmental agency and engagement?

## **Chapter Two: Literature Review**

### ***Introduction***

The majority of professional ecologists and ecological educators agree that “work toward excellence in ecology education must go beyond the concerns of professional ecologists” (Berkowitz, 1993, p. 45).

Despite the recent proliferation of environmentally-correct slogans, often for purely commercial purposes, environmental education has retained an auxiliary status. Strife (2010) raises the question, “why is environmental education still considered “supplementary education” and not seen as a critical approach to developing a more sustainable society?” (p. 180). She suggests that inspiring environmental stewardship calls for a shift in discourse which integrates “environmental education within the school curriculum that includes among other things edible schoolyards, place-based education, and experiential-based programs” (p. 181). Strife (2010) further argues that beyond “saving the trees” which may have contributed to the supplementary status of environmental education, “its positive effects on children’s health, general well-being, cognitive development and safety calls for more proactive approaches in educating for the environment” (p. 185). As she reiterates, part of the reason environmental education has not been very successful in inspiring young students to take more active roles in resolving environmental problems is because environmental education often focuses on a doomsday narrative instead of a positive discourse. When the message is packaged in narratives which students can relate to, it increases the likelihood of their grasping the urgency of the need to get involved in solving the enduring environmental problems in today’s world.

The pivotal role of literature in inspiring environmental consciousness cannot be overemphasized. Cutter-Mackenzie, Payne and Reid (2011) bring together various original

international research-based studies which explore the role of children's literature because it potentially enriches their imagination, experiences and reaction to environmental problems and challenges. All genres of literature from drama, poetry, fiction to non-fiction offer ample avenues for exploring environmental themes in a way that encourages dialogue, analysis and reflection.

### **Defining Environmental Education**

Defining what an environmentally-oriented education is all about is crucial to exploring the relevance and worth of environmental education (EE). Orr's (1992) definition of environmental literacy highlights three major elements: knowing, caring, and practical competence. Orr (1991) insists that "all education is environmental education" (p. 55). Whether students learn that they are "a part of or apart from the nature world" (p. 55) is a direct consequence of what is either included or excluded from the mainstream curriculum. Teachers ought to be aware of the subtle but powerful message sent when environmental education is included or excluded from mainstream curriculum.

Tackling environmental problems necessarily means delving into the complexities associated with the field of EE. Barbosa (1991) underscores the fact that the only feasible way of arriving at lasting solutions to the overwhelming problems is by critically examining the economic, political, social, and cultural factors "that impel and permeate predatory actions" (p.60).

There has been considerable controversy over the definition of EE; even though a universal definition of EE does not exist, a number of basic assumptions can be deduced based on the areas of conveyance of thought on the goals of EE. It is in examining the various definitions that we can arrive at a comprehensive framework for understanding the distinctive components of EE. The uniqueness of EE is predicated on the fact that it is unarguably

concerned with impacting learners' attitudes and behaviors (Scott & Oulton, 1998; IUCN/UNEP/WWF, 1980, sec. 3).

A brief recount of the major contributions in the quest for a definition is necessary. Disinger (1983) states that the term was used for the first time at a conference of the International Union for the conservation of Nature and National Resources in 1948; it was in reference to the merging of the social science and the natural sciences in education. According to him, it was not until the late 1950s that the term began to appear in scholarly work as an alternative term for the dwindling conservation education and even then, not as a distinctive discipline.

Evidently, EE is an offshoot of prior nature-centered scholarship such as conservation education, nature study, and outdoor education (Roth, 1978; reported in Andrejewski, 2011; Neill, 2006). While Nature Study was a values-based tradition which focused on drawing attention to the splendor of nature, Conservation Education was a consequence of the devastation of the Great Depression of the 1930s. Other related fields which were influential in the development of EE are ecology education, population education, progressive education, multidisciplinary education, citizenship education, and global education (Disinger, 1983; Hungerford, 2010).

In the 60s, prominent scholars in both conservation education and outdoor education were concerned with increasing rate of environmental degradation and felt the need to highlight the problem through a mix of eco-pedagogical approaches. This led to the first publication of the EE journal which was solely dedicated to promoting EE as a legitimate field of study (Hungerford, 2010). The enabling environment for this development centered on “growing public interest in land-use management, threatened and endangered species, human population

growth, solid waste management, and energy use and distribution” (p.2). The goals of the movement have been described as helping “learners understand the biological dimensions of issues, the role of issue investigation, the role of human beliefs and values, and the roles played by the citizen, individually and collectively, in environmental issues resolution” (p.2).

The parameters of EE were addressed in the very first issue of the journal. Stapps et al. (1969) offered this definition which states that “Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution” (p.1).

The three elementary tenets of the problem-focused approach are: knowledge of environmental issues, awareness of plausible solutions to the problems, and the motivation to actively pursue lasting solutions. Essentially, environmental literacy is at the heart of EE and it is impossible to talk about EE without considering the associated cultural and educational values, as well as socio-economic concerns (Thomson 2002).

Several other early definitions underscore the appreciation of nature and outdoor experiential education as integral components of a viable EE (Hungerford, Peyton & Wilke, 1980). Over the years, acts of government, legislation, international conferences and workshops have focused on defining EE. Select definitions are emphasized in this study to highlight the different perspectives which help us understand the comprehensive nature and scope of EE.

The Environmental Education Act of 1970 was identified as United States Public law 91-516, and it defined EE as “The educational process dealing with [man’s] relationship with [his] natural and manmade surroundings and includes the relationship of population, conservation,

transportation, technology, and urban and regional planning to the total human environment” (Public Law 91-515, Environmental Education Act).

The Environmental Education Act communicates effectively the various aims of EE which are our relationship with the biophysical surroundings and the need for a sustained cooperative custodianship in order to guarantee human survival and sustenance on earth. It can be deduced that intrinsic valuation and empathy have been essential components of EE from the beginning. The quest to provide a sound structural framework for EE led to two major international conferences on EE which took place in Belgrade, Yugoslavia in 1975 and Tbilisi, Georgia in 1977. At the Belgrade International Workshop, the vital principles of EE were set forth with this definition:

Environmental Education should be an integral part of the educational process, aimed at practical problems of an interdisciplinary character, build a sense of values, and contribute to public well-being. Its focus should reside mainly in the initiative of the learners and their involvement in action and guided by both the immediate and future subjects of concern (UNESCO-UNEP, 1975).

Closely following the Belgrade Declaration, was The Tbilisi Declaration which was the result of an international conference organized by UNESCO. The contributors were mostly environmental educators and scientists from all continents. The declaration was published in its entirety in *Connect*, the UNESCO/UNEP Environmental Education newsletter (January, 1078). It offered a very focused interpretation of EE as it delved into problem-solving and crisis resolution (Hungerford, 2010). The document reads:

Environmental Education is a process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and has

the attitudes, motivations, knowledge, commitment and skills to work individually and collectively towards solutions of current problems and prevention of new ones.

(UNESCO-UNEP, 1978, January 1-8; Reported in Stapp, et al. 1997).

This definition highlights the centrality of collective effort in ensuring the effective resolution of environmental issues. It clearly forms the foundations of EE as an interdisciplinary process. Another portion of the Tbilisi declaration notes that EE “should also provide a wide range of practical skills required in the devising and application of effective solutions to environmental problems” (UNESCO-UNEP, 1978; quoted in Hungerford, 2010, p.2). Numerous scholars have reached the conclusion that a responsible approach to accomplishing the objectives set forth by these international bodies must be predicated on interdisciplinary efforts (Disinger, 1998; Wilke, 1997; Hungerford, 2010). Environmental responsibility, agency, and engagement do not just have scientific or technical dimensions. Fostering long-term cooperative custodianship in students involves socio-economic, ethical, psychological, and cultural considerations; therefore, the consensus among many scholars is that comprehensive interdisciplinary approaches to tackling environmental concerns are unavoidable. Such a multidisciplinary approach will provide individuals with the critical thinking and participatory skills required to make informed decisions about environmental issues (Hungerford, 2010; Bigger & Webb, 2011; Cutter-Mackenzie, Payne & Reid, 2011). The enduring task of environment-conscious educators is articulating curricular content and intent in a way that makes the issues accessible and relevant to students. Hungerford warns that environmental educators in the classroom should not be concerned with advocating any distinctive ideology regarding environmental issues and solutions; rather they should focus on the development of critical thinking skills which leads a learner to an ability or willingness to carefully consider varying

beliefs, values, motives, alternative actions, and personal decisions (Hungerford, 2010; Hug, 1977). Ultimately, nothing short of a holistic framework will compel students to seek solutions to EE issues in the social, political, cultural and scientific spheres of life.

As the field evolves and in order to realize the objectives of environmental literacy, the National Project for Excellence in Environmental Education was established by the North American Association for EE. The project consists of guidelines for EE materials, standards for environmental educators and learning objectives (National Project for Excellence in Environmental Education, 2004). These guides emphasize the following key characteristics which every adequate EE program ought to possess:

1. EE materials should present factually accurate and balanced information which describe and reflect the diversity of viewpoints and theories on environmental problems.
2. EE materials should foster “awareness of the feelings, values, attitudes and perceptions at the heart of environmental issues” (p.20).
3. EE concepts ought to be presented in a personally-relevant context that fosters critical and creative thinking.
4. EE materials ought to encourage civic responsibility, self-efficacy and sense of personal stake.
5. EE materials should be based on learner-centered instruction that connects learning to lived-realities of the learner in an interdisciplinary fashion.
6. EE materials should be coherent, well-organized and easy to use.

The comprehensive guide serves as a reminder of the need to insist on hand-on, minds-on, and interdisciplinary approaches to EE which would stir genuine empathy in the students for pro-environment issues and concerns.

## **Developing Empathy: Consequences for a Pro-environment English Curriculum**

Reflecting on Orr's (1992) declaration that all education is environmental education, regardless of whether we include or exclude it from the curricula, one is made aware of the important role teachers have to play in facilitating students' sensibility to environmental issues. Impressionable as they are, middle school students often look up to the adults in their lives for direction and guidance. When a teacher provides ample opportunities for students to critically examine their attitudes about environmental issues, it invariably increases the likelihood that they would cultivate and nurture an affinity with the environment.

Empathy has been described as having both cognitive and affective components and it serves as a basic for right action (Feshbach, 1984; Hoffman, 1982). Segal (2002) describes empathy as "the ability to gauge a situation through another person's eyes and heart, whether you agree with that person or not. It is the ability to be secure in your own thoughts, feeling, and values that you can also perceive opposing points of view without losing sight of your needs" (p.3). Nel Noddings encourages educators to focus on caring because the cared for tend to develop into caring individuals who express care for self, other people, animals and the environment at large (Noddings, 1992; Creel, 2005; Stout, 1999).

I regularly incorporate environmental themes in my ESL classroom because interdisciplinary, experiential approaches to environmental literacy are more likely to help students develop a sense of commitment to environmental causes than a typical lecture on environmental themes in an earth science or physical science classroom. If the students who are the leaders of tomorrow are groomed to cultivate empathy for the environment, attitudes and behaviors toward the environment would improve (Berenguer, 2010; Hoffman, 2000; Schultz & Zelezny 1998). This assumption is predicated on the fact that empathy can be a learned behavior;

therefore, it is vital that educators focus on exploring multidisciplinary and exciting approaches which enhance students' capacity to empathize with environmental issues (Hoffman, 1982; Beland, 1991; Selman, 1980).

The notion of empathy, just like caring, is central to promoting pro-environmental behavior and attitudes because we tend to actively "protect what we care about, and we care about what we know well" (Grant & Littlejohn, 2004, p. xv). The connection between practical knowledge, theoretical knowledge, attitudes and behavior in relation to developing pro-environmental stewardship is central to this study and is reflected in the instructional unit developed in Chapter four of this work. Based on the proven fact that mere theoretical knowledge of environmental issues in isolation does not necessarily guarantee pro-environmental action and stewardship, this study emphasizes the practical application of environmental knowledge in ways that will make the students recognize their place and role in the larger scheme of things. Keller (1983) notes the importance of relevance as well as attention, confidence, and satisfaction in enhancing motivation in the students. Educators must design instructional units and provide experiential learning opportunities which nurture empathy and care for self, other people, other species and the environment both within the classroom and outside the classroom.

Nurturing empathy is primarily predicated on catching the attention of the students, in the first place. Integrating EE into various subject areas is outside mainstream practice and could potentially propel students to 'notice' or pay close attention to the specific content of EE being conveyed in the English, Social Studies, Arts or Spanish classroom. Long (1996) emphasizes the claim by notable scholars which suggests that attention is a crucial aspect of learning and retention of information. We cannot expect students to act on knowledge which they have been

exposed to but have not necessarily paid attention to. Opening the students' imagination through innovative strategies and exposure to non-traditional learning contexts is pivotal to catching their attention and ensuring they become aware of their relationship to the ecological others, be they other members of the human family, other species or nature. Cultivating an empathetic attitude breeds positive action and directly impacts behavior (Stapp et al. 1969; Manfredo, 2008).

Focusing on real-life issues related to the environment, incorporating EE in the ESL classroom provides ample opportunities for students to read, write, and speak English as they participate in engaging activities both within and outside the classroom setting.

### **Giving EE A Human Face**

The theoretical framework of traditional EE, which is not solidly rooted in multidisciplinary methodologies, has been seen as hindering environmental agency and engagement. Cole (2007) makes the case for multidisciplinary methodologies in the study of environmental education. He advocates a paradigmatic shift as a pedagogical practice. Strife (2010) emphasizes that such a shift has been articulated as "reorienting environmental education to education for the environment" (p. 180). A shift in pedagogical considerations that fosters environmental consciousness across the disciplines is vital to promoting environmental stewardship in students as well as teachers.

Several studies have shown that learning environments where students have first-hand exposure to the environment and are encouraged to cultivate an environmental attachment are more effective than learning centers where transmitting a strong environmental message is not emphasized. A study by Falcon (2004) revealed that students in environment-learning contexts improved their overall GPA; the students expressed enhanced motivation and engagement in the learning process and stayed longer in school. Wells & Evans (2003) found that the benefits of

environmental education are most felt by vulnerable children who face stressful situations in their personal lives. The study's conclusion indicates that exposure to nature helps reduce the effects of chronic stress on high-risk children. Fien (1993) suggests education for the environment and education for sustainability that focus on the desirable impact on the students are the most effective strategies for environmental education which confronts enduring environmental problems. Kyburz-Graber, Hoger & Wolfensberger (2006) argue that "the challenge is for EE to provide learning situations, in which learners have the opportunity to explore, analyze and interpret human actions in real-life situations" (p. 104).

In today's increasingly denatured world, it is imperative to create experiences which would inspire students to reflectively consider their relationship with the natural world. Mazor & Fink (2011) discuss how a set of middle school teachers made a school trip to the Brooklyn Botanic Garden in search of ways to "help students better understand connections between nature, life, and literature" (p. 71). The students who participated in this outdoor educational activity attested to the fact that scenes from Shakespeare's *A Midsummer Night's Dream* came alive to them as they read excerpts from the text at the Brooklyn Botanic Garden. Such an approach encourages team teaching among teachers, as well as fosters sensitivity and appreciation for the environment.

Encouraging interdisciplinary strategies to EE helps students, as well as teachers, develop a personal relationship with the environment which is pivotal to forming attitudes that will in turn lead to right action for a more sustainable future. Yan's (2009) case study explored the dynamics of mainstream curriculum integration through "environmental learning model" which basically implies "integrating environmental learning into the mainstream curriculum" (p. 12). The tangible and encouraging effects of a pilot project on students' environmental literacy,

academic achievement, and social development are discussed. Based on the findings of the case study and the curriculum integration framework, Yan developed a unique curriculum that connects subject matter, social life and students' experiences.

Archie (2001) maintains that environmental learning could significantly improve the quality of education by connecting formal schooling with real life and pursuing a relational epistemology across disciplines. For students who participated in the environment-based education program he studied, it was their first time of interacting closely with nature. The lesson plans to be developed during the course of this study will draw from place-centered literature and activities in order to stimulate students' curiosity and imagination.

The numerous benefits of an interdisciplinary approach to EE which challenges and engages students intellectually, physically and socially provide sufficient grounds to invest in cross-disciplinary programs that focus students' attention on the knowledge, skills and values that could lead to environmental stewardship. When EE is woven into the English curriculum, it offers second language learners the opportunity of learning and exploring vocabulary related to the specific themes.

### **Content-Based Instruction**

The notion of contextualization as an essential aspect of second language acquisition is broadly accepted (Richard & Schmidt, 1983; Sàñchez Pérez, 1993; Widdowson, 1979; Dulay, Burt & Krashen, 1982). Ideally, instructional activities need to be predicated on meaningful contexts, given the fact that meaning stems from context (Widdowson, 1979). The goal is to take the focus away from the language structure and focus rather on communication of content. The expectation is that when the emphasis is on learning a second language within the context of a specific content or subject matter, it fosters intrinsic motivation and student interest (Stoller,

2002; Krashen, 1982). Krashen et al. (1982) underscore the centrality of language environment to success in SLA and conclude that natural communication which occurred where people are interested in the ideas being communicated rather than the linguistic structure of the language tends to be critical to fluency development (Duley, Burt & Krashen, 1982). This is in line with Krashen's theory of 'Comprehensible Input' since teaching is predicated on students' prior knowledge or previous experience (Krashen, 1985; Tickle, 1995).

Second language and foreign language education theorists have touted the merits of content-based instruction by emphasizing the fact that such instruction encourages academic growth, as well as the development of language proficiency (Hall, 2001; Snow, 1998; Stoller, 2004). Brinton, Snow & Wesche (1989) define content-based instruction as "the integration of content with language teaching aims" (p.2). Early models of content-based instruction (CBI) were articulated by Crandall (1987), and Cantoni-Harvey (1987), Mohan (1986), and Nunan, (2003) among others.

When CBI was initially conceived, it referred to the integration of specific subject-area content in both first and second language acquisition; however, increasingly more studies have applied the term to second or foreign language acquisition (Mohan, 1986). In recent times, the term content-area literacy instruction is more likely to be used in reference to first language learning in all-English contexts (Park, 2009). Also, there is the notion of 'Sustained Content-Based Instruction' which is particularly relevant for teaching language as a second language because of the recycling of vocabulary which aids students' comprehension of what they read or hear (Crandall, 2006).

Back to CBI, it has been characterized as part of bilingual education programs, and as such, it is critical to integrating academic content into ESL class or from ESL to an English-

medium class (Ovando, Collier & Combs, 2003). CBI constitutes a dynamic continuum which reflects the diverse needs of the various student populations (Snow, 2001). The “content-driven” approaches on the continuum have strong commitments to language learning objectives, using content only as a tool for language exploration (Davidson & Williams, 2001; Stoller, 2204).

Motivation has been identified as a key rationale for CBI in the ESL-context because of the claim that interesting and relevant material increases student motivation and promotes effective language learning (Tickle, 1995). Brown (2007) opines that the goal of CBI is to realize the academic and linguistic needs of English language learners (ELLs). Stryer & Leaver (1997) underscore the fact that CBI creates the enabling environment for students to be independent learners and apply learned concepts outside the classroom setting. Also, Echevarria, Vogt & Short (2008) note that content-based ESL classes are directed by educators whose basic goal is English language development and whose secondary objective is to prepare students for mainstream education.

CBI as a theoretical paradigm is of little relevance until it is effectively integrated into the language classroom. Stoller (2002) suggests eight practices which facilitate natural content integration:

1. Extended input, meaningful output, and feedback on language and grasp of content
2. Information gathering, processing, and reporting
3. Integrated skills (using reading, speaking and listening in natural classroom activities)
4. Task-based activities and project work, enhanced by cooperative learning principles
5. Strategy-training (to produce more metacognitively aware strategic learner)
6. Visual support (i.e. images, graphic organizers, language ladders, etc.)
7. Contextualized grammar instruction

8. Culminating synthesis activities (knowledge is displayed in writing and orally)

For the purpose of this study, I am interested in CBI as it pertains to the integration of EE in an ESL eighth grade classroom. CBI has increasingly received attention in Puerto Rico, especially at the college level. The same cannot be said for research into CBI applications at the grade school level in Puerto Rico. Given the well-documented and unsettling history of English language education in Puerto Rico, there is need for the development of hands-on, minds-on, research-based strategies in order to improve students' English proficiency levels at the grade level (Mazak, 2008; Algren de Gutierrez, 1987; Pousada, 1999; Duany, 2002). ESL instruction which communicates knowledge that is concrete, relevant to real life, specific and integrated stands an excellent chance of fulfilling the goals of the Department of Education English program.

The focus of the next section is the examination of the concept of *Using the Environment as an Integrated Context for Learning* (EIC) and how it can facilitate English language learning in meaningful ways.

**Closing the Achievement Gap: Using the Environment as an Integrated Context for Learning (EIC)**

The Closing the Achievement Gap: Using the Environment as an Integrated Context for Learning publication document by a 12-state consortium referred to as the *State Education and Environment Roundtable* (SEER) gives integrated environmental education a much needed boost because of the outstanding results contained in the report. In the report, Lieberman & Hoody (1998) established through a survey of forty schools with EIC programs across the United States that students studying within EIC settings have higher standardized test scores and GPA compared to students in traditional classrooms without environment-based education. Based on

their study of the forty schools that used environmental education as a springboard for their curricula, the group “concluded that students learn more effectively within an environment-based context than within a traditional educational framework” (Grant, 1998).

The document defines EIC’s basic concept as “Pedagogy that employs natural and socio-cultural environments as the context for learning while taking into account the “best practices” of successful educators” (SEER, 1998, p.1). The model is predicated on six “best practices” in education and they are “integrated- interdisciplinary instruction, community-based investigations, collaborative instruction, learner-centered, constructivist approaches, combinations of independent and cooperative learning and local natural and community surroundings” (SEER, 1998).

EIC is aimed at promoting and supporting ‘Environment-based education’ (EBE) (SEER, 1998). SEER document describes EBE “as a framework for instruction that focus on standards-based educational results by using the environment and related issues as a context for instruction” (SEER online, 1998). EBE’s goals are three-fold: to help learners attain academic success in content standards, to develop their knowledge of the inter-connection between us and the natural world, and to prepare students to become active civic citizens who have the necessary skills to recognize and resolve enduring environmental problems.

EIC as an approach offers a theoretical as well as practical framework for “interdisciplinary, collaborative, student-centered, hands-on, and engaged learning” (p.1). The State Education and Enlightenment Roundtable (SEER) report was essentially a compilation of success stories of the various institutions, teachers and students who participated in EIC nationwide projects. Given the fact that the EIC programs are located in very diverse locations

and communities, emphasis is placed on uniqueness of each ecological, geographical and socio-economic setting or environment.

According to the report, students across the board who are exposed to EIC programs tend to become “enthusiastic, self-motivated learners” (p.2). Also, it claims that the EIC model has contributed to significant improvement of student academic achievement in several areas such as reading, writing, critical thinking, science, math and social studies; however, the limited focus of this study is on the impact of EIC on English language acquisition.

There were seventeen comparative studies of language arts achievement data that used standardized measures to ascertain the writing and general language skills (SEER, p.4). The students who were exposed to the EIC-model outperformed students who were in traditional programs at all the nine schools where the study was conducted. It is reported that the environment’s widespread appeal to grade-level students created diverse opportunities for language development. The findings of the study on the positive effects of EIC on the students’ language development include:

- Improved development of language arts (94%)
- More success in communicating with others (94%) and with public and private agencies (91%) (p.4).

Despite the concern that content-based programs, such as the EIC, may not sufficiently treat the subject content, the SEER study showed that students in the programs actually had more comprehensive understanding of the content than their peers in traditional programs (Grant, 1998).

## **Relevant Prior Research**

*Linking Language and the Environment Greening the ESL Classroom* by George Jacobs, Payomrat Nopparat, & Susan Amy (1998)

Linking Language and the Environment provides fascinating and practical support with its combination of the fundamental principles of language instruction and a wide variety of practical classroom activities to illustrate those principles. Its format and approach will be welcomed by teachers and learners concerned with exploring a more relevant, interesting and socially significant content in the ESL classroom. Language skills provide a vital avenue towards the realization of a new vision for a 21<sup>st</sup> century where environmental sustainability is given the maximum attention it deserves. Since many of today's environmental educators and researchers share the view that ecoliteracy is essential, such a book which links language and the environment by providing many stimulating and thought-provoking activities, demonstrates how incorporating EE in the English language curriculum can prove to be a rich resource for purposeful language learning.

