Reduce, Reuse, Reeducate: Sustainability Through Learning

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May 8, 2010
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Description of Teaching Context

Working as a Professional Development School Intern through Penn State University, I am student teaching in a sixth grade classroom at Mount Nittany Middle School for the 2009-2010 school year. Located in State College Area School District, Mount Nittany benefits from the affluent district’s resources such as laptops for every student and well-maintained facilities. The middle school’s administrators and staff possess receptive, flexible attitudes and are pleased to accommodate innovative student initiatives. In addition, classes in the sixth grade hallway are neighborly and collaborative due to student friendships and teacher teamwork.

My classroom, self-contained during all academic periods except mathematics, consists of 24 students. The majority of my students come from middle class, two-parent families. Given this general economic stability, many of my students have traveled across or out of the country, which provides my classroom with diverse cultural and historical perspectives.

A welcoming and open sense of community creates a friendly, collaborative, enthusiastic atmosphere in my classroom. Learning occurs in large part through discussions and activities. While most of the curriculum used in my classroom can be stretched or altered to involve environmental or sustainability topics, the Passports unit of social studies, which we will be using for the remainder of the year, relates directly to concepts of sustainability. This expansive unit concentrates on the diversity of our world, the positive and negative attributes of that diversity, and global interdependence. The smaller topics discussed in each lesson help students understand human impacts on the earth, the economy, and each other. In addition to the relevance of social studies in my inquiry, five of my students are receiving learning enrichment services and have the opportunity to participate in lessons tailored to sustainability topics by the enrichment teacher.
Wonderings

Main Wondering

After completing a general education course in college that transformed my awareness of environmental and social issues, I entered my student teaching internship aspiring to help my students understand the vital importance of building a sustainable world. The United Nations’ Brundtland Commission defines sustainability as, “meeting the needs of the present without compromising the ability of future generations to meet their own needs.” Our lifestyles’ demands on the earth’s natural resources cannot be upheld forever, and my students’ generation may be responsible for finding the desperately needed solutions to issues such as deforestation, toxic pollution, uncontrolled population growth, and exploitation of natural resources. During October of 2009 I began talking with my students about these issues during informal times such as recess, causing one student to display enthusiasm and determination to create sustainable habits in our school. As interest spread within my classroom, I began to consider how this interest could be harnessed in a formal manner. Reading and technology literacies are heavily emphasized in the school setting; why not insist on a sustainability literacy as well? I combined this thought with knowledge of my students’ desires to actively improve our environmental situation to form my main inquiry wondering: How can I generate sustainability literacy and activism among my students?

Sub-Wonderings

• What interventions can I use in my classroom to help my students acquire the knowledge and perspectives related to achieving sustainability in our community?
• What interventions can I use in my classroom to help my students apply the knowledge and perspectives related to achieving sustainability in our community?
• How can I implement my interventions within required curriculum?
• How can I implement my interventions outside of required curriculum?
Data Collection

Before collecting data for my inquiry, I first needed to establish my personal definitions of sustainability literacy and activism. These definitions would shape my inquiry goals and the various interventions I would attempt with my students. I defined sustainability literacy according to “The Environmental Literacy Ladder” created by the Campaign for Environmental Literacy: a sustainability literate student possesses “knowledge and understanding of human and natural systems” and maintains “attitudes of appreciation and concern for the environment.” I described sustainability literacy, meanwhile, as intentional behavior which aims to improve the state of a local or global environment. After researching sustainability education and comparing other educators’ efforts to my possibilities at Mount Nittany Middle School, I designed and named four interventions I believed could create sustainability literacy and activism among my students: student engagement in projects related to the environment (Service Learning); lessons about sustainability that correlated to national curriculum requirements (Direct Instruction); learning enrichment classes based on sustainability (Learning Enrichment); and the integration of sustainability ideas into the existing sixth grade curriculum (Curriculum Integration). During my inquiry process I would implement these interventions, collect diverse data relevant to each, and analyze the data to determine the interventions’ impact on my students. In order to gain a comprehensive understanding of my students’ existing and evolving sustainability literacy and activism, and thus the effectiveness of my interventions, I performed a total of four types of data collection previous to, during, and after my four main interventions.