*Teaching Green: The Middle Years- Hands-on Learning in Grades 6-8* by Tim Grant & Gail Littlejohn

*Teaching Green: The Middle Years* was designed with the view of enlightening young learners about the knowledge, skills and values of active environmental citizenship in the 21<sup>st</sup> century. It is specially designed to promote interdisciplinary hands-on approaches to teaching environmental topics from biodiversity to sustainable living to energy conservation. The book contains a wealth of accessible background information and recommendations for practical projects and developmentally-appropriate activities. It has contributions from over 60 educators

and has innovative ideas for integrating green themes into subject areas across the spectrum. Even though it also covers strategies and activities for incorporating EE into diverse subject-areas such as science, mathematics, languages, and social studies, there's sufficient emphasis on language arts which connects to my research in meaningful ways. The book underscores some of the key tenets of CBI which are collaborative instruction, constructivist approaches, problem-solving projects and real-life revelations. In many practical ways, the thematic units provide a blueprint for lessons and projects which encourage independent decision-making and the formation of positive attitudes toward the environment. By designing a comprehensive book which is accessible to educators, parents, and students who are less familiar with environmental literacy, the authors open the way for broader integration of EE in mainstream curriculum.

*Alliance: The Michigan State University Textbook Series of Theme-based Content Instruction for ESL/EFL: Ecology and the Environment- A Look at Ecosystem of the World* by Amy L. Tickle (1995)

Even though the theme-based content instruction for ESL/EFL learners is primarily designed for college students, the author makes it clear that most themes are appropriate for grade-level students as well. The textbook series afford teachers, as facilitator of understanding, the accessible tools, knowledge and strategies they need to help students improve their language competence as well as increase the students' knowledge of ecological themes and environmental concerns. Topics on ecology are divided into chapters on ecology, structure of the ecosystem, forest ecology, ocean ecology, tundra ecosystem, grassland ecosystem, and dessert ecology. Simultaneously, the chapter lessons and innovative activities are on vocabulary development,

reading comprehension; parts of speech; essay structure; comparison/contrast; speaking/listening; verb tenses; and other language-related topics.

The Alliance textbook series are based on pilot projects which confirmed that English teachers who were unfamiliar with the topic of ecology/environment were able to easily teach the manual because of the detailed explanations and the teacher's manual provided.

*Teaching Place-Based Environmental Education to English Language Learners* by Alden Glinert (2009)

Glinert's thesis is focused on "creating solutions in curriculum design for English language learners in a bi-cultural educational setting, while also directing lessons toward social and ecological literacies" (Glinert, 2009, Abstract). Each lesson is tied to environmental restoration and vocabulary development related to the specific subject under investigation. Gilbert emphasizes that for ESL/EFL students who already have negative filters about traditional educational settings, place-based education is a dynamic way of rekindling interest in learning and improving school retention. Gilbert's multi-disciplinary approach serves as a model for comprehensive Green English curriculum because it incorporates environmental education, visual art, communication skill, writing, gardening, and literature into the English instructional unit he designed. Even though Gilbert did not find any significant impact or change in outcome following the administration of the EBE model, his approach had a huge influence on my methodology.

*Place-based education: Connecting classrooms & communities by David Sobel (2004)*

Sobel, a prominent proponent of place-based education, discusses the positive effects of place-based environmental curricula on student academic performance and general wellbeing. He asserts that many of the core deficiencies of contemporary educational practices can be resolved through adopting environmental place-based curriculum in the mainstream formal school systems. Sobel describes it as:

...the process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science, and other subjects across the curriculum. Emphasizing hands-on, real-world learning experiences, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students' appreciation for the natural world, and creates a heightened commitment to serving as active, contributing citizens. Community vitality and environmental quality are improved through the active engagement of local citizens, community organizations, and environmental resources in the life of the school. (p.7)

He emphasizes in his many writings the complex pedagogical, socio-cultural and psychological dimensions of environmental place –based education for ESL students. His book titled *Place-based education: Connecting classrooms & communities* serves as a valuable theoretical blueprint for designing a multidisciplinary unit for ESL students that focuses on environmental and place-based themes. He makes several references to schools that have already implemented the interdisciplinary pro-environment curricula and how such strategies have positively impacted students' wellbeing and academic achievement. This work had a major influence on the development of my thoughts on the centrality of EE to ESL instructions.

The impact of relevant, real-life learning experiences can be life-transforming, especially for middle school students. In a world that is rapidly becoming a denatured society where gargets are the order of the day for most young children, environmentally-centered education can produce moments of enlightenment and sheer wonder for students.

*Experiencing environment and place through children's literature* edited by Amy Cutter-Mackenzie, Phillip G. Payne & Alan Reid (2011)

The edited collection of original research-based papers examines the pivotal role of children's literature and by extension, Young Adult Literature, in the formation of pro-environmental attitudes and behaviors in school-aged children. "To this end, it critically explores the value and relevance of children's literature in providing what are arguably some of the first and possibly most formative engagements that some children may have with nature" (p.1). The collection provides diverse theoretical and pedagogical frameworks and practical examples such as socio-cultural theory, artography and ecology (p.3). In addition, the collection explores and evaluates the effectiveness of practices associated with constructing writing and creating literature that is pro-environment. For example, in chapter one titled "Through Green Eyes: Complex Visual Culture and Post-literacy" by Sidney I. Dobrin, the author calls for not just a reconsideration of the visual for the purpose of interpreting information, "but toward the inclusion of textual production alongside textual interpretation as central to examining how literatures contribute to both child subject formation and the relationship between child subjects and environmental/place" (p.15). In all, the collection offers an assorted range of possibilities and insights for further scholarly research on the relationship between children's literature/

Youth Adult literature and EE, “be they pedagogical, curricular, imaginary, literary, experiential, interpretational, constitutive or otherwise” (p.10).

There are a few other studies which have tried to incorporate environmental themes in the English language curriculum such as Lori Margaret Edmond’s thesis titled *Speaking of the environment: Incorporating cultural views of nature into an ESOL education program*; however, the select works discussed will suffice for the purpose of this literature review. It is imperative to note that here in Puerto Rico, this thesis will be the first major work that attempts to incorporate EE into the ESL curriculum at the middle school level. Researchers, such as Catherine Mazak, have designed agriculture-centered English courses for ESL students at the university level; however, thematic units which align with the Puerto Rico Content Standards and Grade-level Expectations for elementary and secondary school ESL students are not currently available to the best of my knowledge.

### **The Puerto Rico Department of Education English Program Curriculum Framework**

Until the 2011 creation of the Curriculum Maps, known in Spanish as *Mapas Curriculares*, the DE did not provide English teachers on the island with a distinctive or uniformed curriculum template for the proper use of textbooks and instructional materials in the English classroom. Consequently, it was the teachers’ responsibility to determine the design, structure and content of their daily lesson plans as long as such plans aligned with the DE content standards. Specifically, the Curriculum Framework (2003) states that:

It also provides teachers with fundamental criteria when designing instruction. It is the basis that helps the teacher to make lesson content relevant while enhancing the daily learning process. It allows the teacher to innovate lessons without abandoning the general outline of the goals of education in the island, in this way, teachers select, evaluate and

design their own curriculum (instructional design) conceptualizing the learning process to the reality of the student learning styles. (p.3)

The implication is that the specifics of the instructional content in Puerto Rican public schools are within the rights of any teacher to determine as long as the basic benchmarks laid out by the DE are met. Also, the government-approved content-standards and grade-level expectations delineated key goals and objectives which form the key components of a curriculum. According to the content-standard and grade level expectation (2007), the goal is to ensure that students move beyond mere acquisition of basic language skills and toward “the mastery of higher order thinking skills, emphasizing excellence for all students” (p.13). The theoretical foundation of the instructional model advocated by the DE is ‘Balanced Literacy’ which is a comprehensive approach to language acquisition as it contains all the key components necessary for students to master both oral and written communication.

The primary objective of the Curriculum framework for the English Program is “to develop communicatively competent students in English language and to prepare students to function effectively in our socio-cultural environment” (p.22). Even though there is a strong emphasis on standard’s linguistic and cultural heritage, the DE recommends that the students should simultaneously develop an appreciable level of solidarity, respect and appreciation for the peoples and cultures as global citizens.

In order to promote excellence in education, the DE outlines the following learning-focused goals: standard driven, student-centered, literacy-focused, relationship, relevance, rigor, and achievement (p.15). To ensure that students’ gain mastery in the core standards or competence areas, the revised Content Standards of the English Program (2007) identifies the

standards which the students' assessment will be based on as- Oral Communication, Written Communication, Reading Communication, and Literacy Appreciation. The DE later changed the standards from four to three content standards: Listening/speaking, reading and writing. The main tenets of the DE- approved Standards for the English Program read:

**Standard #1 Listening/Speaking**

"The student uses the English language to interpret oral input, construct meaning, and interact with confidence both verbally and nonverbally, and express ideas effectively in a variety of personal, social, and academic contexts" (p. 41).

**Standard #2 Reading**

"The student uses reading strategies, literary analysis, and critical thinking skills to construct meaning and develop an understanding as well as an appreciation of a variety of genres of fiction and nonfiction. Read, interpret, compare analyze, and appreciate a variety of texts and styles" (p.41).

**Standard # 3 Writing**

"The students effectively communicates to a variety of audiences in all forms of writing through the use of the writing process, proper grammar, and age-appropriate expressive vocabulary" (p. 42)

In order to address the issue of vagueness and provide clearly defined strategies for curriculum design and implementation across the board, the DE released the Curriculum Maps in June 2011. Curriculum mapping highlights the need for planning to precede teaching (Wiggins and McTighe, 2011, P.67).

## **Curriculum Map for 8<sup>th</sup> Grade**

The Curriculum Map for 8<sup>th</sup> grade is divided into six units which run from 8.1 to 8.6. It forms the guiding blueprint for the lesson plans developed in this study. My overarching aim is to ensure that the entire thematic unit developed during the course of this study complies with the objectives, skills and key concepts delineated in the Curriculum Map. I will briefly highlight the salient aspects of each unit.

### *8.1: Analyzing character's Decisions (6 weeks)*

The unit is about short stories and the emphasis is on analyzing characters' decisions. The big ideas comprise "The decisions we make impact us and those around us" (8.1, p.1). In addition, how the characters' decisions help in moving the plot forward is emphasized. The editing marks are a main feature of this unit since the students are encouraged to use editing marks and reference sources to proofread, review and revise writing before submitting a final draft of their written responses. They are encouraged to adhere to the writing process as a way of improving their writing. All four standards (listening/speaking, reading and writing) are highlighted in all the units. Assessment evidence is based mainly on reading responses to the various short stories attached, 5- paragraph essays and vocabulary development among other assessment criteria.

### *8.2. Examining Transformative Decisions through Memoirs (7 weeks)*

This unit has memoirs as its main theme. The aim is to have students write their own personal memoirs depicting transformative decisions they have made in their lives. Focusing on memoirs and other personal writings to aid understanding underscores the fact that literature provides a window for us to understand ourselves as well as connect with others. Regarding assessments, students are expected to write a letter to the author of a memoir relating how they

connect with the author's life- transformation decision(s). Sample lessons and additional resources are provided to aid students' learning.

### *8.3. Influencing Others to Make Decisions that Matter to Us. (6 weeks)*

The unit is centered on the effectiveness of persuasive texts. The additional big ideas for this unit are: "We can use words to influence others" and "How we structure our arguments can make or break our points" (8.3., p.1). A performance task which serves as one of the assessment evidence for this unit is analyzing persuasive texts through the Socratic Seminar. Other assessment evidence emphasized are Decision Making Reading log, Word Wall and Word Journal.

### *8.4. Decisions that Shaped My Beliefs. (6 weeks)*

In this unit, the emphasis is on exploring "defining experiences that have shaped the students' beliefs and their outlook on life" (8.4, p.1). In addition to focusing on how the decisions we make impact us and those around us, the other 'big ideas' of this unit are: life experiences shape our personality and belief system; words are powerful and ought to be used circumspectly. Assessment evidence comprises personal essays, group work, and vocabulary acquisition, grammar- commas and semicolons.

### *8.5. Using Poetry to Express Myself (6 Weeks)*

In this unit, students are exposed to the elements of poetry in a variety of texts. The big ideas emphasized are mood in poetry/element of poetry – imagery, personification symbolism, repetition and metaphors. The Assessment evidence for this unit includes analyzing select poems, writing original poems, and creating poetry from music. Grammar forms to be taught are adverbs and adjectives.

### *8.6. Making Healthy Choices (5 Weeks)*

The unit is centered on analyzing expository texts about healthy eating. Additional big ideas for the unit are ‘setting’ in non-fiction texts, distinction between fact and opinion and lastly, reading strategies for expository texts: The outstanding assessment evidence worth emphasizing are group work, word journal, and recipe writing.

At the beginning of the 2012-13 school year when the Curriculum Maps (CM) were introduced to teachers across Puerto Rico, the vast majority had concerns about the proper application of the document. This prompted the DE to release a policy letter on the use of the Curriculum Maps. The policy letter, dated September 18, 2012, categorically states that the CM is to be used as a tool to strengthen the learning process and not as the ultimate blueprint for public school curriculum development. It underscored the fact that in planning and designing the instructional plans, the teacher is expected to take into consideration the peculiar academic needs of the students and not merely apply the strategies suggested in the CM. The teacher is expected to use any additional strategies, activities and tools which would enable students attain the content standards and grade-level expectations established in the 2007 Framework. According to the document, the use of the Curriculum Map as a complementary document for teachers only provides alternative strategies and activities aimed at promoting high levels of thinking. In essence, the Curriculum Map as a guide ensures that the students participate actively in their learning development and it paves the trajectory for the development of 21<sup>st</sup> century competencies which align with the goals of the DE.

Since the CM only provides benchmarks for teachers, it behooves ESL teachers in Puerto Rico to explore novel and innovative strategies and activities that would inspire and motivate students to meet the goals set forth by the DE. There are ample opportunities for teachers to

select themes and activities which draw students' attention to the effects of human behavior on the natural systems. Beyond affording the students the required knowledge to awaken their interest and empathy, the challenge rests in guiding them to consider making personal decisions about making a positive difference in the community. The cultivation of an engaged ecoliteracy and sound practice would take more than one instructional unit to accomplishment, so this study should be viewed as a modest seed-planting endeavor aimed at inspiring more elaborate research on eco-conscientization in Puerto Rico.

## **Chapter 3: Methodology**

### ***Introduction***

This study will use a mixed method approach which consists of a quantitative process of survey data collection and document analysis. The survey was used for the purpose of needs assessment. The document analysis was limited to the Puerto Rico Content Standards and Grade-level Expectations, as well as the eighth grade Puerto Rican Department of Education Curriculum Map for eighth grade. Taking a close look at the Puerto Rico government-authorized Content-Standards was for the purpose of determining how environmental themes can be incorporated into the existing English curriculum. In addition, the *Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning* (Lieberman & Hoody, 1998) document which underscores the Environment as an Integrating Context for Learning (EIC) model was closely analyzed to gain insight about environmentally-directed teaching and learning strategies that apply to the Puerto Rican situation.

In compliance with the standard requirement for conducting research with human subjects, an approval was obtained from the Committee for the Protection of Human Beings in the Investigation (in Spanish CPSHI/IRB) on February 26, 2012. The basic idea behind the use of a questionnaire which serves as the quantitative component of the study was to assess and determine what a select group of eighth graders in a given middle school in Mayagüez, Puerto Rico knows about environmental issues and how such knowledge may have impacted their attitudes and behavior with regards to various environmental issues. This aspect of the study which centers on the qualitative analysis of the Curriculum Map for eighth grade was crucial in order to explore ways in which environmental literacy can be incorporated into the existing English language curriculum in Puerto Rico.

The goal was to design an English language instructional unit which uses the “Environment as an Integrated Context for Learning” (EIC) as a guide in creating thematic lesson plans that adopt innovative instructional materials and activities.

## **Data Collection**

### **Research Site and Participants**

The decision to use a multi-method approach was based on the need to ensure validity and credibility given the richness of the topic under investigation. Since the main thrust of the study was to design a thematic approach to green English for eighth grade, the data collection from participants was limited to the student questionnaire. It was a non-probability sample which involved three groups of eighth graders in a particular middle school in Mayagüez.

It was a convenience sampling because the respondents were students at the school where I teach eighth and ninth grade English language. A total of sixty-three eighth graders were invited to participate in completing the questionnaire. In the end, only sixty students participated in the survey. A student’s parents indicated they did not want their ward to participate in the study, while two students were absent on the day the questionnaire was administered. According to Cohen Cohen, Manion, & Morison (2007), the advantages of the questionnaire over interviews include the fact that it is often more reliable since it is anonymous and encourages greater level of honesty; also, it is less expensive in terms of actual time and money spent on the process.

Forty-one of the participants are my students. The participants were between the ages of 13 and 14. They comprised both male and female students and were classified as basic, intermediate and advanced students in English proficiency based on their performance on the Puerto Rican Standardized Test. Their socio-economic status ranges from mostly poor to middle class. All the students are Hispanic, so they have a shared cultural and linguistic identity.

They do not represent the wider population, so the possibility of generalizability in the study is quite negligible. The interpretative analysis of the eighth grade Curriculum Map (CM) and the EIC model provided me with sufficient insight necessary to design high-quality lesson plans which highlight environmentally-relevant topics using the general curriculum guidelines for eighth grade English language education.

The IRB approved the accent and informed consent forms (Appendix A and B) were distributed to the students for their parents' and their signatures before the questionnaire were be administrated.

## **Instrument**

### **Questionnaire**

A questionnaire, available in both English and Spanish (Appendix C and D), was used to collect the necessary data for the study. The questionnaire was in Spanish for easy comprehension by the vast majority of the students; however, an English equivalent was available in case some students opted to answer the questions in English.

The purpose of this instrument was to collect information pertaining to the students' knowledge, attitude and behavior with respect to environmental awareness. A thorough appraisal of the students' environmental literacy, attitudes and behavior helped me identify the environmental concerns to be emphasized in designing thematic lesson plans in compliance with the standards set forth by the department of education in fulfillment of the English Program requirements. In essence, the select topics highlighted in the questionnaire were carefully chosen to ensure that the broader objectives of the eighth grade curriculum were achieved. Furthermore, the information from the survey helped me focus on the issues that the students are interested in as well as salient environmental concerns that they may lack basic knowledge of.

The questionnaire served as an appraisal of the students' environmental literacy, attitudes, and behavior which in turn directly influenced the selection of topics for the thematic lesson plans I designed during the course of this study.

Questions 1-5 were on the environmental literacy component which sought to determine the level of prior knowledge about environmental concerns that the students come into the English language classroom with. These concerns included issues relating to environmental pollution, energy conservation, global warming, and animal rights. The first three questions were open-ended in order to gain a richer understanding of the students' cognitive skills in their evaluation of environmental issues.

Questions 6-11 were for the purpose of soliciting information about the attitudes of the students with respect to environmental issues. Topics associated with environmental attitudes included the students' opinion about nature writing; nature reading; outdoor education; advertising impact on environmental attitudes; recycling and conservation of electricity.

Regarding students' behavior with respect to environmental issues, questions 12-15 asked about hours spent outdoors on non-school days; compost generation; gardening-related activities; and energy consumption habits.

I made the decision to use a Likert scale to solicit the information for easy compilation of the results. In one instance, the Likert scale used ranges from A-E with A meaning ALWAYS and E meaning NEVER. Also, I used another Likert scale which ranges from A-E with A meaning STRONGLY AGREE and E meaning STRONGLY DISAGREE. I decided to include C meaning UNDECIDED to provide the students with the freedom to give a neutral response in the event that they did not have any strong feelings or opinion about any of the items on the questionnaire.

While the questionnaire sought to evaluate students' prior knowledge, the primary focus was on improving the students' writing, reading, speaking and listening skills. To accomplish this objective, I concentrated on persuasive essay writing and speaking; reflective personal narratives; reading comprehension; grammar; and poetry. In order to provoke a genuine appreciation for English language, this study sought to empower students by connecting the ideological and structural dimensions of all classroom practice to their socio-economic and environmental determinants both in the lives of the students as well as in the wider society.

### **Procedure**

The administration of the questionnaire required me to seek approval from the superintendent of schools in Mayaguez by submitting the required paperwork. As soon as the study was approved, I sent a copy of the signed approval to the director of the relevant middle school in Mayaguez where I distributed the questionnaire.

For the purpose of collecting data, the questionnaire was administrated at the same time to all the three eighth grade groups at the school for twenty to twenty-five minutes during regular school hours on a given date. It took a typical sixth grader from another school eleven minutes to answer similar questions, so the time allocation was adequate.

The other eighth grade English teacher at the school was notified about this procedure in advance, so the teacher was able to make necessary adjustments to his/her lesson plan for that day. It was expected that the sixty students will answer all the questions from the fifteen-item questionnaire.

Data collection involved a thorough analysis of the current eighth grade Curriculum Map in order to determine how environmental literacy can be incorporated into the existing document. The analysis of the CM was guided by the following principal questions:

- 1) What are the major content goals established in the eighth grade curriculum?
- 2) Given the big ideas that the students need to explore through inquiry, what types of assessment tools that draw attention to enduring environmental concerns can be generated to ensure that the students' grasp the big ideas?
- 3) Based on the scope of the six units delineated in the eighth grade CM, how can environmental literacy topics, activities, and readings be incorporated into the existing curriculum?

### **Data Analysis**

The results of the questionnaire were meticulously tallied by studying and coding the answers on the open-ended questions. The coding criterion was for the purpose of determining common responses and counting the results for each group of common responses. The data from the multiple-choice questions was tallied by counting the answers and determining their percentages. The results from the data collection were organized in tables and charts for easy access to the results. The analysis of the data collected from the questionnaire reflected the knowledge base, attitudes, and behavior of the students with respect to environmental literacy.

## **Significance of Study**

In a world which faces fundamental environmental and ecological challenges, it is imperative for the educational community to explore every possible means which will lead to raising an ecologically/environmentally informed generation of young people. Emphasizing our intimate connection to the environment and the need to be actively involved in preserving it for not only our generation but future generations is a task for all disciplines, particularly English language studies, because it typically spotlights and analyzes enduring issues pertaining to the human experience.

Interestingly, the theme of the eighth grade Curriculum Map as established by the Department of Education in Puerto Rico is *Making Decisions* which is pivotal because middle school students are at a crucial age in their social and cognitive development where they are making attitudinal changes and imbibing liberating worldviews about their place and role in the world. Given that on September 18, 2012, the Department of Education sent out a policy letter, known in Spanish as *carta circular*, in which the government emphasized that the CM is only a guide and not a rigid formula, I believe there is room for a study, such as this, that seeks to incorporate issues which could require the students to make life-altering decisions. The policy letter indicates that teachers can adapt the CM to their preferences and incorporate any relevant themes which align with the overall objectives and standards delineated in the CM. Without a doubt, environmental education is compactable with the eighth grade CM which is centered on how the decisions we make affect our lives and those of other people around us; the crux of the study was to explore how focusing on environmental issues in the English language classroom can help eighth grade students gain the relevant and practical knowledge and skills necessary to make proactive decisions. Such decisions could include engaging actively in environmental

stewardship and agency which has the potential of positively affecting students' overall wellbeing as evidenced in various studies cited in the literature review.

Creating an engaging learning environment is central to achieving positive learning outcomes. Holownych (2010) indicates that there is a significant increase in students' interest and engagement in learning English when environmental education content is added to the ESL curriculum. He goes on to maintain that the focus on the environment affords students meaningful and practical ways to explore the richness of the English language.

Given that environmental challenges are prominent issues affecting people across the world, it is hoped that the instructional unit to be developed during the course of this study will foster in young students a deeper understanding and appreciation of our connectedness to the global community in the search for solutions to enduring environmental problems. As Cate (1997) says, "all teachers have a responsibility to help everyone in this world communicate with each other to prevent the global disaster..." (p. 2). Making classrooms across the board centers of critical thinking and inquiry-based learning about the environment should be the primary focus of educators at all levels if our generation is to avert a global catastrophe.

The powerful mix of personal stories with crucial environmental and social issues is a call to action for young readers. Eighth graders in typical Puerto Rican schools are not being afforded environmental education from a multidisciplinary perspective and this study seeks to correct that anomaly as a starting point. However, more research needs to be done in this area in order to explore ways of enhancing students' environmental literacy and advocacy.

## **Chapter 4: Results, Analysis, and Discussion**

### ***Introduction***

One of the central objectives of this research was needs analysis which assesses the students' environmental ecological knowledge, environmental stewardship attitudes, and behaviors- the three areas that the questionnaire focused on. This chapter will present, analyze, and discuss the research question one, as well as the first part of research questions two, and three.

The results of the questionnaire hugely influenced the selection and design of topics and activities for the instructional plans in the next chapter. Sixty out of the sixty three students who were approached for the purpose of completing the questionnaire actually completed the questionnaire.

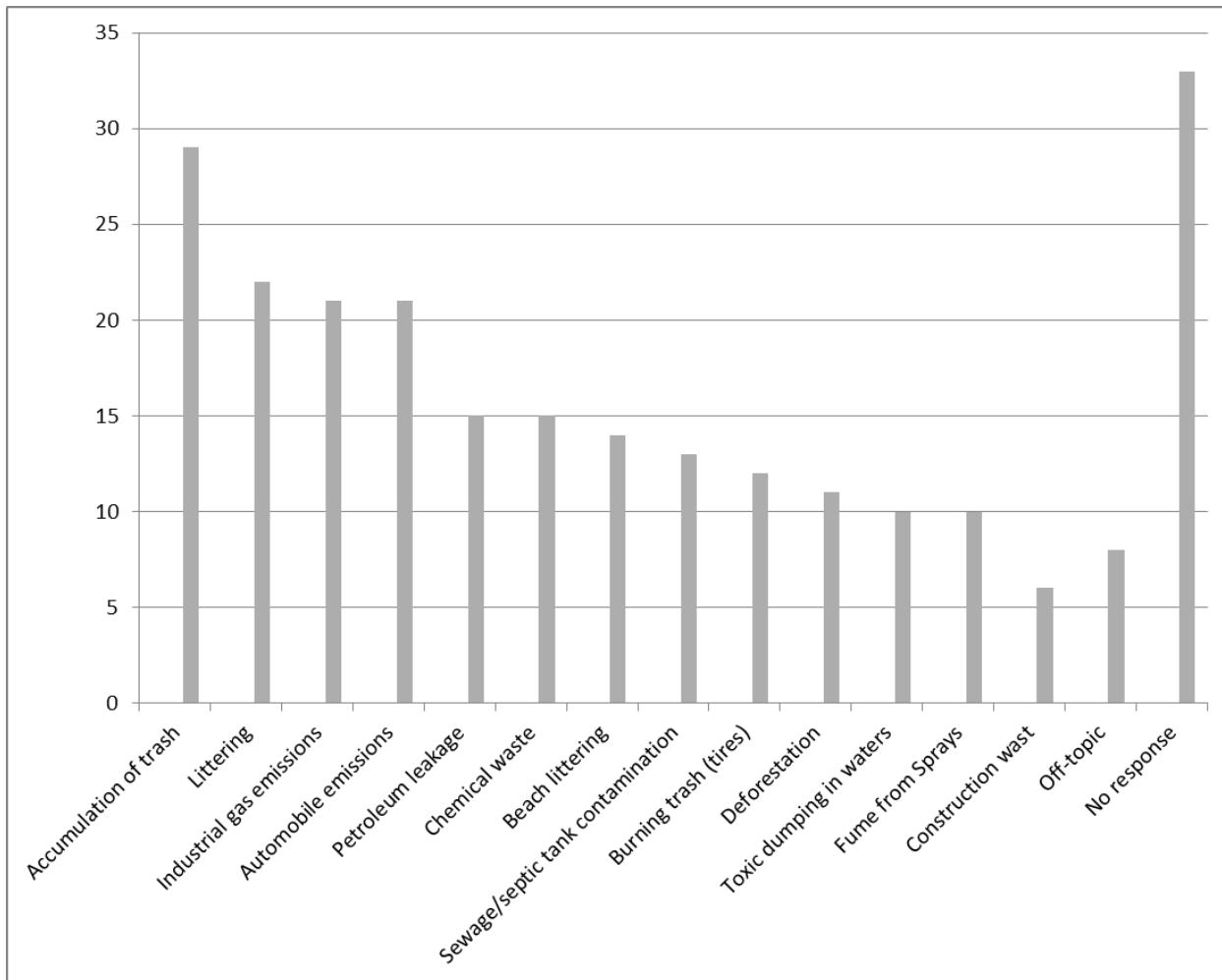
Descriptions of the results are presented first, and are immediately followed by the analyses of the data. The basic assumptions guiding this research were that: (1) Focusing on Environmental education topics in an ESL/EFL class will improve the students' interest in learning the target language, and (2) Teaching EE in a non-traditional setting will positively impact students' environmental attitudes, values, and behaviors.

### **Part I**

#### **Research Question One: What does a representative group of eighth grade students from a school in Mayaguez (Puerto Rico) know about environmental themes?**

As earlier indicated, the questionnaire was divided in three parts: Environmental Knowledge (Items 1, 2, 3, 4, and 5); Attitudes of students towards environmental topics (items 6, 7, 8, 9, 10, and 11); and Behavioral intentions of students with regards to pro-environmental stewardship (12, 13, 14, 15). (N-240)

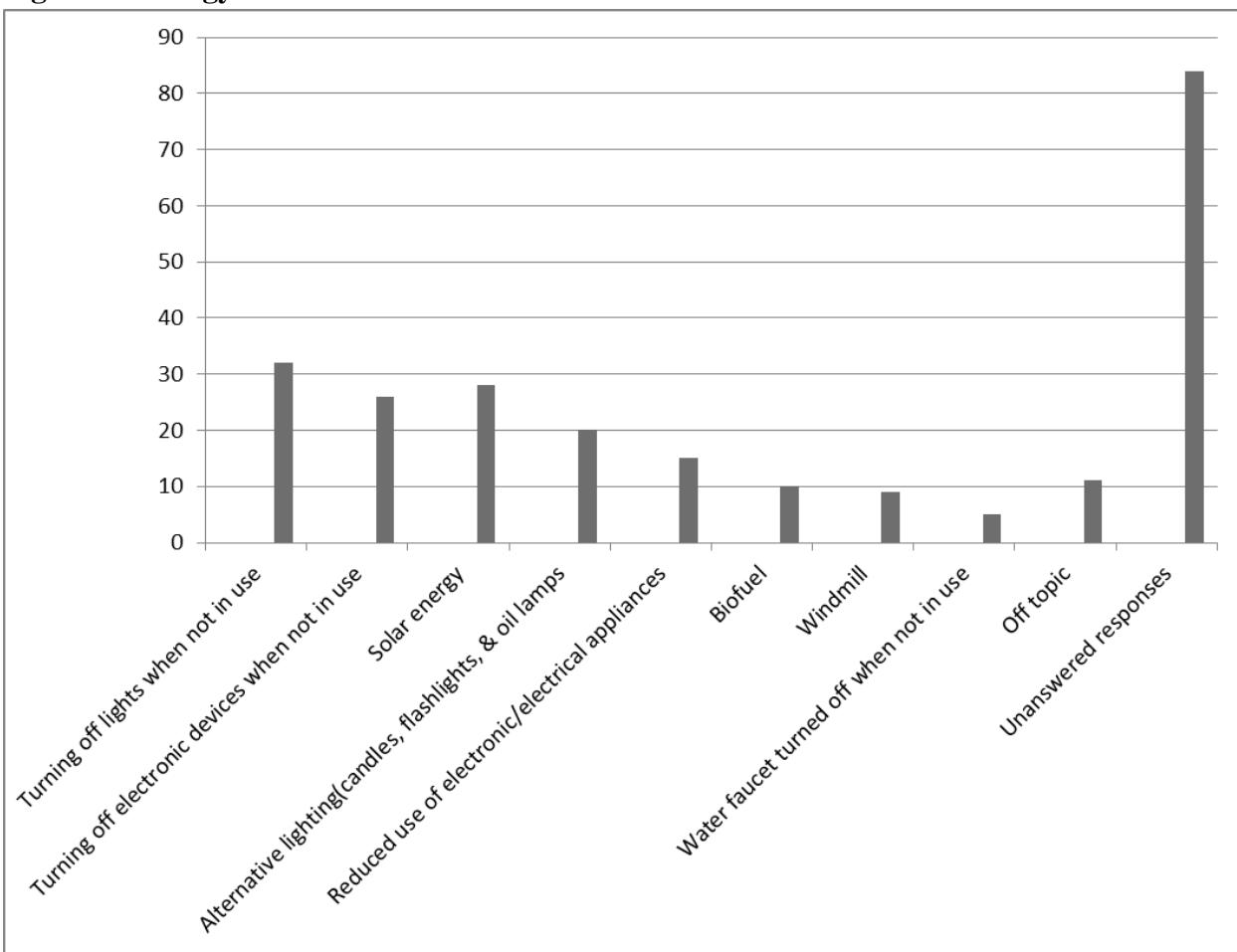
**Figure 1: Causes of Environmental Pollution**



The first item on the questionnaire assessed students' knowledge of the causes of environmental pollution. They were free to focus on any discharge of substances or material on land, air, or water that could potentially result in the further degradation of the environment or have adverse effects on people/animals' quality of life. Each student was required to mention only four causes of pollution. Majority of the students, i.e., eighty three percent (83 %) gave valid answers to the questionnaire as can be seen in Figure 1. Eight out of sixty students, who represent 14% of the population, left the question unanswered which could be interpreted to mean they did not know the answers to the question. Also, 3% of the students gave incorrect answers to the question. According to the DE Standards and Grade level expectations for science

and social studies, environmental pollution should be taught beginning from first grade to high school; it is expected that this group of eighth graders have been taught the fundamentals of environmental conservation and causes of pollution in the lower grades. For example, the Department of Education Content Standards and Grade-level Expectations for Science (2007) stipulates in (C.K.3.9.) that one of the third grade expectations should be “evidence to demonstrate environmental awareness on recycling, pollution and conservation” (p.16). The significant percentage of students who were unable to answer raises the question of whether the instruction they received over the years nurtured the expected environmental understandings, attitudes, values and behaviors.

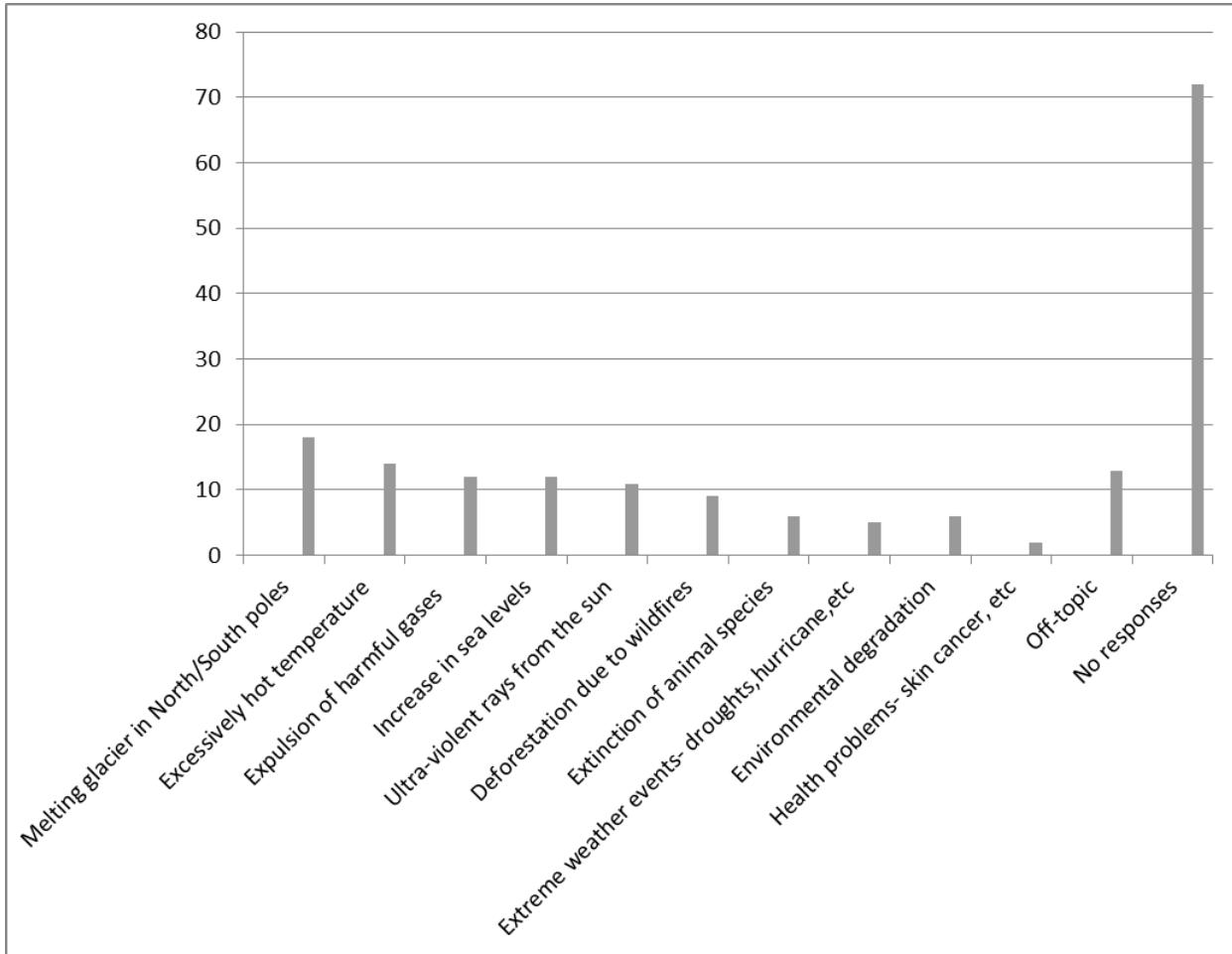
**Figure 2: Energy Conservation**



The second item on the questionnaire evaluated the students' knowledge of Energy Conservation. As shown in Table 2, only 60% of the students gave valid responses to the question. About 5% gave incorrect answers which were unrelated to the question asked. It is important to note that 35 % of the participants did not respond to the question. Of the twenty one students who left the question unanswered, eight wrote, "No se", which is Spanish for "I do not know". Given the fact that the DE approved Content Standard and Grade-Level Expectations for Social Studies and Science identify the conservation of natural resources as one of the major Content Standards for K-3, as well as Seventh to Ninth Grade, it is worrisome to note that more

than one third of the students could not provide answers to a question that required them to identify four ways of conserving energy and avoiding waste of vital resources.

**Figure 3: On Global Warming**



The third item in Part 1 of the questionnaire required students to mention three effects of global warming. It turned out to be the most challenging for this group of eighth graders because only 53% of the respondents gave correct answers to the question. As reflected in the Figure 3, 40% of the students failed to provide correct answers to the question, while 7% gave incorrect answers to the question. According to section G of the DE Curriculum Framework for Social Studies (2000), Global Warming should be taught in fourth to sixth grade. The significant numbers from this data suggest that a considerable percentage of students have limited

knowledge of environmental issues and problems. If students are to be encouraged to cultivate pro-environment attitudes and values, they need to acquire basic knowledge of fundamental EE. The effects of global warming is fundamental to environmental literacy and except there is a clear awareness of the effects of human behavior on natural systems and climate change, it would be difficult to raise a new generation that will have sharpened ecological and environmental sensibility.

**Table 1: Animal Rights**

**Question 4. Animals are not as important as human beings, therefore they should not have rights.**

SA	A	UN	D	SD	NR
2	0	7	19	31	1
3.33%	0.00%	11.67%	31.67%	51.67%	1.67%

The fourth item in this section of the questionnaire was a multiple choice question. The possible response choices were from A – E, with ‘A’ standing for (strongly agree), and ‘E’ standing for (strongly disagree). The question was about the rights of animals. Only 3% of the respondents thought animals do not deserve any rights because they are not as important as human beings. Precisely 12% of the students did not have an opinion about whether animals should be accorded rights of their own. This question is crucial to the sustenance of ecological balance because the consequence of not having significant animal rights laws would be the loss of biodiversity. Nevertheless, it is important to note that 84% of the respondents either disagreed or strongly disagreed with the suggestion that animals do not deserve rights because they are not

as important as humans. It is a positive outcome which indicates that majority of the students are aware of the importance of animal rights.

**Table 2: Environmental Crisis**

**Question 5. There is no such thing as “environmental crisis” because nature is tough enough to withstand any negative threat or abuse.**

SA	A	UN	D	SD	NR
4	3	15	20	16	2
<b>6.67%</b>	<b>5.00%</b>	<b>25.00%</b>	<b>33.33%</b>	<b>26.67%</b>	<b>3.33%</b>

In the fifth and last term in the knowledge segment, students were asked about “Environmental Crisis”. In response, 12% of the students either strongly agreed or agreed there is no such thing as “environmental crisis” because nature is tough enough to withstand any negative threat or abuse. Table 5 shows that one quarter of the respondents (25%) were undecided about whether “environmental crisis” is a fact or fiction. Only 60% indicated environmental crisis is a reality in today’s world. The numbers lend support to the need for a more compelling approach to the EE that both challenges and engages students cognitively, physically, and emotionally.

Responses to the items in the Knowledge Section of the questionnaire suggest wide ranging knowledge among the students. Many of them demonstrated knowledge of the various environmental concepts that were emphasized; however, a significant percentage of the students have insufficient knowledge of compelling environmental issues of this age. In the school where the research was conducted, outdoor education is not an option, so students are taught most concepts using old pedagogical methods. This is true of most public schools in Puerto Rico

where obtaining official authorization to take the students outside of the school environment or classroom setting can be an onerous task. Undoubtedly an engaging action-oriented participatory learning of fundamental environmental concepts and theories should incorporate outdoor education and hands-on activities.

## PART II- ATTITUDE

**Research Question #2. What are the attitudes of a group of eighth grade students regarding environmental themes? How can environmental/ecological themes be integrated into the existing Curriculum Map for eighth grade?**

**Table 3: Nature-related Activities**

**Question 6. Do you enjoy activities that involve drawing, painting and writing creatively about nature-related topics?**

Always	Often	Sometimes	Rarely	Never	NR
8	10	24	13	4	1
<b>13.33%</b>	<b>16.67%</b>	<b>40.00%</b>	<b>21.67%</b>	<b>6.67%</b>	<b>1.67%</b>

The sixth item in the questionnaire attempted to measure respondents' attitude to nature-centered English class activities such as drawing, painting, and writing about nature-related topics. Given the importance of cultivating environmental and ecological sensibility, the question was geared in the direction of ascertaining students' attitude to a multi-dimensional approach to eco-literacy.

It is noteworthy that while a majority of the students- 70% indicated that they enjoy such activities to varying degrees, 29% indicated a disapproval of such an approach to eco-conscientization in an English class. Two out of the sixty students who participated in the survey

did not respond to the question. Based on the responses to this question, it could be argued that the majority of the students are favorably disposed to a pedagogical approach to eco-consciousness which incorporates multiple forms of intelligence as proposed by Gardner (1983). It can be deduced that the inclusion of visual arts and nature writing in an ESL context is valued and welcomed by the students since it is a way of recognizing the wide range of their capabilities and individual differences.

**Table 4: Environment and Literature**

**Question 7. Reading literature books and stories that focus on planting, such as Seed folks (Leona) in the English class, would improve your understanding of the different aspects of planting.**

SA	A	UN	D	SD	NR
9	21	24	3	2	1
<b>15.00%</b>	<b>35.00%</b>	<b>40.00%</b>	<b>5.00%</b>	<b>3.33%</b>	<b>1.67%</b>

This item is closely related to item #14 on the questionnaire. About half of the students responded with the answer “strongly agree” or “agree” in favor of the assumption that eco-centered literature could potentially improve their understanding of biophysical processes, especially planting.

Interestingly, 40% of the students answered “undecided” in response to this item, which could mean that they are not accustomed to reading about nature and therefore may not be able to relate to it. Also, several of them may have answered in the middle or neutral because they do not have strong feelings about the issue one way or the other. The high percentage of “undecided” responses could equally be the direct consequence of some respondents wanting to

simply get through the survey and so chose “undecided” to complete it as quickly as possible. Literature brings to life a wide range of experiences of environments and people’s connection to nature; consequently, exploring and experiencing environment through literature is crucial to the formation of eco-consciousness.

**Table 5: Outdoor Education**

**Question 8. Outdoor education inspires environmental responsibility in students.**

SA	A	UN	D	SD	NR
25	19	12	2	1	1
<b>41.67%</b>	<b>31.67%</b>	<b>20.00%</b>	<b>3.33%</b>	<b>1.67%</b>	<b>1.67%</b>

As expected, majority of the students agreed that outdoor education inspires environmental responsibility in students. Only 4% disagreed with that assumption. As suggested by Andrejewski (2011), the acute “lack of exposure to the natural world has led to a generation of children disconnected from nature” (iii). Here in Puerto Rico, pedagogical processes rarely include outdoor hands-on learning with a social ecological slant. The responses suggest that engaging actively and meaningfully in authentic outdoor learning experiences could impact students positively and help them internalize the pertinent concepts. It is possible that they feel that way because a non-traditional approach is an added incentive to pay more attention to the content of instruction.

**Table 6: Advertising**

**Question 9. Advertising creates artificial needs to make you buy things that you do not need.**

SA	A	UN	D	SD	NR

18	14	19	7	1	1
<b>30.00%</b>	<b>23.33%</b>	<b>31.67%</b>	<b>11.67%</b>	<b>1.67%</b>	<b>1.67%</b>

When asked whether they agree with the claim that advertising often creates artificial needs to induce a sense of lack in consumers, a little over half of the students agreed with that point of view (See Table 9). The abundance of commercials targeting young people makes it increasingly challenging to adhere to the 3R (recycle, reuse, and reduce) principle. It is noteworthy that 47% indicated no reservations at all with respect to commercialization aimed at embellishing lack and inducing a sense of inadequacy in people. Conscious change of attitude is predicated on accurate knowledge and awareness of the excesses of advertisements targeted at young people. The green ESL curriculum proposed in this research will focus on fostering critical awareness and cognitive skills in students as that will enable them to make reasoned decisions and cultivate the right responses to excessive advertising targeted at young people.

### PART III- BEHAVIOR

**Research Question #3. What are the behavioral patterns of a group of eighth grade students regarding environmental engagement?**

**Table 7: On Recycling**

Question 10: I recycle my plastic, aluminum cans, paper and glass

Always	Often	Sometimes	Rarely	Never	NR
8	2	21	13	15	1
<b>13.33%</b>	<b>3.33%</b>	<b>35.00%</b>	<b>21.67%</b>	<b>25.00%</b>	<b>1.67%</b>

This item assessed both the attitude and behavior of students with regards to recycling. Only 17% indicated that they recycle always or often. Meanwhile, the Content Standard C.3.3.3 prescribe that science education should suggest possible solutions to environmental problems such as recycling, reusing, and waste management in order to maintain a healthy environment. (Content Standards and Grade-level Expectations for the Science Program, 2007, p.42). The 47% who indicated they either rarely or never recycle have not been positively impacted by any knowledge they may have acquired over the years about recycling. Presenting instructional materials on recycling in a way that inspires students to want to apply themselves to recycling as a lifestyle is one of the central challenges of designing the lesson plans for the next chapter.

**Table 8: On Exploring Solar Energy**

**Question 11: We dry our clothes outside or on cloth racks inside the house.**

Always	Often	Sometimes	Rarely	Never	NR
35	9	6	6	3	1
<b>58.33%</b>	<b>15.00%</b>	<b>10.00%</b>	<b>10.00%</b>	<b>5.00%</b>	<b>1.67%</b>

A majority of students- 83% answered that they line-dry their clothes in the sun or on indoor racks. Making good use of natural resources is a recurring content-standard throughout grade school; therefore, exploring new methods of engaging students in intellectual dialogues that will facilitate proper and responsible action will be the thrust of the instructional materials and options in the next chapter. The key, as explained in the literature review, is to focus on the positive effects of line drying on household budgets and finances.

**Table 9: Outdoor****Question 12: How much time do you spend outdoors on a typical day?**

>1hr.	1-2 hrs.	2-3hrs.	4<hrs.	NR
13	9	15	21	2
<b>21.67%</b>	<b>15.00%</b>	<b>25.00%</b>	<b>35.00%</b>	<b>3.33%</b>

This item, like item #8 on the questionnaire, sought to assess the behavior of students with regards to spending time outdoors. A considerable number of students (22%) indicated they spend less than one hour outdoors on a typical day. As stated in the literature review, there are numerous attitude-based and experience-based benefits to out-door education and it will feature prominently in the engaged action-oriented instructional plans which will be explored in the next Chapter.