Data Collected Before Interventions

Prior to implementing any interventions, I composed and conducted two written student surveys which aimed to assess my students’ current knowledge on environmental issues, their
definitions of sustainability, and their beliefs about sustainability activism. These surveys contained four questions each and were given to my entire class on February 3 and February 15, 2010. *(See Appendix B for Student Survey #1 and Student Survey #2)*

**Data Collected During Interventions**

I collected the majority of my data as I implemented my interventions, with each source of data aiming to gauge student progress, habits, thoughts, and adjustments as my interventions continued.

**INTERVIEWS**

Two weeks after formally beginning my interventions, I created a focus group of three students who I could closely monitor for characteristics of evolving sustainability literacy and activism. I chose these students based on my perception of their existing sustainability knowledge and passion. B.F. was chosen for her intellectual knowledge and participation in the Learning Enrichment interventions, B.C. was chosen for his enthusiasm about sustainability activism, and T.F. was chosen to represent students who appeared indifferent to sustainability ideas. To thoroughly how the thoughts and attitudes of these students may have evolved due to my early interventions, I interviewed them individually on February 23, 2010. I asked questions pertaining to the students’ understanding of sustainability and their personal contributions to sustainable or unsustainable lifestyles. *(See Appendix C for Focus Group Interview #1)*

**FIELD NOTES**

During February and March of 2010 I recorded informal notes, thoughts, and reflections on my sustainability-related classroom occurrences. I documented these thoughts using my online blog in order to capture student quotes, class activities, thoughts on lessons and initiatives, and exciting student ideas. I categorized these notes based on the intervention with which the
data correlated; thus, my blog displays field notes from Learning Enrichment, Direct Instruction, Curriculum Integration, and Service Learning interventions. I also collected a Miscellaneous category filled with student quotes and activities that occurred strictly due to student desire and not in direct correlation to an intervention.

### STUDENT WORK

When teaching Direct Instruction and Curriculum Integration lessons, I saved student work that corresponded with the lessons and displayed genuine student attitudes and knowledge regarding sustainability. Class and homework assignments included individual writing prompts, group writing activities, and the creation of unique projects to convey notions of sustainability. Unexpectedly, I also found myself collecting student work about sustainability that was unprompted or within another academic subject, such as comments about the environment in spelling sentences and reading journals. I copied or kept each of these pieces of student work to track possible student increase in sustainability literacy. *(See Appendix E for Student Work)*

### Data Collected After Interventions

In order to gauge my students’ full sustainability literacy and activism growth at the completion of my interventions, I gave my class a survey consisting of four questions similar to those in the first survey. The survey questions revolved around the meaning of sustainability, the world’s main environmental problems, and unsustainable lifestyle habits. I also asked one learning enrichment student to explain her experiences in the Learning Enrichment Integration intervention *(See Appendix F for Student Survey #3)*

I also interviewed my three focus group students in order to hear their thoughts on the value of my efforts and to gauge their perceptions of personal sustainability growth. I asked
open-ended questions that allowed students to answer using individual knowledge, passions, or interests. *(See Appendix G for Focus Group Interview #2)*

**Data Analysis**

Armed with a surplus of data, I began the data analysis process by systematically organizing my four types of information. I arranged my data in a variety of ways to determine if my interventions succeeded and thus answered my main wondering: *How can I generate sustainability literacy and activism among my students?* I hoped that comparing and observing data would show me if my chosen interventions were the best choices to address my wondering. In order to consistently gauge literacy growth as I analyzed my data, I utilized the definitions of sustainability literacy and activism that I introduced on page five of this report.