**Table 10: Compost Generation****Question 13: I save my vegetable and fruit waste as compost.**

Always	Often	Sometimes	Rarely	Never	NR
3	3	11	12	29	2
<b>5.00%</b>	<b>5.00%</b>	<b>18.33%</b>	<b>20.00%</b>	<b>48.33%</b>	<b>3.33%</b>

Composting as a form of recycling does not appear to be popular among the students who responded to my questionnaire. Only 10% of the respondents answered that they save their vegetables and fruits scrapes as compost. Another 18% indicated they recycle their organic waste sometimes. A significant percentage of the students never recycle their leftover food scraps that would typically end up in a landfill somewhere in the world. Composting in school and outside of school provides an excellent opportunity for fostering environmental consciousness in

students as well as teachers. With regards to my third research question about the behavioral patterns of the group of eight grade students regarding environmental engagement, composting, particularly vermiculture, is definitively not an activity which the students are accustomed to; however, incorporating it into the ESL context provides ample opportunities to explore journal keeping, games, group work, and much more.

**Table 11: Participating in Gardening-related Activities****Question 14. I participate in gardening-related activities.**

Always	Often	Sometimes	Rarely	Never	NR
4	4	14	13	23	1
<b>6.78%</b>	<b>6.78%</b>	<b>23.73%</b>	<b>22.03%</b>	<b>38.98%</b>	<b>1.69%</b>

Gardening is another item in the questionnaire that majority of the students revealed they do not participate in regularly. Only 14% responded that they always or often engage in gardening. Another 24% indicated they engage in gardening activities some times. A lot of subject areas can be incorporated into a unit on gardening.

**Table 12: Turning off lights and electric-powered electronics****Question 15. I turn off the lights, television, laptop, computer, and other electricity-powered electronics when they are not in use.**

Always	Often	Sometimes	Rarely	Never	NR
24	19	11	3	2	1
40.00%	31.67%	18.33%	5%	3.33%	1.67%

The responses to the item were very pro-environment. About 90% responded that they turn off lights and electrical appliances when not in use. Unlike item #3, which measured students' knowledge of energy conservation, the item was designed to assess their behavioral pattern with respect to conserving energy on a daily basis. Creating lesson plans and instructional materials which help students explore how they can further reduce their daily energy

consumption could go a long way in grooming individuals who have realistic and sustainable energy solutions for the 21<sup>st</sup> Century.

In all, the data from the students was very revealing. It uncovered students' knowledge, attitudes and behavior with respect to EE. It is imperative that ESL teachers enhance students' creativity, critical thinking skills, and engagement through interdisciplinary approaches to learning. Obviously, such approaches are not limited to the incorporation of EE into the ESL class. EE is only one content-area which can be integrated into the language curriculum in order to have students commit themselves to meaningful use of language about our biophysical environment and how to be responsible custodians of it for ourselves and future generations. The next chapter will focus on designing learner-centered lesson plans which provide enriching resources and activities that will stimulate students' critical and reflective thinking through hands-on, minds-on, question-centered models.

## **Chapter 5: Green Options**

### ***Introduction***

The collection of lesson plans in this chapter offer multiple paths to integrating the EIC model in the Puerto Rican eighth grade English curriculum. The overarching purpose of the chapter is to the advancement of all four competency areas of language: listening, speaking, reading and writing. This is accomplished by focusing on content and meaning rather than specific linguistic forms. In this case, the content will be centered on EE in order to promote it as an important aspect of balanced education for a world in crisis.

Even though preference is given to environmental resources with local content, cross-cultural readings are also included in the collection in an effort to foster understanding and appreciation of multiculturalism. The CM equally recognizes this crucial aspect of middle school education which explains why several readings included in the eighth grade CM have a multicultural component to reflect our increasing interconnectedness.

Grammar is conspicuously excluded from the lesson plans because it features extensively in the CM for all the grades, including eighth grade. To avoid duplicity, the lesson plans will reflect what is lacking in the existing CM which are materials and activities that promote pro-environmental consciousness. The study sought to compliment the CM and not be a replacement for it, which is why grammar is not included in the lesson plans developed. Developing topics and activities which facilitate students' learning about environmental issues was the main focus of this study. The concerted integration of environmental issues is expected to inspire students and provide ample opportunities for them to gain competency in all three areas of competency- Listening, Speaking, Reading and Writing.

This collection of fifteen lesson plans has the following goals:

- The development of language skills including listening, speaking, reading and writing.
- To expose students to environmental themes and problems.
- To foster hands-on, minds-on, exploratory learning.
- The acknowledgement of students' background knowledge as a springboard to critical engagement.
- To encourage creativity through reflective and creative thinking and writing.
- To recognize and enhance multiple intelligences through arts, crafts and role playing.
- To ensure that each lesson aligns with the vision and mission of the English program and the CM.
- To engage the students by providing variation in procedural techniques.

***Lesson Plan Template***

**1. Compatible with Curriculum Map Unit:**

**2. Environmental Theme:**

**3. Topic:**

**4. Big Picture:**

**5. Essential Question:**

**6. Reflection:**

**7. General Strategy:**

E.C.A                      Phase:  Exploration  Conceptualization  Application

**Reading Trilogy**      Phase:  Before             During             After

**8. Curriculum Connection:**       Spanish       Science       Technology

Physical Education       Agricultural Science

**9. Expectations:**

**10. Depth of Knowledge:**

Recall (I)     Skill/Concept (II)     Strategic Thinking (III)     Extended Thinking (IV)

**11. Operational Objectives:** Throughout several activities the student will be able to:

**Conceptual:**

**Procedural:**

**Attitudinal:**

**12. Assessment Techniques:**

**13. Activities:**

**Initial:**

**Development:**

**Closing:**

**14. Materials:**

**15. Extended Activities:**

### ***Lesson Plan 1: Energy Conservation***

- 1. Compatible with Curriculum Map Unit:** 8.6- Making Healthy Choices
- 2. Environmental Theme:** Energy Conservation
- 3. Topic:** Expository Text- Energy Conservation
- 4. Big Picture:** The decisions we make impact us and those around us / Characters' decisions advance the plot (CM)
- 5. Essential Question:** What can I do to conserve energy at home?

#### **6. Reflection:**

“Conservation means the wise use of the earth and its resources for the lasting good of men.”

Gifford Pinchot

#### **7. General Strategy:**

**E.C.A**                   Phase:  Exploration  Conceptualization  Application

**Reading Trilogy**      Phase:  Before            During           After

#### **8. Curriculum Connection:**       Spanish Science Technology

#### **9. Expectations:**

**L/S.8.1** Analyze the text, establish purpose, identify author's purpose, and distinguish text features to enhance comprehension.

**R.8.5** Distinguish between fact and opinion in narrative and expository texts; states and paraphrases main idea or topic, and determines important details.

**W.8.2.** Classifies and applies the parts of speech, uses vocabulary, accurate spelling, appropriate grammar and syntax in writing.

**10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objective:** Throughout several activities the student will be able to:

**Conceptual:** During a read aloud of the comprehension passage- “Energy Conservation”, the students will analyze the text and identify the author’s purpose.

**Procedural:** As a way of encouraging students to tap from prior knowledge, students will verbally discuss how we can conserve energy at home. After reading Energy Conservation, students will answer questions about the text, and then complete a crossword puzzle which features words from the text. For extended practice, students will keep a daily Energy Use Journal for one week; they will share some of their entries with the rest of the class at the end of the process.

**Attitudinal:** Through their active participation in class discussions and read-aloud sessions, students will demonstrate awareness of the need to conserve energy.

**12. Assessment Techniques:** Reflection & Journal Keeping

**13. Activities:**

**Initial:** The class will begin with the students making a connection to self as they orally discuss the reflection for the day. This will go on for ten minutes.

**Development:** Students will volunteer to read sections of the text titled, “Energy Conservation”. At intervals, the teacher will require students to suggest ways in which they can implement the ideas suggested in the text in their daily lives. Students will answer the comprehension questions.

**Closing:** Students will use five key words from the reading to make complete sentences.

**14. Materials:** Graphic Organizer- “Plants Are Our Friends” is an excerpt from the book- Kid’s Herb Book by Leslie Tierra Projector, Worksheet, Notebooks

## **15. Extended Activities:**

### **1a. Energy Use Journal**

Increase student awareness of their energy use.

Have students create a Journal of their daily energy use for one week. Give the students some guidelines such as how you want the journal to look, and what would be in it.

They will give updates daily as they share some of their entries with the rest of the class.

At the end of the week, discuss the journals as a class:

- Did they find their energy habits changing at all as a result of this exercise?
- What opportunities do they see that they have to conserve energy in their daily lives?

Have them organize the daily journals into two headings:

- “Energy I Used”
- “Energy I Saved.”

Have students share their efforts to save energy, and share some of your own. Recognize and encourage their conservation efforts.

(Adapted from: <http://energyclassroom.com>)

### **1b. School Newsletter/Magazine with A Pro-environment Thrust**

For the purpose of extending the learning process and enlightening other students on energy conservation, the students will work in groups to create an English newsletter/magazine for school-wide circulation.

The Newsletter will feature:

- Practical home-energy saving tips
- Pro-environment poems

- Testimonials of heroes of the environment
- Interview with one of Mayaguez's environmental activists
- Advice Column
- Pro-environment Book Review corner
- Movie Corner featuring pro-environment movies/documentaries
- An editorial piece by a pro-environment teacher
- Energy conservation crossword puzzles and short cartoon strips

### **1c. ‘We Are Involved’ Public Service Announcement**

Students will work in groups to create a public service announcement in order to influence people’s behavior with regards to energy conservation. Use persuasive writing techniques to promote your cause.

## **Reading Comprehension: Energy Conservation-** Crown Financial Ministries

Americans have taken for granted instantaneous and reasonably priced energy for two generations. Flip on the switch and the lights turn on; turn the knob on the gas or electric oven and it begins to heat; stop at the gas station and fill the car's gas tank. Only occasionally have there been inconveniences—specifically, World War II rationing and the energy crisis during the 1970s.

Although petroleum consumption has increased 42 percent over the past 30 years, supply has increased only 8 percent. Half as many oil refineries are operating today than were operating in 1970, and not a single new oil refinery has been built in 25 years. This naturally results in increased energy prices. In order for the average American family to keep pace with increased energy prices, they must adopt a lifestyle of energy conservation.

### **Air conditioning**

- Make sure window air conditioners are properly sized. An oversized unit will use more energy. Choose a window unit that will cool one room only.
- Change or clean air conditioning filters monthly during peak cooling season.
- Set your central air conditioning thermostat on the highest comfortable setting. Raising the temperature just 2 degrees will reduce cooling costs by 5 percent.
- Make sure supply and return air registers are not blocked by furniture or drapes.
- Reduce air conditioning use by preparing oven-cooked meals in the cool of the day.

When it's time to eat, reheat the entrée in a microwave or toaster oven.

- Turn off unnecessary lights when air conditioning is on.

### **Heating**

- Buy heating oil and firewood, if applicable, during the off-season. Lowest prices for both are generally between July and September.
- During winter daylight hours, open all window drapes and window coverings on the side of the house that is receiving the most sunlight. When the sun goes down, close window coverings and drapes.
- If you live near one of our country's national forests, most give up to six cords of firewood free per family. Check with your regional U.S. Forest Service office. Do not try to gather wood without permission; it is illegal.
- Each degree the thermostat is set below 70 degrees decreases your heating bill by 2 to 3 percent. Ideally, keep the thermostat at 65 degrees during the day and 60 degrees at night.
- Don't let heat or air conditioning escape up the chimney. Keep the damper closed when fireplace is not in use.
- A programmable clock-operated thermostat will pay for itself in reduced heating and cooling bills, the first season.
- If your home has radiators, boost efficiency by making reflectors to reflect heat away from the wall and into the room.
- Insulate your house. If you can't do it all at once, do what you can when you can.

## **Lighting**

- Add dimmers to switches on overhead lights. Soft light uses less electricity.
- Put low-watt bulbs in lamps not used for reading. If you need strong light, however, one 150-watt bulb is more efficient than two 75-watt bulbs.

- Replace incandescent light bulbs with fluorescent ones. Fluorescent uses less electricity and lasts 10 to 15 times longer.
- When leaving a room for more than half an hour, turn fluorescent lights off. When leaving for more than five minutes, turn incandescent lights off.
- Install light timers or motion detectors rather than leaving lights on all night.

## **Water heater**

- Match water heater size to the needs of the family.
- Insulate water heater with a manufacturer's insulation blanket made for that type of water heater.
- Perform water heater maintenance twice a year by draining sediment from the bottom of the tank. If you have an electric water heater, turn power off at the circuit breaker.
- Turn off water heater if house is empty for more than one day.
- Install a water heater timer that turns the heater off while you sleep and back on again in plenty of time to heat water for morning needs.
- Don't let hot water run continuously while shaving or washing dishes.
- Take showers; they generally take less hot water than baths.

## **Appliances**

- Don't leave the coffeepot warming for hours. Instead, transfer coffee to a thermos and turn the coffeemaker off.
- Cook topside whenever possible. The oven uses almost four times the energy as the stovetop burners.
- Select the “energy save” option on your dishwasher, and use the dishwasher only once daily, preferably at night before bed. Run only a full dishwasher.

- Wash all but the most soiled clothes in warm or cold water. This saves at least \$50 per year in utility costs.
- Use microwave whenever possible. A microwave uses 85 percent less electricity than cooking on a gas or electric range.
- Preheat oven only when necessary. Many foods can start out in a cold oven with no adverse effects.
- Make sure reflector pans beneath stove's burners are bright and clean. These help focus heat rays to the bottom of the cooking utensil.
- Turn refrigerator to a warmer setting when away from home for more than a day. As long as the door stays closed, the food should be fine.
- Whenever possible, use small appliances such as toaster oven, electric skillet, slow cooker, and so on. On the average, these use half the energy used by a full-sized oven.
- Vacuum the coils at the back and the bottom of refrigerators and freezers frequently to prevent dust build up. Dust makes the appliance run more often.
- Pull refrigerators and freezers away from the wall at least six inches to a foot. They need room to run efficiently.

## **Conclusion**

Although increased energy production may be the most effective way to offset consumer energy costs, that may or may not happen anytime soon. So, while we wait for our nation's energy executives and political leaders to come up with a definitive answer regarding the ever increasing energy costs, we consumers can do our part to help cut our families' energy cost by implementing family energy conservation plans.

**Lesson Plan 2: Global Warming**

**1. Compatible with Curriculum Map Unit:** 8.3- Influencing Others to Make Decisions that Matter to Us

**2. Environmental Theme: Global Warming (Time: 2-3 days)**

**3. Topic: Interpreting Informational Text (An Inconvenient Truth)**

**4. Big Picture:** The decisions we make impact us and those around us.

**5. Essential Question:** Is global warming a myth or reality?

**6. Reflection:** “Global warming is too serious for the world any longer to ignore its danger or split into opposing factions on it.” Tony Blair

**7. General Strategy:**

E.C.A Phase:       Exploration  Conceptualization  Application

Reading Trilogy      Phase:  Before       During       After

**8. Curriculum Connection:**  Spanish  Science  Technology

**9. Expectations:**

**L/S.8.1** Analyze the text, establish purpose, identify author’s purpose, and distinguish text features to enhance comprehension.

**R.8.5** Distinguish between fact and opinion in narrative and expository texts; states and paraphrases main idea or topic, and determines important details.

**W.8.2.** Classifies and applies the parts of speech, uses vocabulary, accurate spelling, appropriate grammar and syntax in writing.

**10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objective:** Throughout several activities the student will be able to:

**Conceptual:** As students watch the documentary “An Inconvenient Truth”, they will analyze the major points presented in support of the existence of global warming effectively.

**Procedural:** Using the documentary and other online informational texts as reference sources, students will complete a Venn diagram which underscores the main differences and similarities between the skeptics and supporters of global warming. In one of the extended activities on global warming, students will paragraph the main points of both the supporters and skeptics of global warming as they play the role of presidential advisors to the president on environmental matters.

**Attitudinal:** By watching the documentary and gaining insight into the effects of global warming, students will demonstrate interest in knowledge discovery by researching additional informational texts on the causes and effects of global warming.

**12. Assessment Techniques:** Graphic Organizer (Venn Diagram), Role playing

**13. Activities:**

**Initial:**

Day 1. Whole class discussion about the term- Global Warming in an attempt to determine prior knowledge and identify possible misconceptions.

Day 2. For bell work, students will write a one - paragraph reflection on the documentary.

**Development:**

Day 1. The class will watch the documentary “An Inconvenient Truth” and take note of salient points raised by the presenter- Al Gore.

Day 2. After watching the movie, the students will conduct a web quest in order to learn more about both sides of the global warming debate; they will complete a Venn Diagram which shows the key facts presented by people on either side of the global warming divide.

**Closing:**

Day 1. Students will give oral reaction to the documentary.

Day 2. Students will take turn reading their reflection aloud.

**14. Materials:** Graphic Organizer- Venn Diagram, Movie Documentary, Notebooks

**15. Extended Activities:**

**2a: Role Playing**

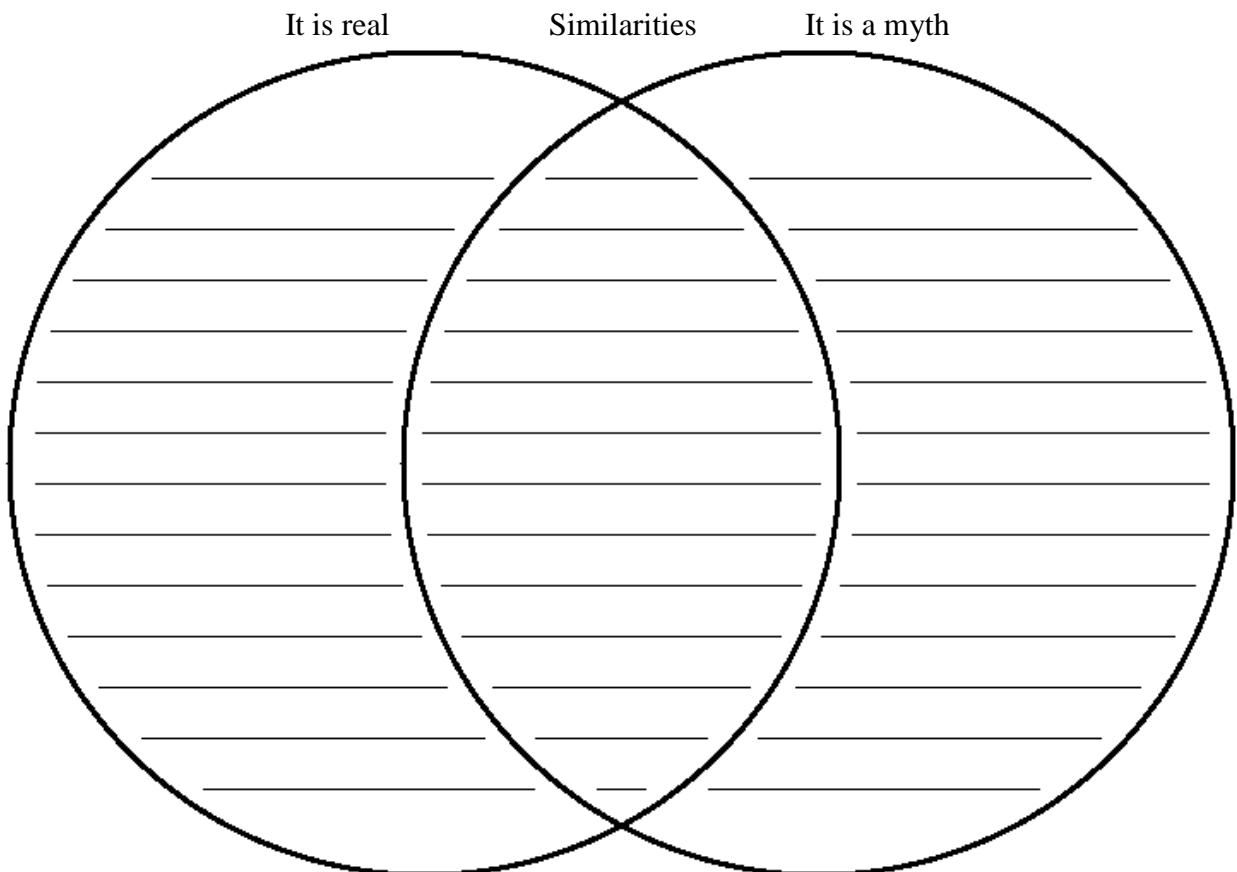
Students will conduct a web quest at the school library and come up with specific recommendation for the governor on how to reduce the social, economic and health outcomes of global warming. Students will role play advisors and special assistants to the governor of Puerto Rico on Global Warming.

## **2b: Venn Diagram- Key Facts Presented by People on both sides of the Global Warming Debate**

### **Debate**

Instruction: Mention the key facts presented by people on either side of the global warming debate.

Question: Is there such a thing as global warming, which is primarily caused by humans?



### ***Lesson Plan 3: Animal Rights***

**1. Compatible with Curriculum Map Unit:** 8.3- Influencing Others to Make Decisions that Matter to Us

**2. Environmental Theme:** Animal Rights (Duration: 2-3 days)

**3. Topic: Is Animal Testing Necessary?** Arguments For and Against Animal Testing

**4. Big Picture:** The decisions we make impact us and those around us.

**5. Essential Question:** Do you think animal testing is justified under certain situations?

**6. Reflection:** "The question is not, "Can they reason?" nor, "Can they talk?" but rather, "Can they suffer?" Jeremy Bentham

**7. General Strategy:**

E.C.A Phase:  Exploration     Conceptualization     Application

Reading Trilogy      Phase:  Before       During       After

**8. Curriculum Connection:**  Spanish       Science       Technology

**9. Expectations:**

**L/S.8.3** Uses appropriate language structure to interact in discussions and presentations, to problem solve, explain a process, and express opinions integrating comparison and contrast statements to interact in discussions and presentations.

**R.8.2** Applies context clues, reference sources, and other vocabulary expansion strategies to assess word meaning using prior knowledge to relate to new meaning; uses prefixes, suffixes, and root words to determine the meaning of unfamiliar, multiple-meaning, and compound words.

**10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objectives:** Throughout several activities the student will be able to:

**Conceptual:** After listening to a cosmetic manufacturer, as well as an Animal Rights Activist, speak to the class about the merits and demerits of animal testing, students will apply reference sources in preparation for the ‘Animal Rights Awareness Debate’.

**Procedural:** Having researched the pros and cons of animal testing at the computer lab, students will use appropriate language structure in staging an ‘Animal Rights Awareness Debate’ where arguments will be heard for and against animal testing.

**Attitudinal:** As a way of encouraging respect for the opinion of others, students will coordinate with their various group members to come up with balanced talking points about their positions with respect to animal testing.

**12. Assessment Techniques:** Debate presentation, Teacher observation, Scrapbooking, Mask-making

**13. Activities:**

**Initial:** Having listened to both sides of the debate on animal testing presented by guest speakers on an earlier date, students will orally respond to open-ended questions about what they learned from listening to the guest speakers- the animal rights activist and the cosmetics manufacturer. For instance, “did any of them change his/her mind about the legitimacy of animal testing after listening to the arguments presented by either presenter?”

**Development:**

Day 1. Class time will be spent in a computer lab as groups of student research articles for or against the use of animals for the production of new medicine, manufacturing of cosmetics and the development of surgical techniques.

Day 2. Students will organize in groups to stage a debate on animal testing. The event would be open to the entire school community in order to enlighten people on the issue of animal testing.

**Closing:**

Day 1. Students will use the guiding questions to ensure that they research all the crucial details in support of their position.

Day 2. Students will display their debating skills as they argument for and against animal testing in an open forum.

**14. Materials:** Library sources, Online reference sources, Periodicals, Crafts materials & Notebooks

**15. Extended Activities:**

**3a. Scrapbooking**

Create a scrapbook in which they include pictures, drawings, newspaper articles, observation notes, music lyrics about animals, haiku or other animal poems and clips related to the topic of animal testing.

**3b. Mask-Making for An ‘All Species School Parade’**

Students will be encouraged to select a broad range of Puerto Rican species, especially the endangered animals. This would give them a heightened sense of connection to the world of other species around them as they celebrate our connection to other species and the physical world around us. According to Grant & Littlejohn (2004), who recommend this method, “making masks, headdresses, and costumes to represent their chosen creature reinforces emotional ties and leads students to want to know more about their species.” (p. 146)

Also, have students conduct research on their chosen species and afterwards, create a poster with vital information about their species for display during the All Species School Parade. Students can be encouraged to work on short skits to be performed at intervals during the school-wide parade. Parents should be invited to be part of the fun activity.

### **Guiding Questions for students against animal testing**

1. Articulate the key reasons why animal testing should be prohibited.
2. Give reason why it is never justified to inflict pain on an animal.
3. Mention some alternatives to animal testing in scientific and medical research.
4. Why is it important for ordinary people to investigate whether their medication was tested on animals? Provide information about how people can verify whether their medication was tested on animals.

### **Guiding Questions for students in support of animal testing**

1. Explain the greater good that justifies the use of animals in any type of scientific research.
2. Present evidence to show that animal testing is essential to scientific and medical advancement.
3. Counter the argument about the pain experienced by animals used for research purposes.
4. Refute the argument for the exclusive use of alternatives in scientific research.

## ***Lesson Plan 4: Environmental Crisis***

- 1. Compatible with Curriculum Map Unit:** 8.5- Using Poetry to Express Myself
  - 2. Environmental Theme:** Environmental Crisis
  - 3. Topic:** Poetry- The Great Mother Wails by Darder (2008)
  - 4. Big Picture:** The decisions we make can impact us and those around us. (CM)
  - 5. Essential Questions:** In what ways have humans contributed to the environmental crisis?

Why do decisions matter? How is poetry created?

## **6. Reflection:**

“What we are doing to the forests of the world is but a mirror reflection of what we are doing to ourselves and to one another.” — Mahatma Gandhi

## **7. General Strategy:**

**E.C.A** Phase: x Exploration x Conceptualization x Application

## **Reading Trilogy**      Phase: x Before      x During      \_\_\_\_\_ After

**8. Curriculum Connection:**      x Spanish      x Science      x Technology

## **9. Expectations:**

**L/S.8.1** Listens and responds during a read aloud from a variety of fiction and nonfiction to comprehend, generalize, relate to character and setting, identify tone, voice, and mood; makes connections to text.

**L/S.8.4** Applies a variety of language patterns and structures to explain texts, discuss topics and themes, express thought on plot development, identify problem and solution, as well as make predictions, inferences, and draw conclusions from listening to a variety of texts and multimedia sources.

**R.8.6** Uses elements of poetry to identify and interpret genre, imagery, and symbolism.

**W.8.4.** Uses poetry elements and imagery to develop and write different styles of poems.

**10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objectives:**

**Conceptual:** As every member of the class takes turns reading the poem performatively, students will effectively identify the elements of poetry such as mood, imagery, symbolism, metaphor and personification in the poem- The Great Mother Wails by Darder effectively.

**Procedural:** After the read-aloud, students will apply a variety of language patterns and structures to explain the major themes addressed in the poem- The Great Mother Wails by Puerto Rican author, Antonia Darder.

**Attitudinal:** By writing a written response to the poem and creating a poem of their own, students will demonstrate individual responsibility for their learning.

**12. Assessment Techniques:** Reflection, game, concrete poem

**13. Activities:**

**Initial:** The class will begin with the bell work which consists of a 15 minutes pre-reading writing activity. Students will draw and then write a paragraph on their favorite place in nature. They could draw inspiration from the reflection of the day, which is written on the board.

**Development:** The teacher and students will take turns reading the poem The Great Mother Wails by Darder. At intervals, the teacher will require students to identify the various elements of poetry using context cues.

**Closing:** Students will openly discuss their response to the poem and suggest ways of curbing the devaluation of their environment. Students will be encouraged to make connections to the text.

**14. Materials:** Poem Handout, Projector, Worksheet, Notebooks

**15. Extended Activities:**

- 4a. Write an original poem about an environmental issue
- 4b. Write a persuasive letter to the school board demanding recyclable containers.
- 4c. Students work in groups to make classroom recyclable containers for paper, as well as aluminum cans and then write about the experience.
- 4d. Empty students' lunch waste on tarp in front of the class and project images of malnourished children on a screen as students walk into the classroom. Have them write a reaction paper or poem about how the scene made them feel as they walked into the classroom.
- 4e. Have students make connection to the text by identifying some of the environmental problems that the poem highlights.
- 4f. Create a crossword puzzle using environmental themes.

## **The Great Mother Wails** by Antonia Darder

The Earth extends her arms to us;  
Revealing through her nature the  
changing condition of our existence.

She bends and twists,  
Deflecting the swords of  
Our foolishness,  
Our arrogance,  
Our gluttony,  
Our deceit.

Unbridled by red alerts or amber warnings,  
Her ire gives rise to monsoon winds,  
Jarring us from the stupor of  
Our academic impunity;  
Our disjointed convolutions,  
Our empty promises; our  
black and white dreams.

Filled with unruly discontent,  
we yearn to dominate her mysteries;  
reducing her to microscopic dust,  
we spit upon her sacredness,  
tempting the fury of her seas.

We spill our unholy wars  
upon her belly's tender flesh,  
blazing dislocated corpses,  
ignite her agony and grief.

Still, in love with her creations,  
she warns of our complacency  
to cataclysmic devastation,  
rooted in the alienation of  
our disconnection  
our rejection,  
our oppression,  
our scorn.

And still, we spin ungodly  
tantrums of injustice  
against her love,  
against ourselves,  
against one another.

When will we remove blindfolds from our eyes?  
When will we stretch our arms—to her?  
When will the cruelty of our  
Hatred cease; teaching us to  
abandon the impositions of  
patriarchy and greed?

Oh! that we might together renew  
Our communion with the earth,  
She, the cradle of humanity;  
She, the nourishment of our seeds;  
She, the beauty of the song within;  
She, the wailing that precedes.

#### About Antonia Darder

Antonia Darder is a professor at the University of Illinois Urbana-Champaign. She is a longtime Puerto Rican activist-scholar involved in issues relating to education, language, immigrant workers, and women's rights.

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

**Conservation Word Scramble**

C	O	A	L	R	V	W	P	X	E	Q	N	M	Y	A
B	E	X	E	L	I	S	S	O	F	H	A	N	G	M
E	T	V	U	P	L	A	N	E	T	C	M	Q	R	E
L	V	I	J	H	U	F	B	E	H	E	H	P	E	G
E	J	Z	O	A	C	L	P	I	W	A	S	O	N	E
C	L	H	H	Y	O	C	N	C	Y	C	N	U	E	N
T	X	H	Q	R	Y	E	N	G	A	P	B	K	E	E
R	I	V	T	O	S	Z	A	J	R	E	W	O	P	R
I	T	E	L	W	K	S	O	U	R	C	E	S	Z	A
C	P	C	O	N	S	E	R	V	A	T	I	O	N	T
I	M	X	Y	T	J	E	J	E	I	L	G	Z	S	O
T	T	P	Y	E	Q	U	I	P	M	E	N	T	L	R
Y	R	R	L	G	G	H	Q	J	G	U	N	F	E	W
U	T	N	E	M	N	O	R	I	V	N	E	T	U	J
S	Q	M	O	A	O	M	L	B	P	Y	H	E	F	O

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COAL  
CONSERVATION  
ELECTRICITY  
ENERGY  
ENVIRONMENT  
EQUIPMENT  
FOSSIL  
FUELS  
GAS  
GENERATOR  
MACHINES  
PETROL  
PLANET  
POWER  
REUSE  
SOURCES

**Lesson Plan 5: Nature Writing**

**1. Compatible with Curriculum Map Unit:** 8.4- Decisions that Shaped My Beliefs / 8.5- Using Poetry to Express Myself

**2. Environmental Theme: Nature Writing / Outdoor Education**

**3. Topic: Experiencing Nature:** Nature through the eyes of romantic and transcendental writers

**4. Big Picture:** Creating Poetry from Everyday Experiences and the World Around.

**5. Essential Question:** What is the point of nature observation and writing?

**6. Reflection:** “The joy of looking and comprehending is nature's most beautiful gift.” Albert Einstein

**7. General Strategy:**

**E.C.A**                   Phase:  Exploration  Conceptualization  Application

**Reading Trilogy**       Phase:  Before            During            After

**8. Curriculum Connection:**        Spanish        Science        Technology

**9. Expectations:**

**L/S.8.1** Listens and responds during a read aloud from a variety of fiction and nonfiction to comprehend, generalize, relate to character and setting, identify tone, voice, and mood; makes connections to text.

**R.8.6** Uses elements of poetry to identify and interpret genre, imagery, and symbolism

**W.8.4** Uses poetry elements and imagery to develop and write different styles of poems.

**10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objectives:** Throughout several activities the student will be able to:

**Conceptual:** Through exposure to romantic poetry, students will identify simile, metaphor, personification and imagery in romantic poetry.

**Procedural:** During a class trip to one of the rich natural reserves in Puerto Rico, students will use elements of poetry to interpret and reflect on the natural beauty of the physical location.

**Attitudinal:** Having found inspiration in the middle of a natural site, students will appreciate the beauty and refreshing awe of nature.

**12. Assessment Techniques:** Original poem (Haiku), Eco Blog entries, Oral presentation

**13. Activities:**

**Initial:** The teacher will read an excerpt from Walden by Thoreau and engage the students in open discussion about the role of nature in inspiring poetry and meditative reflection. “Why do we reflect on nature?”

**Development:** Have students split up in groups of four or five while on the field trip to one of the many magnificent natural attractions in Puerto Rico; have them observe the nature around them in silence for five to ten minutes. Have them draw what they find most compelling and write a short poem (haiku) about the particular subject of their fascination.

**Closing:** The students will get back in a group and sit in a circle to share their poems/reflections.

**14. Materials:** Notebooks, Online

**15. Extended Activities:**

**5a. What (Who) Am I?**

Have students imitate some of the sounds or movements of life forms in the area they visited as the rest of the class guesses what they are.

## **5b. Eco Blog**

Create a class blog- students web exchange where students can post their musing about various subjects, one of which is their favorite place in nature. This could be a Facebook page since the students are more likely to visit Facebook than any other site. The following features should typify the blog:

- Feedback from other students
- Posting of a minimum of one original piece should be mandatory for all students
- There should be various categories under the subheading of: poetry, creative writing, narrative writing, etc.

<http://learning.blogs.nytimes.com/1999/02/09/does-mother-nature-know-best/>

***Lesson Plan 6: Literature and the Environment***

**1. Compatible with Curriculum Map Unit:** 8.2- Transformative Decisions through Memoir/ ‘Personal Stories’

**2. Environmental Theme:** Literature and the Environment/ Outdoor Education

**3. Topic:** Inspiring Environmental Agency through Literature

**4. Big Picture:** Transformative decisions that inspire right action.

**5. Essential Question:** Does Eco literacy (literature about environmental issues) play a role in inspiring environmental consciousness?

**6. Reflection:** “Socially and emotionally engaged Eco literacy, therefore, encourages us to gather and share information collectively, and to collectively take action to foster sustainable living.” Liza Bennett & Zenobia Barlow

**7. General Strategy:**

**E.C.A Phase:**  Exploration  Conceptualization  Application

**Reading Trilogy**      Phase:  Before       During       After

**8. Curriculum Connection:**  Spanish       Science       Technology

**9. Expectations:**

**L/S.8.1** Listens and responds during a read aloud from a variety of fiction and nonfiction to comprehend, generalize, relate to character and setting, identify tone, voice, and mood; makes connections to text.

**R.8.1** Analyzed the text, establishes purpose, identifies author’s purpose, and distinguishes text features to enhance comprehension.

**W.8.2** Classifies and applies the parts of speech; uses vocabulary, accurate spelling, appropriate grammar and syntax in writing.

**10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objectives:** Throughout several activities the student will be able to:

**Conceptual:** In an effort to stimulate critical thinking in students and inspire ecoliteracy, students will orally discuss the reflection for the day.

**Procedural:** After reading the true story of Omar Freilla titled “Turning Waste into Good Business and Good Jobs”, students will analyze the text in order to establish purpose as they answer the reading comprehension questions.

**Attitudinal:** By reflecting on Omar’s resolve to make an environmental difference, students will value the art of taking action to impact the environment in a decisive way.

**12. Assessment Techniques:** Making a Difference Project, Written answers to comprehension questions, Timeline

**13. Activities:**

**Initial:** Students will orally discuss the day’s reflection and consider ways the average Puerto Rican youth can impact the environment positively.

**Development:** Students will take turns reading the story- “Turning Waste into Good Business and Good Jobs” from the book *Heroes of the Environment: True stories of people who are helping to protect our planet* by Harriet Rohmer.

**Closing:** Students will recall details from the story as they write the answers to the comprehension questions.

**14. Materials:** Short story handout, Notebooks, Projector

## **Reading Comprehension for Lesson Plan 6**

Turning Waste into Good Business and Good Jobs by Omar Freilla

“If you have a use for something, it’s no longer waste.”

“Our first duty is to the place that raised us,” Omar Freilla says. “For me, it’s the South Bronx.”

The South Bronx is known as the birthplace of hip-hop – the music, dance, and art movement that swept the world and made fortunes. It is also one of the poorest and most polluted places in the nation, with smog-choked freeways and smelly wastewater treatment plants. Day and night, huge trucks deliver construction waste to transfer stations, places where stuff that nobody wants is sorted, transferred to other trucks, and then taken away to distant landfills.

“We’re a dumping ground,” Omar explains. “All the garbage from the rest of New York City ends up here.”

But like the founders of hip-hop, who thought of new ways to use old music, Omar started looking at garbage in a different way. “A lot of what people throw away is perfectly good,” he says. “Building supplies are a great example. Just look at that stuff from construction sites in New York City – doors, sinks, toilets. People will buy those things. It’s only called garbage because somebody threw it away.”

Omar was just out of college and working for an environmental group called Sustainable South Bronx when he started thinking about how he could get this “good garbage” to people who could use it. Instead of destroying things like old windows and doors, why not clean them up and resell them? Why not hire people who live in the community to do the work? Better yet, why not make this business a “cooperative”, which means that the people who work in the business own it and share the profits?

Out of this combination of practical thinking and determination to do something for the South Bronx, Omar started the first cooperative in the country dedicated to reusing construction waste.

To start his business, Omar put up flyers along the truck-jammed, trash-filled streets of his neighborhood, looking for people to work with him. “Fire Your Boss!” the flyers said, his way of letting other ambitious young people know that he was offering them a chance to work in a business they would also run, instead of working for someone else. He soon found four other dedicated workers. They rented a warehouse and started looking for donations of used materials.

They called up hardware stores, building supply distributors, and contractors, offering to haul things away from construction sites for free. Their warehouse began to fill up. A hardware store gave 2,000 gallons of paint that was still good but was being thrown away because it was past its expiration date. A distributor donated 80 new toilets from a project that had been canceled. Contractors added unwanted doors, sinks, ceiling fans – even theater seats and a giant popcorn machine!

At the beginning, not everyone understood what Omar was doing. Even his mother, who raised him to get a good education and a good job, was alarmed when he told her about his idea for the cooperative. “She said, ‘OK, show me what you are doing.’ I told her we were reusing waste.”

“‘You’re collecting garbage?’ she said. ‘I sacrificed so you could go to school to learn to pick up trash?’”

He laughs at the thought. “She came around eventually,” he says.

In April 2008, Omar’s cooperative, which he named ReBuilders Source, opened its doors for business and began selling construction supplies – at reasonable prices – to neighborhood

builders and home-training program to help local residents learn the skills they need to get good jobs that help the environment and even start cooperatives of their own.

Omar envisions a future with a whole network of green worker co-ops in the South Bronx – cooperative businesses that will work together to reuse different kinds of construction materials. A major part will be creating businesses that deconstruct buildings instead of demolishing them. Workers will be trained to carefully take buildings apart so that things like doors, windows, and floors can be reused instead of being smashed to bits and sent off to a landfill. Deconstructing buildings this way could be a huge industry with many good jobs for people who need them.

“Think about a wooden door that you buy new. In order to produce that, someone had to cut down trees. In order to ship it across the country, someone had to pump oil out of the ground. You can avoid all that if you buy a perfectly good door that’s used. And at the same time, you can reduce pollution, save money, and create jobs in communities like the South Bronx.”

“If you have a use for something,” Omar says, “it’s no longer waste.”

**Reading Comprehension Questions:** “Turning Waste into Good Business And Good Jobs” by Omar Freilla

1. What is considered “good garbage”?
2. How did Omar start his business?
3. Explain the statement, “Fire your Boss!”
4. What is Omar trying to do? Recycle, Reuse, or Reduce? Explain.
5. What did Omar name his cooperative and when did he do this?
6. Mention three ways a typical teenager can help reduce pollution in Puerto Rico.

**Homework:** Sequence of Events

Create a timeline that shows the development of Omar’s business.

**Sequence of Events:** Create a timeline that shows the development of Omar's business.



**15. Extended Activities:****6a. Making A Difference Project: Engaging in an environmentally-friendly effort (100 points)****Suggestions:**

- Picking up trash from a beach
- Picking aluminum cans at a park or party for recycling purposes
- Compost generation at home
- Taking clothes your family does not need to the Salvation Army

Include a picture of yourself engaging in the activity.

Write three paragraphs (3) about the experience and how it may have changed your perspective on pollution or recycling.

Discuss the importance of the project (pollution, recycling, compost generation, etc.) and what the experience was like for you.

Feel free to invite family members to join you in improving our environment.

## MAKING A DIFFERENCE PROJECT: WRITING GUIDELINES

### 1<sup>ST</sup> PARAGRAPH- THE INTRODUCTION

- Hook
- Give background information about the topic (quote at least one **reliable** source & include the reference at the end)
- Thesis or focus statement- specify the topic of your paper

### 2<sup>ND</sup> PARAGRAPH- BODY

- Discuss the **process** with dense descriptions- what did you do? Why did you select that particular activity for this project? Who went with you? Did you encounter any obstacles?

### 3<sup>RD</sup> PARAGRAPH- CONCLUSION

- Summary of your main point
- Was it an educational activity? If so, what exactly did you learn from the hands-on activity?
- Did you enjoy the process?
- Your reflection on the activity

## ***Lesson Plan 7: Advertising & Waste Reduction***

**1. Compatible with Curriculum Map Unit:** 8.4- Decisions that Shaped My Beliefs / 8.5- Using Poetry to Express Myself

**2. Environmental Theme:** Advertising & Waste Reduction

**3. Topic:** Media Critique: The Negative Consequences of Exaggerated Advertisement

**4. Big Picture:** The Role of the Media in Creating an Enabling Environment for Pro-Environmental Stewardship.

**5. Essential Question:** Is It Ethical to Use Issues That Play On Teen's Vulnerabilities And Insecurities In Adverts?

### **6. Reflection:**

"Advertisers constantly invent cures to which there is no disease." - Author Unknown

### **7. General Strategy:**

**E.C.A**      Phase:  Exploration       Conceptualization     Application

**Reading Trilogy**      Phase:  Before       During       After

**8. Curriculum Connection:**  Spanish       Science       Technology

### **9. Expectations:**

**L/S.8.1** Listens and responds during a read aloud from a variety of fiction and nonfiction to comprehend, generalize, relate to character and setting, identify tone, voice, and mood; makes connections to text.

**W.8.1** Combines sentences and ideas using simple transitional phrases; applies commas and colons to correctly punctuate sentences, identifies phrases and clauses; applies phrases in writing to construct complex sentences.

**10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objectives:** Throughout several activities the student will be able to:

**Conceptual:**

Day 1. By viewing the video clip “The Story of Stuff”, students will be able to critically examine newspaper ads targeted at teenagers and determine the intended purpose.

Day 2. Having viewed several newspaper adverts aimed at teenagers, students will be able to identify inconsistencies, bias, exaggerated claims and stereotypes associated with teenage advertising.

**Procedural:**

Day 1. Following the viewing of the video clip “The story of Stuff”, student will work in groups to determine the advertising strategies of the marketers.

Day 2. Having foreknowledge of advertising strategies, students will take turns reading the news article titled “Advertising to Teens” by Susan Carney and answer the questions that follow.

**Attitudinal:** By recognizing the hidden message in advertising targeted at teens, students will be equipped with the knowledge to make balanced choices and not be deceived by dubious ads.

**12. Assessment Techniques:** Creation of Spoof Ad, Reading Comprehension questions

**13. Activities:**

**Initial:**

Day 1. Have students watch the “The Story of Stuff” (20 min.)

[www.TheStoryofStuff.com](http://www.TheStoryofStuff.com)

Day 2. Open discussion where students are asked to discuss what brings them the most happiness in life. Most would likely refer to substantive things such as friends and family. However, if there are students who mention ‘stuff’, ask what would happen to them if the particular item did not exist or it is permanently banned from circulation.

**Development:**

Day 1. Students will work in groups to critically examine the newspaper/ online adverts they brought to class which target teenagers and their ‘needs’.

Day 2. As students take turns reading the article, the class will pause at various intervals in order to discuss the implications of teenagers’ unchecked responses to television, internet, and newspaper adverts targeted at them.

**Closing:**

Day 1. Students will note in their notebooks the specific strategies used by the marketers in their teen-targeted advertising.

Day 2. Students will work in pairs to answer the questions that would further evoke critical and reflective thinking in the students.

**14. Materials:** Video Clip, Newspaper ads, Periodicals, Notebooks

**15. Extended Activities:**

**7a. Spoof Advertising**

In the activity, students will use the advertising strategies used by the marketers to create spoof adverts for the various teen-targeted newspaper advertisement they brought to class.

The spoof ads will satirize the unbalanced message of the advertisements by noting the health hazards, environmental hazards, or feelings of inadequacy that could be direct consequences of frivolous advertisements targeted at teenagers.

The aim is to make a mockery of the marketers' hidden agendas, as well as sensitize students about the loopholes in the slogans and enticing offers presented to them in most adverts.

## ***Lesson Plan 8: Advertising and the Environment***

- 1. Compatible with Curriculum Map Unit:** 8.4- Decisions that Shaped My Beliefs
- 2. Environmental Theme:** Advertising and the Environment
- 3. Topic: Reading Comprehension-** “Advertising to Teens” by Susan Carney
- 4. Big Picture:** Negative Consequences of Exaggerated Advertising Directed at Under aged Children
- 5. Essential Question:** Do you think companies should be allowed to advertise any product targeted at under-aged children?

What role does advertising play in children's lives?

### **6. Reflection:**

“The joy of looking and comprehending is nature's most beautiful gift.” Albert Einstein  
“Socially and emotionally engaged ecoliteracy, therefore, encourages us to gather and share information collectively, and to collectively take action to foster sustainable living.” Liza Bennett & Zenobia Barlow

### **7. General Strategy:**

<b>E.C.A</b>	Phase: <input checked="" type="checkbox"/> Exploration	<input checked="" type="checkbox"/> Conceptualization	<input checked="" type="checkbox"/> Application
<b>Reading Trilogy</b>	Phase: <input checked="" type="checkbox"/> Before	<input checked="" type="checkbox"/> During	<input type="checkbox"/> After

### **8. Curriculum Connection:**

<input checked="" type="checkbox"/> Spanish	<input checked="" type="checkbox"/> Science	<input checked="" type="checkbox"/> Technology
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### **9. Expectations:**

**L/S.8.1** Listens and responds during a read aloud from a variety of fiction and nonfiction to comprehend, generalize, relate to character and setting, identify tone, voice, and mood; makes connections to text.

**R.8.6** Uses elements of poetry to identify and interpret genre, imagery, and symbolism

**W.8.4** Uses poetry elements and imagery to develop and write different styles of poems.

**10. Depth of Knowledge:** Strategic Thinking (IV)

**11. Operational Objectives:** Throughout several activities the student will be able to:

**Conceptual:** After critically examining newspaper advertisements targeted at teens, students will be able to identify inconsistencies, biases, and exaggeration of facts associated with teen advertising.

**Procedural:** Following the read-aloud of the news article “Advertising to Teens” by Susan Carney, students will proceed to answer questions on the passage which requires critical thinking skills.

**Attitudinal:** By recognizing the hidden message in advertising targeted at teens, the students will be equipped with the knowledge to make balanced spending choices and not be easily deceived by dubious teen-targeted ads.

**12. Assessment Techniques:** Comprehension questions, Teacher Observation

**13. Activities:**

**Initial:** Begin discussion on teen advertising by asking students what brings them the most happiness in life. If there are students who say “stuff”, ask them what would become of them if the stuff did not exist or if it is banned from circulation?

**Development:**

As students take turns reading the article, the class will pause at various intervals in order to discuss the implications of unchecked responses to television, internet, and radio ads targeted at teens.

**Closing:**

Students will pair up to answer the comprehension questions which will further evoke critical and reflective thinking in them.

**14. Materials:** Article handouts, Library sources, Online reference sources, Periodicals, Notebooks

## **Reading Comprehension:** “Advertising to Teens” by Susan Carney

Kids and teens are a valuable market to advertisers. Helping them become more critical of marketing messages can help protect them from exploitation. Why do marketers love teens? A number of reasons. They have money to burn, and the items they buy are largely “luxury” items, like clothing, electronics, and music. They make many, if not most, of their purchasing decisions independently. And they have significant influence on family purchases. Perhaps most importantly, companies know that once they have “branded” a child, he or she is likely to be a customer for life, or from “cradle to grave.” How do they reach kids? Everywhere. Advertising is in magazines, movies, TV shows, and on the internet. Licensed products, in the form of clothing, toys, and accessories abound. Schools make deals with soda companies and sell naming rights to their gyms to the highest bidder. Companies glean important demographic info about kids spending habits from seemingly innocuous internet “quizzes” and “surveys”. Marketing comes at kids from all directions, twenty-four seven.

How do marketers do it? They know how to capitalize on important teenage issues and anxieties, like body image, peer acceptance, coolness, and a need for power. They use these themes repeatedly in advertising geared towards children and teenagers. Marketers also often hone in on themes and attitudes that parents might find inappropriate or offensive, like sex or alcohol and drug use, further escalating the “coolness factor” of the product.

Why is advertising so effective? Advertising works best when it creates insecurity about something, such as appearance. A successful ad convinces the viewer that they have a problem that needs fixing, and then proposes to offer the solution, which just happens to be the product they are selling. The message is that teens aren’t good enough the way

they are. Many kids unwittingly buy into that message, and as a result, end up being hypercritical of themselves because we don't fit a certain "image" that they believe is necessary for their happiness.

**Reading Comprehension Questions:** “Advertising to Teens” by Susan Carney

1). Mention three reasons why marketers target teens?

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

2). How often do marketers flood mass communication outlets visited by teens with adverts directed at them?

- a. three times a week
- b. only during evening news
- c. all the time
- d. during holidays
- e. during sports programs

3). Mention at least three important teenage issues or anxieties that marketers exploit?

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

4). Why is teenage-targeted advertising very effective?

- a. very smart people create the adverts
- b. it is an important for human survival
- c. it creates insecurity about something
- d. it does not misrepresent the truth

5). What are the consequences of buying into the message sold by the marketers?

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## ***Lesson Plan 9: Recycling I***

- 1. Compatible with Curriculum Map Unit:** 8.6- Making Healthy Choices
  - 2. Environmental Theme:** Recycling
  - 3. Topic:** Expository Text (**Reading Comprehension as a pre-writing strategy-** “The 3Rs”)

(Modified from Andrew J. Holownych's version to give it local context)

- 4. Big Picture:** The decisions we make impact us and those around us.

Characters' decisions advance the plot (CM)

- ### **5. Essential Question: "Why should we recycle?"**

## **6. Reflection:**

“You can tell how high a society is by how much of its garbage is recycled.” Dhyani Ywahoo

## **7. General Strategy:**

E.C.A Phase: x Exploration x Conceptualization x Application

**Reading Trilogy**      Phase: x Before      x During      x After

- 8. Curriculum Connection:** x Spanish      x Science      x Technology    x Agricultural Science

## 9. Expectations

**L/S.8.1** Listens and responds during a read aloud from a variety of fiction and nonfiction to comprehend, generalize, relate to character and setting, identify tone, voice, and mood; makes connections to text.

**R.8.5** Distinguish between fact and opinion in narrative and expository texts; states and paraphrases main idea or topic, and determines important details.

**W.8.2.** Classifies and applies the parts of speech, uses vocabulary, accurate spelling, appropriate grammar and syntax in writing.

- #### **10. Depth of Knowledge: Extended Thinking (III)**

**11. Operational Objective:** Throughout several activities the student will be able to:

**Conceptual:** While reading the expository text titled “The 3Rs” by Andrew J. Holownych, students will make connections to the text by reflection on their recycling habits.

**Procedural:** Having listened to the teacher’s explanation of the basic tenets of expository writing, students will determine important details from the text by responding to the comprehension questions on “The 3Rs”.

**Attitudinal:** To demonstrate that they comprehend the benefits of recycling, students will select a classmate’s name from a bag and design a gift for the person from recycled items.

**12. Assessment Techniques:** reflective, Journal Keeping, oral report, paintings or drawings

**13. Activities:**

**Initial:** The class will begin with students orally discussing the question, “How can we reduce waste in our homes?” This will go on for ten minutes. They could draw inspiration from the reflection of the day, which is written on the broad.

**Development:** Students will volunteer to read sections of the expository writing titled, “The 3Rs”. At intervals, the teacher will require students to make connections to their personal lives or the Puerto Rican environment.

**Closing:** Students will answer the comprehension questions and study the vocabulary words.

**14. Materials:** Graphic Organizer, Projector, Worksheet, Notebooks, Story: The 3Rs (Modified from Andrew J. Holownych’s version to give it local context)

**Reading Comprehension Passage:** “The 3Rs” (Modified from Andrew J. Holownych’s version to give it local context)

The problem of trash is getting worse, as more countries join the throwaway world. So, what can we do to change our throwaway world? Maybe you’ve heard of the 3Rs. They mean **Reduce, Reuse and Recycle**. These three are the most important ways to make less garbage, save natural resources, and cause less pollution.

The first of the 3Rs is Reduce, which means to decrease the amount of trash we make. Reducing is the most efficient way to **conserve** resources and energy. One way to reduce waste is to think about what you want and what you need. Do you really need another pencil or pen, or do you just want one? Buying things with less packaging, borrowing or sharing when possible and using both sides of the paper are other choices you can make. If something is broken, instead of throwing it out, you can repair it. Shopping for **durable** products, and taking care of your things so they last, are also two great ways to reduce the trash you make.

The next 2Rs are an **alternative** to disposal in **landfills** or **incinerators**, and keep our waste in a cycle. Reusing is the second most efficient way to conserve resources and make less waste. This is because materials don’t have to be collected, and no energy is needed to make a new product. Glass bottles are one of the easiest things to reuse. All you have to do is wash them out, dry them, and they can be used again and again! Instead of using **disposable** items, we can carry our own chopsticks, and drink containers. Sometimes one person’s garbage is another person’s **treasure**. Second-hand stores sell used items which are much cheaper. There are even websites where you can sell or give things away for free ([www.freecycle.org](http://www.freecycle.org))!

The last R is Recycling, and it involves using old products to make new products. Many everyday objects, such as paper, glass, aluminum cans, and plastic bottles can be recycled. Even though recycling saves natural resources and energy, it still causes **pollution** from transportation

and **production**. To encourage people to recycle, some governments even offer money to return recyclable material. In Puerto Rico some people make their living collecting recyclable material, and trading it in for money. Have you seen these people in your community? Additionally, for recycling to be successful we need to purchase products made of recycled material.

By using all of the three Rs, not just one or two, is a big challenge. But together with your friends, family, teachers and classmates, everyone can work together to make less waste, save our natural resources, and keep Puerto Rico beautiful.

**Comprehension Questions:** “The 3Rs” (Time: 15-20 minutes)

1. Why are the 3Rs important? (to make less garbage, save natural resources, and cause less pollution)
2. What is the advantage of Reduce over Recycle and Reuse? (reduce means you do not buy something and so you conserve resources and energy)
3. Mention three ways you can reduce? (Buy stuff with less packaging, borrow or share, fix broken items and buy durable products)
4. Why is Recycling the less efficient way of conserving resources? (still need to use some energy, causes pollution)
5. Which of the 3Rs do you currently do? If none, which do you think you can begin to do? (answers will vary)

**Additional Readings:** The Waste-to-Energy Solution in Caribbeanbusiness.pr

June 28, 2012; 12 edition; vol: 40/ No: 25

<http://www.energyanswers.com/pdf/The%20WTE%20Solution.28june2012.pdf>

**Vocabulary Acquisition:** Time: 15-20 minutes

- 1) Reduce- to bring down to a smaller size
- 2) Reuse- to use more than once
- 3) Recycle- convert (waste) into reusable material
- 4) Conserve- To protect from loss or harm
- 5) Durable- Capable of withstanding wear and tear or decay
- 6) Alternative- a possible or remaining choice
- 7) Landfill- A method of solid waste disposal in which refuse is buried between layers of dirt so as to fill in or reclaim low-lying ground.
- 8) Incinerator- a furnace or apparatus for disposing something, especially refuse
- 9) Disposable- designed for or capable of being thrown away after being used
- 10) Treasure- One considered especially precious or valuable
- 11) Pollution- the introduction of harmful substances or products into the environment
- 12) Production- the act of creating or making; (v.) produce

## ***Lesson Plan 10: Recycling II***

**1. Compatible with Curriculum Map Unit:** 8.3- Influencing Others to Make Decision that Matter to Us

## **2. Environmental Theme: Recycling 2 (Duration: 3-5 days)**

**3. Topic:** Persuasive Writing / Read Comprehension as a pre-writing strategy- “The Waste-to-Energy Solution”

**4. Essential Question:** “What makes an argument compelling? (CM 8.3)

**5. Big Picture:** The decisions we make impact us and those around us.

Characters' decisions advance the plot (CM)

## **6. Reflection:**

"We live in a disposable society. It's easier to throw things out than to fix them." Neil LaBute

## **7. General Strategy:**

**E.C.A** Phase: x Exploration x Conceptualization x Application

**Reading Trilogy**      Phase: x Before      x During      x After

**8. Curriculum Connection:** x Spanish      x Science      x Technology

## **9. Expectations:**

**L/S.8.3** Uses appropriate language structure to interact in discussions and presentations, to problem solve, explain a process, and express opinions integrating comparison and contrast statements to interact in discussions and presentations.

**R.8.4** Sorts and organizes relevant events, states cause and effect, makes connections, predictions, and inferences, determines problem and solution, and draws conclusions in narrative, expository, and persuasive texts.

**W.8.3** Applies organizational patterns and the elements of descriptive, narrative, and expository forms to construct a three-paragraph composition.

W.8.5 Uses basic editing marks and reference sources to revise writing; verifies information; writes a final draft using the writing process.

**10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objectives:**

**Conceptual:**

1. By carefully reading the expository writing titled “The Waste-to-Energy Solution”, students will determine the problem and solutions to the landfill crisis in Puerto Rico.
2. Following the teacher’s instructions on how to design a ‘Household Recycling Survey’, the students will draw conclusions about the peculiar needs of their individual families and try to problem solve their recycling challenges.

**Procedural:**

1. Having listened to the teacher’s explanation of the basic tenets of persuasive writing (see CM 8.3 persuasive writing resources), the students will apply appropriate grammar and syntax in writing a persuasive letter to the school council, the mayor’s office and different relevant agencies asking for recycling bins for the school.

2. Following guidelines for the ‘Household Recycling Survey’, students will work in groups to design and present the findings of their survey before the entire class.

**Attitudinal:**

1. By writing persuasive letters asking for recycling bins for the school, the students will be making a marked difference in the school community.

2. By participating in the ‘Household Recycling Survey’, students will work cooperatively as a team to draw conclusions about the dominant habits and behavior of their family members with regards to recycling.

**12. Assessment Techniques:** Persuasive Essay & Household Recycling Survey

**13. Activities:**

**Initial:**

Day 1. Students will orally discuss the reflection for the day. Class will begin with open-ended discussions on the importance of determining household recycling habits in order to make appropriate changes where necessary.

Day 2. Discussion on the value of needs analysis in order to identify the specific areas that need to be strengthened in their various families.

**Development:**

Day 1. Students will take turns reading the expository text aloud. Based on the need to reduce landfill waste, students will write the first draft of their letters to the school council, Mayor of Mayaguez, and other relevant agencies asking for recycling bins for the school.

Day 2-5. Students will edit one another’s draft and write the final draft of their persuasive letters. Students will work in groups to brainstorm appropriate questions for the household recycling survey in order to determine and analyze the recycling habits of members of their families. A minimum of six questions per student will be required.

They will combine their questions and subsequently produce a final draft of the survey. Students will incorporate mathematical skills in deciphering the tables and charts on household recycling habits. Students will present the findings of their household recycling survey before the entire class.

**Closing:** Students will share their opinion on the effectiveness of the process of writing to relevant bodies asking for recycling bins for the school and designing the ‘Household Recycling Survey’.

**Sample Questions for the Household Recycling Survey (Environmental Education for Kids)**

- 1) If you take more food than you can eat, do you throw the leftovers in the trash?
- 2) Do you use paper cups and plates for cookouts or picnics?
- 3) Do you bring lunch to school in a paper or plastic bag and throw the bag away every day?
- 4) Do you throw away aluminum cans or plastic bottles?
- 5) Do you use just one side of your writing paper?
- 6) If you make a mistake when writing or drawing, do you throw away your piece of paper and get a new one?
- 7) Do you throw away clothes you've outgrown?
- 8) When you see papers on the floor or ground do you leave them there?
- 9) Do you buy lots of books and magazines instead of using the library?
- 10) Do you ask for or take a bag when buying small things like candy or gum?
- 11) Do you buy juice or chips in single serving packages?
- 12) Do you use paper towels for drying your hands or cleaning up spills?
- 13) Do you leave the light on in your room when you're not there?
- 14) Do you use a clean sheet of paper to make paper airplanes?
- 15) Do you throw away broken crayons?

**14. Materials:** Handout “The Waste-to-Energy Solution”, Projector, Survey Worksheet, Notebooks

## **15. Activities:**

### **10a: Reading Comprehension Passage: The Waste-to-Energy Solution**

(CaribbeanBusinessPR.com: June 28, 2012 | Volume: 40 | No: 25)

The time to get serious about Puerto Rico's solid waste is here, and it came with the sobering impact of an uppercut straight to the jaw. New federal regulations issued last fall have Puerto Rico facing a scenario in which most of the island's landfills could be closed by October 2014.

The environmental threats generated by poorly operated landfills, which forced the federal Environmental Protection Agency (EPA) to lay down the law, have put pressure on the local authorities to figure out how to dispose of trash as we lead up to 2014 and beyond. Truth be told, Puerto Rico must look past the current regulatory flurry to take advantage of tremendous economic development opportunities that exist in fixing Puerto Rico's dysfunctional waste management apparatus.

It will take a precise mix of waste-to-energy (WTE) plants combined with recycling operations. All told, the garbage crisis could spark a \$2.5 billion investment in solid-waste infrastructure over the next 20 years and should double the size of Puerto Rico's recycling market.

An enormous step in the right direction was the recent preliminary endorsement by the EPA of the \$500 million Energy Answers Company's WTE plant in Arecibo. In the works for nearly three decades, the project is expected to create 3,800 jobs in its development phase and 150 jobs after start-up.

The seven months it took for the project to obtain preliminary approval by the EPA opened the door for Gov. Luis Fortuño to accuse EPA Administrator Judith Enck of dragging her

heels. Enck's critics see the slow pace of approval as an action underpinned by significant differences in waste-management philosophy. The EPA under the administration of President Barack Obama is officially against WTE as a cornerstone of waste management, after touting it as the answer in the days of former President George W. Bush.

In Enck's view, the answer is in recycling. She believes Puerto Rico must strive to achieve recycling levels closer to the 35% benchmark that was to have been reached in 2006. The EPA administrator must come to grips with reality: Puerto Rico's official recycling rate remains at the 11.31% it registered in 2008 and the target date to hit 35% has been moved back to 2016.

To its credit, the local Solid Waste Management Authority (SWMA) has been pushing municipalities to implement recycling through a \$7 million incentives program. The government agency also has an \$8 million annual fund destined to help landfills achieve compliance with the new EPA regs. The key here is to have a comprehensive strategy that works within the framework of Puerto Rico's realities, and that means not establishing a false choice between WTE and recycling, which is what some observers claim the EPA is doing.

Perhaps Environmental Quality Board President Pedro Nieves Miranda put it best when he said: "Puerto Rico is still 35 miles by 100 miles; it isn't growing. This waste-to-energy plant is part of the solution to handling our solid-waste problem, along with increased waste reduction and recycling."

Proponents such as the EQB president point to 400 WTE plants operating across densely populated Europe and 78 operating in the mainland U.S., with more under construction as evidence the technology is a perfect fit for Puerto Rico's limited space.

Undoubtedly, Puerto Rico must pursue the higher recycling levels that experts have set, but not at the expense of very important WTE projects, which, incidentally, separate material for recycling. This is no time for false choices tracing to environmental philosophies. The time for talking trash is over.

### **Reading Comprehension Questions: The Waste-To-Energy Solution**

1). Mention two solutions to the landfill crisis in Puerto Rico suggested in the reading?

a. \_\_\_\_\_

b. \_\_\_\_\_

2). What enormous step was recently taken by the EPA to resolve the waste disposal crisis in Puerto Rico?

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3). Only \_\_\_\_\_ % of Puerto Rico's waste is recycled annually.

4). What would be the consequence of not recycling more of Puerto Rico's waste in the near future? Give reasons from the reading for your answer.

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5). In your opinion, what can be done to encourage young people in Puerto Rico to recycle more often?

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## ***Lesson Plan 11: Exploring Solar Energy***

**1. Compatible with Curriculum Map Unit:** 8.6- Making Healthy Choices

**2. Environmental Theme:** Exploring Solar Energy

**3. Topic: Reading Comprehension-** Bringing Solar Power to Indian Country “With solar energy, we can be independent.” By Debby Tewa

**4. Big Picture:** How the Decisions we make could impact lives forever

**5. Essential Question:** Can we consume in a manner that does not jeopardize/degrade our environment?

**6. Reflection:**

"Solar energy is a clean alternative energy source. It's clear, given the current energy crisis, that we need to embrace new sources of renewable energy that are good for our planet." Yang Yang  
"It's time for the human race to enter the solar system." Dan Quayle

**7. General Strategy:**

**E.C.A**                   Phase:  Exploration  Conceptualization  Application

**Reading Trilogy**       Phase:  Before            During            After

**8. Curriculum Connection:**        Spanish        Science        Technology

**9. Expectations:**

**L/S.8.1** Listens and responds during a read aloud from a variety of fiction and nonfiction to comprehend, generalize, relate to character and setting, identify tone, voice, and mood; makes connections to text.

**R.8.1** Analyzed the text, establishes purpose, identifies author's purpose, and distinguishes text features to enhance comprehension.

**W.8.5** Uses basic editing marks and reference sources to revise writing; verifies information; writes a final draft using the writing process.

**10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objectives:** Throughout several activities the student will be able to:

**Conceptual:**

Day 1. As a pre-reading activity, the students will watch a video clip titled, ‘Carrying Power – Solar Power On the Go’. By considering the practical uses of solar power, students will establish the purpose and importance of solar energy.

Day 2. As students read a true life story of Debby Tewa, they will

**Procedural:**

Day 1. Having watched the video clip, students will orally identify other possible uses of solar energy in our daily lives.

Day 2. After reading the memoir- “Bringing Solar Power to Indian Country” by Debby Tewa, students will analyze the story as they answer the comprehension questions.

**Attitudinal:** With examining the impact of solar power on the lives of regular people, students will have a broader appreciation of the importance of renewable energy.

By volunteering to read the story aloud, students will overcome their fear of speaking English openly.

**12. Assessment Techniques:** Persuasive writing, Oral discussion, Teacher Observation

**13. Activities:**

**Initial:**

Day 1. Students will watch the video clip- Carrying Power – Solar Power On the Go. The Story of Stuff.

Day 2. Students will read the memoir- “Bringing Solar Power to Indian Country” by Debby Tewa

**Development:**

Day 1. Students will openly discuss a variety of solar-powered items in today’s world that could positively impact the way we live our lives.

Day 2. Students will answer the reading comprehension questions.

**Closing:**

Day 1. The students will summarize the main point of the video clip.

Day 2. Students will display their critical thinking skills by making predictions during the read aloud using content cues.

**14. Materials:** Video clip, Notebooks, Short story handout

**15. Extended Activities:**

**11a. Media Studies**

Write a five-paragraph letter to the editor of the San Juan Star making a case for why the general public should adopt solar energy.

Make recommendations in a five-paragraph letter to the editor proposing ways in which the media could positively impact the popularity of solar energy.

**11b. Field Trip to AES Solar Park, Guayama, Puerto Rico**

Take students on a field trip to the AES solar park in Guayama. Prior to the trip, students will be encouraged to write down questions for the tour guide who will be interacting with the students in both English and Spanish.

**Reading Comprehension Passage:** “Bringing Solar Power to Indian Country: With solar energy, we can be independent.” By Debby Tewa. From *Heroes of the Environment*

Until she was ten years old, Debby Tewa lived with her grandmother in a three-room stone house in a remote area of the Hopi Reservation in Arizona. She remembers exploring the desert with her cousins and swimming in little ponds. Like other families around them, Debby and her grandmother never had running water or a telephone, or electrical power. For heating, cooking, and lighting, they used coal, wood, and kerosene. “I didn’t miss electricity then,” Debby recalls. “I didn’t know that I didn’t have it.”

Debby is a solar electrician – and a light-bringer. She brings electric light and power to some of the most isolated places on the Hopi and Navajo reservations – communities like the one where she grew up. “I can identify with the people I’m helping,” she says. “I really understand their excitement when they turn on a light for the first time.”

Hopi land has been home to Debby’s family for many generations. It is a beautiful, dry desert environment, with three major mesas (rocky tables of land) that rise as high 7,200 feet (nearly 2,200 meters). Surrounding the mesas are low-altitude deserts and gullies. Most people live either in the 12 traditional villages on top of the mesas or in modern communities below. The high-mesa villages are famous around the world for their culture and long history. Old Oraibi, for example, is believed to be the oldest inhabited community in the United States – established more than 850 years ago, around the year 1150.

Many Hopi households are connected to the electrical grid, which means they get electricity from the power company’s lines, like most city-dwellers all over the country. But several hundred households on the 1.6 million – acre (647,000-hectare) reservation are too far away from the power lines to hook into the grid.

Debby was in the fourth grade and living with her parents off the reservation when she first had electricity at home. “I liked being able to study at night and watch TV,” she remembers. She started thinking about how she could help bring electricity to places like her grandmother’s community.

After graduating at the top of her class from Sherman Indian High School in California, Debby returned to the Hopi Reservation, where she took a job helping other young people find summer work.

One day, a woman came to the office to recruit boys to attend trade school. “Can girls go too?” Debby asked. When the woman said yes, Debby jumped at the chance.

“We could choose electricity or plumbing,” Debby remembers. “At first, I chose plumbing because I was scared of electricity. Then a couple of Hopi classmates wanted me to come over to electricity. They promised they would help me out if I did. And sure enough, they did help.” Later, she got to help them when they worked together on jobs. “I’m lucky because I’ve always had a lot of support for what I’m doing.”

Debby’s next big opportunity came in 1987, when The Hopi Foundation, created by Hopi people to improve life on the reservation, started an organization called Native Sun. The idea was to bring energy to isolated Hopi communities in a way that would fit in with their traditional way of life. Solar energy seemed like a perfect solution. It didn’t cause the pollution and health problems that coal-powered plants did. It was silent, it was easy to install, and it required very little maintenance. Best of all, since the energy was coming from the sun, it was “renewable” energy, meaning the supply won’t get used up.

Solar power would also enable Hopi households to be “energy independent,” because they wouldn’t have to rely on energy from power companies outside their land. To spread the

word about solar energy, The Hopi Foundation recruited several members of the tribe who could speak the Hopi language. One of them was Debby Tewa.

Part of Debby's job was to teach people about solar energy - how to choose the right solar electric system, how to use it, and how to take care of it. "I wanted them to feel that it was theirs." But first, she had to get people interested.

Debby set up demonstration solar power systems in three villages on the mesas. People came to see how solar panels could be wired into their houses so they could have electricity. A 90-year-old woman was amazed that she could flick a switch and light would come on. A seamstress could use an electric sewing machine. Kids could do schoolwork and watch TV at night. And they didn't have to pay for the new system because Native Sun offered loans to their customers.

When people wanted to try it out, Debby loaned them a small trailer-mounted system for a week. This helped them decide how large a system they wanted, and then Debby would drive out and install it.

She would strap on her tool belt, climb up a ladder onto the roof, and go to work. Sometimes she would be on top of a 200-year-old stone house, looking out over a hundred miles of low desert and high mesas. In the next few years, Debby installed more than 300 solar panels on Hopi houses, and people on the reservation started calling her "Solar Debby." She also installed solar panels on the neighboring Navajo Reservation and trained other electricians, especially women, in as places as far away as Ecuador in South America.

Debby has four solar panels in her own house on the reservation. That's enough for lights and TV. "It's not like the power lines bring," she says, "but it's enough."

For people like Debby's aunt and her aunt's 90-year-old neighbor, who had never had electricity before, solar power has made a life-changing difference. They no longer have to read by the light of a propane lamp. But best of all, they know that they have control over their own electricity.

When you get your own solar electrical system, it's yours," Debby explains. "You're not dependent on a power company. With solar energy, we can be independent."

### **Comprehension Questions on “Bring Solar Power to Indian Country” by Debby Tewa**

1. How was Debby Tewa’s childhood?
2. What is the Hopi Reservation? Explain its terrain and its habitants.
3. How did Debby get involved in solar energy? (**For extended activity only: Make a timeline of the events leading to this**)
4. What is solar energy, and what are its pros and cons?
5. What are “mesas”?
6. How do you control electricity using solar energy?
7. How were the people she was helping impacted?
8. What were the people able to do using solar energy?

## ***Lesson Plan 12: Composting***

- 1. Compatible with Curriculum Map Unit 8.6: Making Healthy Choices**
  - 2. Environmental Theme:** Composting
  - 3. Topic:** Journal Keeping / Reflective Writing
  - 4. Big Picture:** The Decisions we make impact us and those around us.
  - 5. Essential Question:** Why should we recycle our leftover food scraps?
  - 6. Reflection:** “The composting process produces no waste, no pollutants and no toxic by-products.” Joseph Jenkins
  - 7. General Strategy:**

**E.C.A**      Phase: x Exploration x Conceptualization x Application

**Reading Trilogy**      Phase: x Before      x During      \_\_\_\_\_ After



## **9. Expectations:**

**L/S. 8.3** Uses appropriate language structure to interact in discussions and presentations, to problem solve, explain a process, and express opinions integrating comparison and contrast statements to interact in discussions and presentations.

**W.8.1** Combines sentences and ideas using simple transitional phrases; applies commas and colons to correctly punctuate sentences, identifies phrases and clauses; applies phrases in writing to construct complex sentences.

- 10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objectives:** Throughout several activities the student will be able to:

**Conceptual:** After viewing the YouTube video “Top Tips on how to make compost”,

students will apply a variety of language patterns as they react to the video clip.

**Procedural:** Prior to watching the video clip, students will complete the first two columns of a KWL graphic organizer as a way of assessing prior knowledge. They will proceed to complete the final part after viewing the video clip on how compost can be generated at home.

**Attitudinal:** As students commit themselves to starting their own backyard or balcony composting, they will cultivate environmentally friendly practices that could have lifelong ramifications. By discussing the video openly, students will overcome speaking anxieties.

**12. Assessment Techniques:** Journal keeping, KWL graphic organizer, oral discussion

**13. Activities:**

**Initial:** Students will complete the first two columns of a KWL graphic organizer as a way of assessing prior knowledge and answer close-ended questions on the relevance of composting our food scraps.

**Development:** Students will watch the video and analyze the content in order to draw out the main ideas.

**Closing:** Students will proceed to complete the third column of the KWL graphic organizer and share their views with the class.

**14. Materials: Video clip, computer, projector, journal, KWL graphic organizer.**

**15. Extended Activities:**

**12a. Composting At Home**

Students will use scraps and dry leaves to begin the composting process. They will keep a journal in which they describe the process with dense descriptions. If necessary, they could draw and paint for illustration purposes. They will be expected to record a detailed analysis of steps taken throughout the process. Compost generated could be used as fertilizer at home or school.

Name: \_\_\_\_\_

Date \_\_\_\_\_

KWL Chart: Before you begin watching the documentary on composting, list details of what you know and what you want to learn about composting in the first two columns. Fill in the last column after viewing the video clip.

<b>Topic</b>		
<b>What I Know</b>	<b>What I Want to Know</b>	<b>What I Learned</b>

## ***Lesson Plan 13: Growing Our Own Food I***

- 1. Compatible with Curriculum Map Unit:** 8.1- Analyzing Characters' Decision
  - 2. Environmental Theme:** Planting
  - 3. Topic:** Expository Writing and Read Comprehension (pre-writing strategy) “Plants Are Our Friends” from Kid’s Herb Book by Leslie Tierra
  - 4. Essential Question:** “Why grow your own food?”
  - 5. Big Picture:** a) The decisions we make impact us and those around us. b) Characters’ decisions advance the plot (CM)
  - 6. Reflection:** “Don't judge each day by the harvest you reap but by the seeds that you plant.” Robert Louis Stevenson
  - 7. General Strategy:**

E.C.A	Phase: x Exploration	x Conceptualization	x Application
<b>Reading Trilogy</b>	Phase: x Before	x During	x After
<b>8. Curriculum Connection:</b>	x Spanish	x Science	x Technology
	x Physical Education	x Agricultural Science	

**9. Expectations:**

**L/S.8.1** Listens and responds during a read aloud from a variety of fiction and nonfiction to comprehend, generalize, relate to character and setting, identify tone, voice, and mood; makes connections to text

**R.8.5** Distinguish between fact and opinion in narrative and expository texts; states and paraphrases main idea or topic, and determines important details.

**W.8.1.** Classifies and applies the parts of speech, uses vocabulary, accurate spelling, appropriate grammar and syntax in writing.

**10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objective:** Throughout several activities, the student will be able to:

**Conceptual:** After reading the expository writing titled “Plants Are Our Friends” which is an excerpt from the book *Kid’s Herb Book* by Leslie Tierra and listening to the explanations of the teacher, students will be able to identify the elements of expository writing effectively.

**Procedural:** Having listened to the teacher’s explanation of the basic tenets of expository writing, students will apply appropriate grammar and syntax in writing an expository piece on any herb of their choice according to established criteria. Also, students will plant their vegetable or herb of choice in a paper cup as part of a class gardening initiative, which would include journal keeping on the progress of the plant.

**Attitudinal:** By participating in the class gardening initiative, students will appreciate the value of working both cooperatively as a team and individually as a responsible caretaker of the environment.

**12. Assessment Techniques:** a) Reflection paragraph, b) Journal Keeping

**13. Activities:**

**Initial:** The class will begin with the students orally discussing the question, “Should you grow your own food and why?” This will go on for ten minutes. They could draw inspiration from the reflection of the day, which is written on the board.

**Development:** Students will volunteer to read sections of the expository writing titled, “Plants Are Our Friends” which is an excerpt from the book, *Kid’s Herb Book* by Leslie Tierra. At intervals, the teacher will require students to make predictions about the plot development using context cues.

**Closing:** Students will write a paragraph of eight to ten sentences in response to the excerpt “Plants Are Our Friends”. Students will be encouraged to make self to text connections as they develop their thoughts about the reading.

**14. Materials:** “Plants Are Our Friends” is an excerpt from the book- Kid’s Herb Book by Leslie Tierra, Projector, Worksheet, Notebook.

**15. Extended Activity:**

**13a. Journal Keeping (Culinary Herb Growing Process)**

Have students plant their herb/vegetable seeds on a plot of land on the school property or at home in a pot or directly in the soil.

Students will be expected to measure the progress of the plants regularly and note their observations in their journal over the space of three months.

At the end of the semester, students will be expected to prepare and bring a dish/salad prepared with the herb or vegetable they planted.

The students will present their recipes before the class, after which the meals will be shared in harmony among the students.

**13b. Expository Writing on any Culinary Herb of Choice**

Students will research an herb and write three to five paragraphs about its origin, scientific information, functions, uses, etc. The expository papers will be presented in class or discussed in groups, so students can benefit from each other’s research.

## **Lesson Plan 14: Growing Our Own Food II**

- 1. Compatible with Curriculum Map Unit:** 8.1- Analyzing Characters' Decision
- 2. Environmental Theme:** Gardening/Planting Process
- 3. Topic: Short Stories-** Kim: Growing My Own Food (Reading Excerpt from *Seedfolks* by Paul Fleischman) / Expository Writing
- 4. Big Picture:** Growing My Own Food
- 5. Essential Question:** What are the benefits of growing our own food as a community?
- 6. Reflection:**

“The garden is a community.

It is a dynamic alliance of organisms depending upon each other.

When too few remain, the community loses its vitality and all perish together.

The garden can teach us that our strength is in our neighbors.”

Adapted from “What the Prairie Teaches Us” by Paul Grunchow

- 7. General Strategy:**

**E.C.A**                          Phase:  Exploration  Conceptualization  Application

**Reading Trilogy**      Phase:  Before       During       After

- 8. Curriculum Connection:**       Spanish       Science       Technology

Physical Education       Agricultural Science

- 9. Expectations:**

**L/S.8.1** Listens and responds during a read aloud from a variety of fiction and nonfiction to comprehend, generalize, relate to character and setting, identify tone, voice, and mood; makes connections to text.

**W.8.1.** Classifies and applies the parts of speech, uses vocabulary, accurate spelling, appropriate grammar and syntax in writing.

**10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objectives:** Throughout several activities the student will be able to:

**Conceptual:** During a read aloud by both teacher and students, students will make predictions about the plot development in the short story- Kim from *Seedfolks* by Paul Fleischman as they respond to open-ended questions according to established criteria.

**Procedural:** Following the instructions given, students will analyze how Kim's decision moved the plot according to established criteria.

**Attitudinal:** By responding effectively to open-ended questions about plot development, students will overcome their fear of using English language openly and by so doing, demonstrate individual responsibility.

**12. Assessment Techniques:**

**13. Activities:**

**Initial:** The class will begin with the bell work which consists of a 15 minutes pre-reading writing activity. Students will write a paragraph on their impression of growing our own food. They could draw inspiration from the reflection of the day, which is written on the broad.

**Development:** The teacher and students will take turns reading the short story- Kim. At interval, the teacher will require students to make predictions about the plot development using context cues. Students will openly discuss their response to Kim's resolve to ensure that the lima beans that she planted survive at all cost. Students will be encouraged to make connections to the text.

**Closing:** Students will complete the Story Structure Chart by writing details of the story plot in the appropriate box.

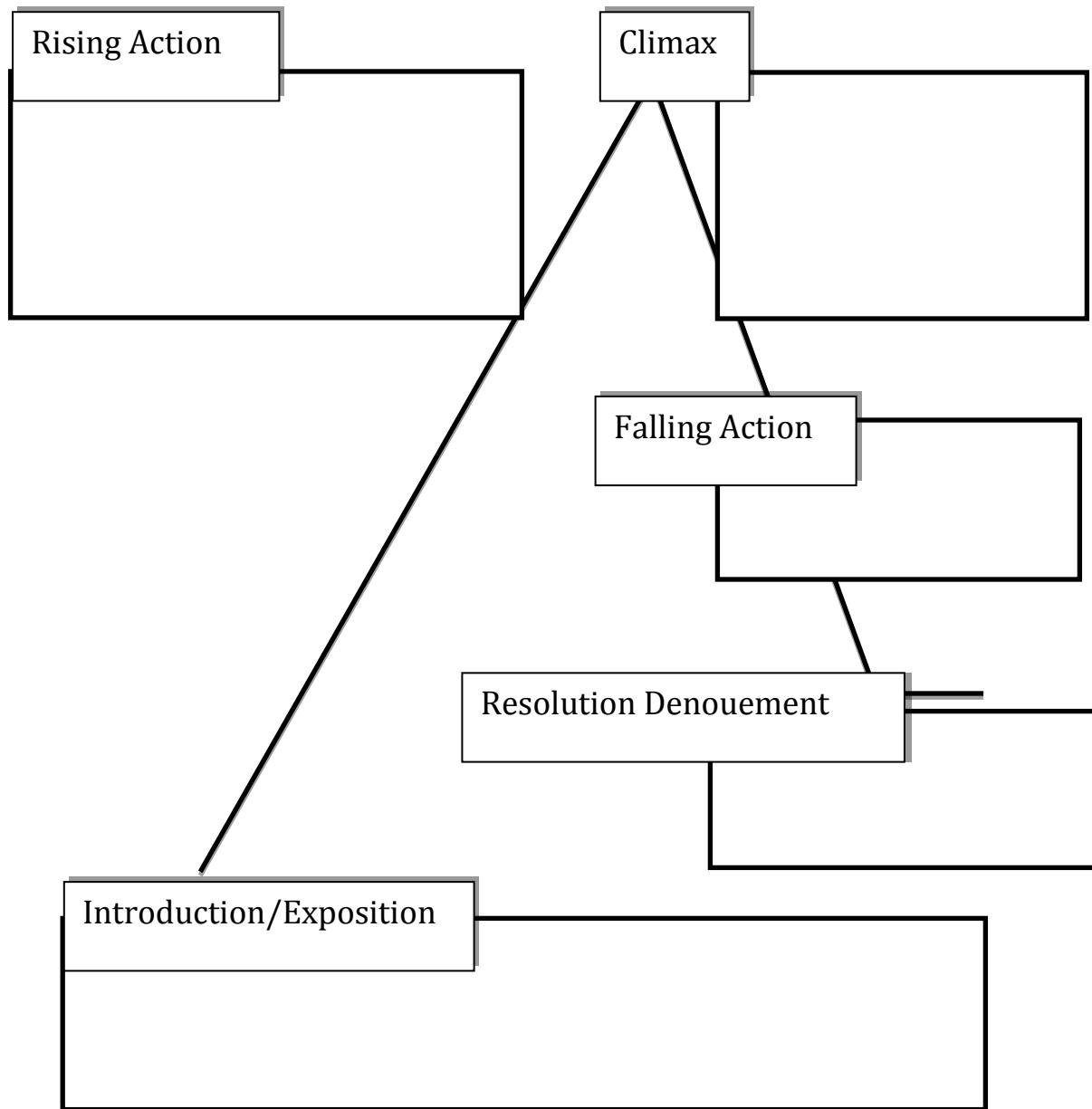
**14. Materials:** Story Handouts, Projector, Worksheet, Notebooks

**15. Extended Activities:**

**14a. Staple Food Research Paper (five-Paragraph Expository Essay)**

Students will identify locally grown crops. Each student will select a different staple food that is grown and consumed in Puerto Rico for this writing assignment. They will research how much of it is grown locally and how much of it is imported from other countries. Students will research the importance of food production to nation building and economic self-reliance. They will make recommendations about how food production can be increased in Puerto Rico.

## Story Structure Chart



## ***Lesson Plan 15: Tree Planting (6 days)***

- 1. Compatible with Curriculum Map Unit: 8.4 Decisions that Shaped My Beliefs**
  - 2. Environmental Theme: Tree Planting / Plant Appreciation Day (PAD) on April 14**
  - 3. Topic:** Analyzing Informational Texts / Reflective Writing
  - 4. Big Picture:** How one individual can make a difference
  - 5. Essential Question:** Why do decisions matter? How do our decisions shape our lives and future?
  - 6. Reflection:** “He who plants a tree, plants a hope.” Lucy Larcom, Plant a Tree
  - 7. General Strategy:**

**E.C.A**      Phase:  Exploration     Conceptualization     Application

**Reading Trilogy**      Phase: x Before      x During      x After



## **9. Expectations:**

**L/S.8.1** Listens and responds during a read aloud from a variety of fiction and nonfiction to comprehend, generalize, relate to character and setting, identify tone, voice, and mood; makes connections to text.

**R.8.5** Distinguish between fact and opinion in narrative and expository texts; states and paraphrases main idea or topic, and determines important details.

**W.8.1.** Classifies and applies the parts of speech, uses vocabulary, accurate spelling, appropriate grammar and syntax in writing.

- 10. Depth of Knowledge:** Extended Thinking (IV)

**11. Operational Objectives:** Throughout several activities the student will be able to:

**Conceptual:** By reading informational texts such as the mini-book, *The Man Who Planted Trees* by Jean Giono; ‘Indian Man, Jadav “Molai” Payeng, Single-Handedly Plants A 1,360 Acre Forest In Assam’; and ‘The Story of Wangari Maathai’, students will comprehend the essence of environmental stewardship and tree planting. They will establish authors’ purpose and make connections to the texts.

**Procedural:** After reading the mini-book, *The Man Who Planted Trees* by Jean Giono, and the articles on tree planting crusaders, students will write a one-page reflection on the contributions of these heroes of the environment. In addition, students will listen to the song ‘Planting Trees’ by Andrew Peterson and critically analyzing the song’s message.

**Attitudinal:** By focusing on texts which emphasize the centrality of tree planting and the heroes who sacrificed everything to save trees, the students will grasp the true essence of social responsibility and environmental stewardship.

**12. Assessment Techniques:** Reflective writing, Year-long Journal Keeping, Oral Responses, Crossword Puzzles

**13. Activities:**

**Initial:**

Day 1-3. Students will take turns reading the mini-book titled, ‘The Man Who Planted Trees’ by Jean Giono.

Day 4. Students will read the true-life stories of Wangari Maathai and Jadav “Molai” Payeng.

Day 5. Students will listen to the YouTube video recording of the song, ‘Planting Trees’ by Andrew Peterson.

Day 6. Students will work in small groups as they engage in a webquest at the school library in order to research tropical trees grown in Puerto Rico. They will focus on questions such as: What kind of soil and nutrients do various trees need? What is the impact of planting trees to long-term economic and environmental sustainability? What is the substantive value of tree planting to the ecosystem? How are tropical trees planted? What are the various uses of trees?

**Development:**

Day 1-3. At intervals during the reading of the reading of the mini-book, students will make inferences about plot development and comment on Giono's decisions.

Day 4. After reading the story of Wangari Maathai, invite a local tree planting activist to speak to the class for twenty minutes about the importance of tree planting.

Day 5. Students will get in groups to discuss their favorite stanza of the song- 'Planting Trees'; afterwards, the entire class will come together to share what was discussed in the various groups.

Day 6. The class will discuss the school tree-planting initiative in association with the Agriculture teacher. To reinforce the concept of recycling, students will be encouraged to transplant baby trees which have little chance of survival where they sprouted; they will replant the baby trees in more favorable locations on the school property. The actual tree-planting activity could take place on a separate date based on the availability of the agriculture teacher.

**Closing:**

On all days, the teacher will clarify students' questions and doubts.

**14. Materials:** Mini-book titled *The Man Who Planted Trees*; two handouts on the true stories of Wangari Maathai and Jadav "Molai" Payeng; 'Planting Trees' lyrics by Andrew Peterson; Projector.

**15. Extended Activities:**

**15a. Year-long Tree Planting Journal**

Have students keep a year-long journal where they detail the progress of the particular tree they helped to transplant or plant on the school property. They will document the life of the tree with dense descriptions and pictures at various stages. A minimum of four journal entries per month will be required. Discuss your feelings and thoughts about observing your tree as it grows from one month to the next.

**15b. 'Focus On A Tree' Brainstorming Activity**

In groups, have students participate in a brainstorming competition about books, stories, poems, movies, and paintings in which trees feature prominently. This activity can be modified into a game: "Play a game of "trees on the spot." The person who is "it" points to another person and says, "Book," "Song," "Poem," "Movie" or "Painting." The person pointed to has 15 seconds to name a title of a book, song, movie, etc. in which trees are important."

(Teaching.monster.com)

**15c. Tree Anatomy Crossword Puzzle**

Have students work in groups to create crossword puzzles which emphasize the various parts of a tree and their functions. Next, the puzzles will be printed and students in various groups will complete the puzzles designed by other groups corporately.

**Reading Comprehension 1-** "Indian Man Single-handedly Plants a 1,360-acre Forest: Jadav Payeng turned a barren sandbar in northern India into a lush new forest ecosystem." By Stephen Messenger

More than 30 years ago, a teenager named Jadav "Molai" Payeng began planting seeds along a barren sandbar near his birthplace in India's Assam region, the Asian Age reports. It was 1979 and floods had washed a great number of snakes onto the sandbar. When Payeng -- then only 16 -- found them, they had all died.

"The snakes died in the heat, without any tree cover. I sat down and wept over their lifeless forms," Payeng told the Times Of India.

"It was carnage. I alerted the forest department and asked them if they could grow trees there. They said nothing would grow there. Instead, they asked me to try growing bamboo. It was painful, but I did it. There was nobody to help me," he told the newspaper.

Now that once-barren sandbar is a sprawling 1,360 acre forest, home to several thousands of varieties of trees and an astounding diversity of wildlife -- including birds, deer, apes, rhino, elephants and even tigers.

The forest, aptly called the "Molai woods" after its creator's nickname, was single-handedly planted and cultivated by one man -- Payeng, who is now 47. According to the Asian Age, Payeng has dedicated his life to the upkeep and growth of the forest. Accepting a life of isolation, he started living alone on the sandbar as a teenager -- spending his days tending the burgeoning plants.

Today, Payeng still lives in the forest. He shares a small hut with his wife and three children and makes a living selling cow and buffalo milk. According to the Assistant Conservator of Forests, Gunin Saikia, it is perhaps the world's biggest forest in the middle of a

river.

"We were surprised to find such a dense forest on the sandbar," Saikia told the Times Of India, adding that officials in the region only learned of Payeng's forest in 2008.

Finally, Payeng may get the help -- and recognition -- he deserves. "[Locals] wanted to cut down the forest, but Payeng dared them to kill him instead. He treats the trees and animals like his own children. Seeing this, we, too, decided to pitch in," Saikia said.

## **Reading Comprehension 2: An Excerpt from Wangari Maathai's Nobel Peace Prize**

### Acceptance Speech in 2004

"As the first African woman to receive this prize, I accept it on behalf of the people of Kenya and Africa, and indeed the world. I am especially mindful of women and the girl child. I hope it will encourage them to raise their voices and take more space for leadership.

In 1977, when we started the Green Belt Movement, I was partly responding to needs identified by rural women, namely lack of firewood, clean drinking water, balanced diets, shelter and income.

Throughout Africa, women are the primary caretakers, holding significant responsibility for tilling the land and feeding their families. As a result, they are often the first to become aware of environmental damage as resources become scarce and incapable of sustaining their families. Tree planting became a natural choice to address some of the initial basic needs identified by women. Also, tree planting is simple, attainable and guarantees quick, successful results within a reasonable amount time. This sustains interest and commitment.

So, together, we have planted over 30 million trees that provide fuel, food, shelter, and income to support their children's education and household needs. The activity also creates employment and improves soils and watersheds. Through their involvement, women gain some degree of power over their lives, especially their social and economic position and relevance in the family. This work continues.

In the process [of planting trees] the participants discover that they must be part of the solutions. They realize their hidden potential and are empowered to overcome inertia and take action. They come to recognize that they are the primary custodians and beneficiaries of the environment that sustains them.

Entire communities also come to understand that while it is necessary to hold their governments accountable, it is equally important that in their own relationships with each other, they exemplify the leadership values they wish to see in their own leaders, namely justice, integrity and trust.

Through the Green Belt Movement, thousands of ordinary citizens were mobilized and empowered to take action and effect change. They learned to overcome fear and a sense of helplessness and moved to defend democratic rights.

In time, the tree also became a symbol for peace and conflict resolution, especially during ethnic conflicts in Kenya when the Green Belt Movement used peace trees to reconcile disputing communities. During the ongoing re-writing of the Kenyan constitution, similar trees of peace were planted in many parts of the country to promote a culture of peace.

Using trees as a symbol of peace is in keeping with a widespread African tradition. For example, the elders of the Kikuyu carried a staff from the thigi tree that, when placed between two disputing sides, caused them to stop fighting and seek reconciliation. Many communities in Africa have these traditions.

Such practices are part of an extensive cultural heritage, which contributes both to the conservation of habitats and to cultures of peace. With the destruction of these cultures and the introduction of new values, local biodiversity is no longer valued or protected and as a result, it is quickly degraded and disappears. For this reason, The Green Belt Movement explores the concept of cultural biodiversity, especially with respect to indigenous seeds and medicinal plants. As we progressively understood the causes of environmental degradation, we saw the need for good governance. Indeed, the state of any county's environment is a reflection of the kind of governance in place, and without good governance there can be no peace. Many countries, which

have poor governance systems, are also likely to have conflicts and poor laws protecting the environment.

In 2002, the courage, resilience, patience and commitment of members of the Green Belt Movement, other civil society organizations, and the Kenyan public culminated in the peaceful transition to a democratic government and laid the foundation for a more stable society."



**Handout: Planting Trees**

by Andrew Peterson

We chose the spot, we dug the hole

We laid the maples in the ground to have  
and hold

As Autumn falls to Winters sleep

We pray that somehow in the Spring

The roots grow deep

And many years from now

Long after we are gone

These trees will spread their branches out

And bless the dawn

He took a plane to Africa

He gathered up into his arms

An orphan son

So many years from now

Long after we are gone

This tree will spread its branches out

And bless the dawn

So sit down and write that letter

Sign up and join the fight

Sink in to all that matters

Step out into the light

Let go of all that's passing

Lift up the least of these

Lean into something lasting

Planting trees

She rises up as morning breaks

She moves among these rooms alone

Before we wake

And her heart is so full; it overflows

She waters us with love and the children

grow

So many years from now

Long after we are gone

These trees will spread their branches out

And bless the dawn

These trees will spread their branches out

And bless someone

## **Chapter 6: Conclusion**

### **Introduction**

The purpose of this research was to incorporate environmental education topics into the existing eighth grade curriculum in Puerto Rico. The idea was to explore how to accomplish the task effectively in a way that inspires, empowers, and compels students and teachers to become ecologically literate and responsive.

In this research, I set out to answer three questions, and the first question is: “what does a group of eighth grade students from a school in Mayaguez know about environmental themes?” To answer the question, the first part of the questionnaire posed questions about environmental pollution, energy conservation, global warming and environmental crisis in general in order to find out the students’ background knowledge of enduring environmental issues of our time. The results were mixed. Whereas 83% of students answered the questions on causes of environmental pollution correctly, only 60% and 53% of the students responded correctly to the questions regarding energy conservation and global warming respectively. As noted earlier, these are information that the students should have been exposed to from fourth to sixth grade according to the DE Curriculum framework for social science and science.

The most revealing aspect of the questionnaire is actually the first three items on the questionnaire that required students to provide original written responses and not multiple question responses. These three items turned out to be most challenging for the students as they revealed that a significant number of students lack relevant knowledge of very basic information in the areas assessed. If they were taught global warming and energy conservation in elementary school as the curriculum framework suggests, then it is obvious they did not retain the information they received in the traditional classroom setting. The study has been an effort at

suggesting a cross-disciplinary approach to teaching environmental issues by helping students understand our interconnectedness and make relevant connections with the biophysical world, other species, and one another. The results of the data collected goes to show that a fragmented environmental education, which is limited to the science class, cannot effectively afford students the balanced knowledge, skills, and awareness needed to nurture a strong sense of affinity or empathy for environmental issues.

**Research question #2: What are the attitudes of a group of eighth grade students regarding environmental themes? How can environmental/ecological themes be integrated into the existing Curriculum Map for eighth grade?**

Part of the questionnaire which sought to assess the students' attitude regarding environmental themes revealed that while many students have positive environmental attitude, a considerable number of students do not have pro-environmental attitudes. When asked whether they enjoy nature-related activities, 29% of the students indicated disapproval of some sort to the approach. Data from item seven on the questionnaire revealed 40% of the students answered "undecided" when asked whether reading texts and stories that focus on planning would improve their understanding of the phenomenon. A considerable number of students chose the option of "undecided" in response to the questions related to their attitude to EE. The preference for "undecided" is indicative of the fact that such students do not have strong feelings or persuasions about environmental subjects.

The activities and readings suggested in this study aim at simplifying the pertinent topics and engaging students in hands-on, minds-on, practical activities. Extended activities such as games, scrapbooks, and hand craft are included in the green options suggested in Chapter five of this work with the aim of motivating and inspiring students to develop empathy for

environmental themes and problems. Such experiential approaches to environmental education may be the missing dimension which has prevented students from forming strong connections to pro-environmental causes. When concepts are presented in a way that is relevant to students' lived experiences, and in a way that celebrates individual student's potentials, it increases their sensibility to environmental issues. The indifference reported by a significant percentage of the students justifies the premise of this study which was to offer a plausible alternative to a fragmented EE. The alternative consists of a combined, cross-disciplinary approach to ecological literacy which incorporates reading green, creative writing, fine arts, crafts, and outdoor education.

**Research Question #3: What are the behavioral patterns of a group of eighth grade students regarding environmental engagement? What kinds of instructional strategies/lesson plans, which meet the Department of Education's Content Standard and Grade-level Expectations for eighth grade, can be developed with the view of encouraging environmental agency and engagement?**

Data gathered from part 3 of the questionnaire, which exposed the students' behavioral patterns regarding environmental engagement and practices, shows that on the issue of recycling, 47% of the students either rarely or never recycle their plastic, aluminum cans, paper and/or glass. With the exception of the responses to questions about line-drying clothes and turning off lights when they are not in use, all responses in this part of the questionnaire revealed considerable neutrality or indifference to environmental activities and concerns.

This is consistent with the attitude of indifference which a significant percentage of the students reflected in Part II of the questionnaire that assessed their environmental attitudes and values. Ultimately, as Grant and Littlejohn (2004) indicated, "we protect what we care about, and

we care about what we know well.” (p. xv) In general, the students’ knowledge of environmental topics is limited; therefore, it is not surprising that many of them have not cultivated sound environmental attitudes and practices. While awareness of environmental issues may not automatically translate into environmental stewardship, it is safe to say that students who are encouraged to explore the biophysical world, as well as critically reflect on complex environmental problems are more likely to develop the negotiating skills and creativity needed to tackle our enduring environmental problems. We cannot continue to teach environmental topics in abstraction, and exclusively in the science class, and expect students to make authentic experiential connections with nature, other people, and other species. The relevant materials, activities, stories, and fun games suggested in Chapter Five of this study force students to notice, understand, react and act on diverse pro-environmental topics.

### **Suggestions for Future Research**

Even though the concept of linking language and the environment has become a movement in the United States and elsewhere around the world, the model is yet to develop in any significant measure in Puerto Rico. The theoretical framework for such a model in Puerto Rico would include locally-generated texts, stories, and environmental activities that feature familiar place and concerns on the island. The fundamentals of an innovative multi-disciplinary environmental education would affect how Puerto Rican students view their social and natural world in an age of environmental crisis.

Since the sample size for this study was small, no generalization can be made based on the findings of this study. Future studies should be conducted on a larger scale and if the results realized are consistent with the findings of this study, then further research should probe why many students in middle school are not knowledgeable about environmental issues. Future

research in the area should incorporate interviews with both teachers and students in order to determine why students, who should have come across environmental concepts in elementary school, still have serious problems identifying the causes of pollution and global warming in eighth grade.

Here in Puerto Rico, there is a dearth of EE materials in English for ESL students. While I was able to find children's literature that explores environmental issues, I was unable to find short stories written in English by Puerto Rican authors that focus on environmental concerns. Designing and developing effective materials and teaching tools with local content that would facilitate the incorporation of a wide spectrum of environmental topics in the ESL classroom should be a priority for future research in this area. As the CM goes through future reviews, one would hope that more effort would be made to modify the English Curriculum to include environment-leaning topics and stories.

Future studies should go beyond articulating a theoretical framework for the implementation of EIC in Puerto Rican schools and develop into integrative practice which would include outdoor education, edible school gardens, expeditions, and action-oriented assessment.

Also, practical attempts at incorporating EE in the ESL classroom in Puerto Rico must involve partnership between teachers, as well as partnership with the broader community and businesses to ensure that students receive relevant, hand-on, exploratory exposure to environmental subjects.

### **Limitations of Study**

One of the main limitations of the study is that it did not incorporate outdoor education in its methodology. The public school where the questionnaire was administered is a typical public

school in the western side of Puerto Rico where students rarely engage in learning outside the classroom setting. This study is hugely theoretical as I tried to provide green options that would inspire students to become environmentally aware. While there's value to laying out a theoretically framework for EE incorporation in the ESL classroom, the essential aspect of EIC is the practical, exploratory learning both inside and outside the classroom setting.

Another limitation is the small sample size from which the data was collected and analyzed; the needs analysis was determined based on the small sample size as well. Thus, on that premise, it is less likely that the findings from this study would constitute the basis for extensive generalizations about the knowledge, attitudes and behaviors of eighth graders as it pertains to environmental literacy.

The study was limited to students at a particular middle school in Mayaguez, so it consequently lacks randomization. The convenience sampling is based on selecting the respondents of a study from the nearest individuals (Cohen, Manion, & Morrison, 2007). Perhaps a larger study with a mix of students from different schools may have revealed other results.

Furthermore, the fact that the green options were not implemented as part of this study, even though I have done so of my own accord, constitutes a major limitation of the study. The survey was strictly for the purpose of needs assessment; an inclusion of a pre- and post-test would have provided some insight about how the students respond to the various lessons and assessment techniques.

### **Final Thoughts**

The integration of environmental education (EE) in every subject area is long overdue and educational systems around the world necessarily need to consider making significant changes in curriculum development that inspire, empower and compel students and teachers to

become ecologically literate and accept the centrality of sustainable living. This is particularly relevant for English Education because of the strong connection between literature and nature. EE can find a natural home in ESL classrooms because of the strong focus on contextual cues as opposed to a strict emphasis on linguistic forms.

Even though outdoor assessment was not part of the methodology for this study for logistic reasons, I have used the vast majority of the activities and readings that I proposed in Chapter Five of this thesis in my classroom. I have had students tell me that the “Making a difference Project” is, by far, the most impacting project they have ever undertaken. Incorporating EIC in my ESL classroom has immensely enriched my teaching. I have found that beyond facilitating inquiry and creativity in my students, I have personally been transformed by this praxis. It has been both a personal and collaborative quest as I explore a varied mix of strategies and approaches to connecting language studies to the environment. Having been absorbed in this effort for the last couple of years, I am convinced that incorporating EE in any subject area, particularly language studies, changes the way one perceives language education, the natural world and social realities.

I have come to the realization, as well, that the integration of EE in any English program will involve extensive collaboration between students, teachers, school administration and the larger community. Having students involved in every stage of the EE implementation process is particularly important because it fostered in the students the sense of ownership in their learning experience. The students’ heightened sensibility to environmental causes is at the heart of this entire endeavor, so it stands to reason that they should be involved in the design and development of any such initiative. William & William (2011) maintain that “with regard to students, very little if any learning can occur unless students are motivated on a consistent

basis" (p. 1). Without a doubt, enhanced motivation on the part of students, teachers, and other members of the school community is a principal determinant of the overall outcome of any multidisciplinary approach to environmental literacy. If environmental literacy is to become a constant reality for mainstream students, then getting the students to think outside-the-box and employing diverse teaching strategies that will challenge them to want to learn and discover new things should be uppermost on the teacher's agenda.

Organizing school expeditions to botanical gardens in Puerto Rico and natural attractions around the island is another way of cementing environmental knowledge in the memories of students because such learning occurs in non-traditional and exciting situations. In an age of consumerism and urbanization, the benefits of taking young students on expeditions to botanical gardens and green houses are considerable. Even here in Puerto Rico where there is sunlight throughout the year, students' attention needs to be drawn to the centrality of ecological sustainability to human survival on our planet. Students need to make the connections between the outdoors and all the subjects taught in the various subject areas (Mazor & Fink, 2011).

So much has been said about curriculum integration and research in the area suggests that students are better placed to retain knowledge and construct new knowledge when content-based knowledge is taught across disciplines. It is time to take the conversation further and begin to explore multidisciplinary, creative and practical ways of integrating EE into every classroom.

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## **Appendix A: Solicitud de Asentimiento**

Universidad de Puerto Rico

Recinto Universitario de Mayagüez  
Colegio de Artes y Ciencias  
Departamento de Inglés

### **SOLICITUD DE ASENTIMIENTO**

Mi nombre es Stephania Uwakweh. Actualmente estoy inscrita en el programa de Maestría en Educación en Inglés en el Recinto Universitario de Mayagüez de la Universidad de Puerto Rico. Para mi tesis de maestría, que estoy en el proceso de escribir, estoy interesada en diseñar una unidad didáctica multidisciplinaria para estudiantes de octavo grado que integre la educación ambiental al currículo de inglés.

Para lograr este objetivo, tengo que hacerles a los estudiantes de octavo grado una serie de preguntas por medio de un cuestionario. Te estoy invitando para que seas parte del estudio. Tu participación, que es completamente voluntaria, te tomará más o menos 30 minutos y consiste en completar un cuestionario.

El Departamento de Educación no será responsable del proceso ni del resultado del siguiente proyecto de investigación. Yo, como profesora, tomo la responsabilidad absoluta del resultado del mismo. Se trata de un estudio de riesgo mínimo, por lo que, en caso de que aceptes participar, la probabilidad de cualquier daño que te ocurra será prácticamente insignificante. No es necesario que escribas tu nombre en el cuestionario. Voy a juntar lo que aprenda de ti con lo que aprenda de otros estudiantes, por lo que nadie podrá decir cuál es realmente la información tuya. Cuando hable con otras personas de mi estudio, no voy a identificar la escuela, así que nadie va a poder decir a qué alumnos de octavo grado me refiero. Los datos que se recojan se guardarán bajo llave en un archivo.

Tus padres o tutores han dicho que está bien que puedas completar el cuestionario para mí, y ahora te toca a ti decidir si quieres hacerlo. Puedes decir que no o decir que sí. Además, si decides ahora que quieres participar y luego cambias de opinión, también está bien. Eres libre de retirarte del estudio en cualquier momento sin penalidad alguna.

Mi número de teléfono es el (787) 420-6523. Me puedes llamar con respecto a cualquier pregunta que puedas tener sobre este estudio. Tendrás una copia de este formulario para tus archivos.

Atentamente,

Stephania Uwakweh

---

Stephania Uwakweh ha respondido todas mis preguntas.

Estoy de acuerdo en participar por mi propia voluntad.

No estoy de acuerdo en participar por mi propia voluntad.

Firma del participante :\_\_\_\_\_

Firma de la investigadora:\_\_\_\_\_

## **Appendix B : Solicitud de Consentimiento Informado**

Universidad de Puerto Rico  
Recinto Universitario de Mayagüez  
Colegio de Artes y Ciencias  
Departamento de Inglés

### **SOLICITUD DE CONSENTIMIENTO INFORMADO**

Estimado padre, Madre o tutor:

Mi nombre es Stephania Uwakweh y soy estudiante del Recinto Universitario de Mayagüez de la Universidad de Puerto Rico. Estoy completando una maestría en Educación de Inglés (MAEE). Para mi tesis de maestría, que estoy en el proceso de escribir, estoy interesada en diseñar una unidad didáctica multidisciplinaria para estudiantes de octavo grado que integre la educación ambiental al currículo de inglés.

Para lograr este objetivo, tengo que hacerles a los estudiantes de octavo grado una serie de preguntas por medio de un cuestionario. Humildemente solicito su permiso para que su hijo conteste mi cuestionario. El resultado de la encuesta determinaría la idea central de mi tesis de maestría. Siendo madre yo misma, considero mi solemne responsabilidad el asegurar que la identidad de su hijo no se revele en ningún momento a lo largo de este proceso. Los datos que se recojan se guardarán bajo llave en un archivo.

El Departamento de Educación no será responsable del proceso ni del resultado del siguiente proyecto de investigación. Yo, como profesora, tomo la responsabilidad absoluta del resultado del mismo. La participación de su hijo es completamente voluntaria y le tomará más o menos 30 minutos el completar la encuesta. Su hijo tiene la libertad de negarse a completar el cuestionario y también de cambiar de opinión, incluso después de la aceptación inicial de participar, sin penalidad alguna. Participar en la encuesta no representa ningún riesgo significativo para su hijo.

Si usted me concede la autorización para que su hijo pueda completar un cuestionario para mí, por favor, firme este formulario. Mi número de teléfono es el (787) 420-6523. Por favor, no dude en ponerse en contacto conmigo por cualquier pregunta que pueda tener acerca de esta actividad y si desea conocer los resultados del estudio.

Atentamente,

Stephania Uwakweh

Por la presente autorizo a Stephania Uwakweh, del Recinto Universitario de Mayagüez de la Universidad de Puerto Rico, a invitar a mi hijo a completar un cuestionario con fines educativos o de investigación. Puede usar a su discreción información global de mi barrio o de mi niño en actividades académicas relacionadas con las presentaciones y escritos.

Firma del parent o de la madre: \_\_\_\_\_

Dirección: \_\_\_\_\_  
Ciudad/Estado/Código Postal: \_\_\_\_\_

Fecha: \_\_\_\_\_

## **Appendix C: Questionnaire (English)**

### **GREEN ENGLISH: AN INTERDISCIPLINARY APPROACH TO ECO-CONSCIENTIZATION**

Purpose of Study: This study seeks to design an instructional unit that incorporates environmental literacy topics in the English as a Second Language curriculum (ESL). The findings from this survey will help determine the thrust of the instructional unit design.

Title: Green English: An Interdisciplinary Approach to Eco-Conscientization

Investigator: Stephania Uwakweh

Target Group: 8<sup>th</sup> grade students at a middle school in Mayaguez, Puerto Rico

Age: \_\_\_\_\_ Gender: \_\_\_\_\_ Date: \_\_\_\_\_

#### **PART I- ENVIRONMENTAL KNOWLEDGE**

##### **1) Mention four causes of environmental pollution?**

- a)\_\_\_\_\_
- b)\_\_\_\_\_
- c)\_\_\_\_\_
- d)\_\_\_\_\_

##### **2) Mention four ways we can conserve (avoid wasting) energy?**

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##### **3) Mention three effects of global warming?**

- a)\_\_\_\_\_
- b)\_\_\_\_\_
- c)\_\_\_\_\_

##### **4) Animals are not as important as human beings, therefore they should not have rights.**

- a) Strongly agree
- b) Agree
- c) Undecided
- d) Disagree
- e) Strongly disagree

**5) There is no such thing as ‘environmental crisis’ because nature is tough enough to withstand any negative threat or abuse.**

- a) Strongly agree
- b) Agree
- c) Undecided
- d) Disagree
- e) Strongly disagree

## **Part II- ATTITUDE**

**6) Do you enjoy activities that involve drawing, painting and writing creatively about nature-related topics?**

- a) Always
- b) Often
- c) Sometimes
- d) Rarely
- e) Never

**7) Reading literature books and stories that focus on planting, such as *Seed folks* (Leona) in the English class, would improve your understanding of the different aspects of planting.**

- a) Strongly agree
- b) Agree
- c) Undecided
- d) Disagree
- e) Strongly disagree

**8) Outdoor education inspires environmental responsibility in students.**

- a) Strongly agree
- b) Agree
- c) Undecided
- d) Disagree
- e) Strongly disagree

**9) Advertising creates artificial needs to make you buy things that you do not need.**

- a) Strongly agree
- b) Agree
- c) Undecided
- d) Disagree
- e) Strongly disagree

**10) I recycle my plastic, aluminum cans, paper and glass.**

- a) Always
- b) Often
- c) Sometimes
- d) Rarely
- e) Never

**11) We dry our clothes outside or on cloth racks inside the house.**

- a) Always
- b) Often
- c) Sometimes
- d) Rarely
- e) Never

### **PART III- BEHAVIOR**

**12) How much time do you spend outdoors on a typical day?**

- a) Less than one hour
- b) One to two hours
- c) Two to three hours
- d) Four or more hours

**13) I save my vegetable and fruit waste as compost.**

- a) Always
- b) Often
- c) Sometimes
- d) Rarely
- e) Never

**14) I participate in gardening-related activities.**

- a) Always
- b) Often
- c) Sometimes
- d) Rarely
- e) Never

**15) I turn off the lights, television, laptop, computer, and other electricity-powered electronics when they are not in use.**

- a) Always
- b) Often

- c) Sometimes
- d) Rarely
- e) Never

## **Appendix D: Questionnaire (Spanish)**

### **INGLÉS VERDE: UN ENFOQUE INTERDISCIPLINARIO PARA LA ECO-CONCIENTIZACIÓN**

**Propósito del estudio:** Este estudio trata de diseñar una unidad didáctica que incorpora temas del medio ambiente al currículo de Inglés como Segundo Idioma (ESL). Los resultados de este estudio ayudarán a determinar la confianza de la unidad de diseño instruccional.

**Título: Inglés Verde:** Un Enfoque Interdisciplinario para la Eco-concientización

**Investigadora:** Stephania Uwakweh

**Grupo destinatario:** Estudiantes de octavo grado en la Escuela Acreditada en Mayagüez, Puerto Rico

**Edad:** \_\_\_\_\_ **Sexo:** \_\_\_\_\_ **Fecha:** \_\_\_\_\_

#### **PARTE I-CONOCIMIENTO DEL MEDIO AMBIENTE**

**1) Menciona cuatro ejemplos de situaciones que han causado la contaminación del medio ambiente.**

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_

**2) Menciona cuatro soluciones que podamos utilizar para conservar la energía (evitar el desperdicio de la misma).**

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_

**3) Menciona tres efectos del calentamiento global.**

- a) \_\_\_\_\_

b) \_\_\_\_\_

c) \_\_\_\_\_

**4) Los animales no son tan importantes como los seres humanos, por lo que no deberían tener derechos.**

- a) Totalmente de acuerdo
- b) De acuerdo
- c) Indeciso
- d) En desacuerdo
- e) Totalmente en desacuerdo

**5) No existe tal cosa como la "crisis ambiental" porque la naturaleza es suficientemente fuerte como para resistir cualquier amenaza negativa o abuso.**

- a) Totalmente de acuerdo
- b) De acuerdo
- c) Indeciso
- d) En desacuerdo
- e) Totalmente en desacuerdo

## **Parte II-ACTITUD**

**6) ¿Está usted participando y disfrutado de actividades que envuelvan dibujo, pintura o escritura creativa sobre temas relacionados con la naturaleza?**

- a) Siempre
- b) A menudo
- c) A veces
- d) Rara vez
- e) Nunca

**7) La lectura de libros de literatura e historia en la clase de inglés, que se enfoquen en el tema de la siembra, como la *Gente de Semillas* (Leona); mejoraría su comprensión de los diferentes aspectos de la siembra.**

- a) Totalmente de acuerdo
- b) De acuerdo
- c) Indeciso
- d) En desacuerdo
- e) Totalmente en desacuerdo

**8) La educación al aire libre inspira la responsabilidad ambiental en los estudiantes.**

- a) Totalmente de acuerdo
- b) De acuerdo

- c) Indeciso
- d) En desacuerdo
- e) Totalmente en desacuerdo

**9) La publicidad crea necesidades artificiales para hacerte comprar cosas que no necesitas.**

- a) Totalmente de acuerdo
- b) De acuerdo
- c) Indeciso
- d) En desacuerdo
- e) Totalmente en desacuerdo

**10) Yo reciclo el plástico, latas de aluminio, papel y vidrio.**

- a) Siempre
- b) A menudo
- c) A veces
- d) Rara vez
- e) Nunca

**11) Secamos la ropa al aire libre o utilizamos ganchos plásticos y cordeles dentro de la casa.**

- a) Siempre
- b) A menudo
- c) A veces
- d) Rara vez
- e) Nunca

### **PARTE III-COMPORTAMIENTO**

**12) ¿Cuánto tiempo pasas “al aire libre” durante fines de semana, feriados y/o días que no vas a la escuela?**

- a) Menos de una hora
- b) Una a dos horas
- c) Dos a tres horas
- d) Cuatro horas o más

**13) Yo guardo los desperdicios de verduras y frutas como abono fertilizante.**

- a) Siempre
- b) A menudo
- c) A veces
- d) Rara vez
- e) Nunca

**14) Yo participo en actividades relacionadas con la jardinería.**

- a) Siempre
- b) A menudo
- c) A veces
- d) Rara vez
- e) Nunca

**15) Yo apago las luces, la televisión, las computadoras de escritorio, las computadoras portátiles y otros aparatos electrónicos cuando no están en uso.**

- a) Siempre
- b) A menudo
- c) A veces
- d) Rara vez
- e) Nunca