To begin, I created a table to compare the results of my students’ first, second, and third surveys. These results tested sustainability literacy growth only, as each question asked for student attitudes and knowledge regarding issues and solutions. My incorporation of similar questions in each survey allowed me to directly track students’ sustainability literacy by recording and then comparing individual answers on survey one, two, and three. I chose to first concentrate on the question, “What environment issues do you wish would be changed or fixed?” After compiling student answers, I highlighted in yellow any students who showed, through increased insight or content in responses, a significant expansion in awareness and knowledge from the first to third survey. Next, I used gray highlight to denote students whose responses maintained the same lengths but differed in content. Students who actually decreased answer length or content received a blue highlight. I also chose to focus on the question, “How do you define sustainability?” To compare the results of this question I counted the number of students
who answered “I don’t know”, offered an incorrect answer, or provided a correct answer in the first and third surveys. (See Appendix H for Survey Answers)

Next, I compiled my Miscellaneous field notes and separated my records into categories of Student Comments and Student Actions. After skimming and reflecting on the field notes, I developed seven outcomes that best indicated my students’ acquired behavior since the beginning of my interventions, as seen in my analysis chart. I color-coded my field notes to ascertain the numerical occurrences of each outcome in the two months I conducted interventions. The frequently recurring outcomes helped me identify the prevalent effects of my interventions. (See Appendix I for Field Notes Analysis)

In order to analyze my Learning Enrichment, Direct Instruction, Curriculum Integration, and Service Learning field notes, I searched for patterns that would identify the main impact of each intervention. I found two or three main motifs within each intervention; these can be cross-referenced with other sources of data for validity. (See Appendix I for Field Notes Analysis)

Similar to my methods for analyzing field notes, I examined my focus group interviews using tables as a means to identify patterns. Through observing patterns I sought to find similarities in student answers and to discern comparisons between the first and last interviews. Answer uniformity would allow me to identify the strongest impacts of my interventions, while comparisons would identify student growth. (See Appendix J for Interview Patterns)

My last source of data, student work, provided the most insight into which academic facts and ideas I helped my students gain through the course of my inquiry. Since each piece of student work dealt with a certain sustainability idea, I analyzed this data by creating a list of facts and perspectives my students demonstrated within the assignments. This checklist allowed me to
identify, particularly cross-referenced with interviews and surveys, the genuine level of sustainability literacy I helped my students acquire. *(See Appendix K for Student Work Patterns)*

**Explanation of Findings**

After meticulously analyzing my data using the methods described above, I identified patterns and outcomes that allowed me to construct three claims regarding how to generate sustainability literacy and activism among students. These claims simultaneously address my main and sub wonderings by discussing what interventions, both within and outside of my school’s curriculum, helped my students acquire and apply the knowledge and perspectives necessary to achieving sustainability literacy and activism.

**Claim One: When Direct Instruction and Curriculum Integration interventions are utilized concurrently, students demonstrate increased sustainability literacy by contemplating diverse environmental problems and solutions and revealing passionate attitudes towards the environment.**

My multiple data analyses illustrate my students’ general lack of common sustainability literacy before the execution of my Direct Instruction and Curriculum Integration interventions. “Knowledge and understanding of human and natural systems,” the first characteristic of a sustainability literate person, eluded my students. This pattern appears in student answers to my first pre-intervention survey, as 89% of my students- 16 of the 18 polled- identified only one or two environmental problems that they felt needed to be addressed. Of these answers, 62% stated that deforestation, pollution, littering, or lack of recycling needed to change; such limited answers do not demonstrate a genuine understanding of the human and natural systems that hinder or create a sustainable environment. Likewise, only three of the 18 students correctly
defined sustainability in the first pre-intervention survey, while six students answered incorrectly and ten students answered, “I don’t know.”

Similarly, “attitudes of appreciation and concern for the environment,” the second aspect of a sustainably literate person, was not prevalent within my class. Students consistently placed recyclables in the trash and wasted clean pieces of paper, acts which show no concern for natural resource waste or appreciation of natural surroundings. In addition, environmental topics rarely arose in conversation and students never exclaimed disgust with our current environment situation, as many would during and after my intervention process.

To address my students’ limited awareness of environmental issues, I taught lessons about global issues, the definition of sustainability, and environmental problems and solutions. I also incorporated lessons of sustainability during discussions of current events, social studies lessons, and writing assignments. In the surveys taken after these interventions, students answered the same question, “What environmental issues do you wish would be fixed or changed?” with a drastic increase in content-based responses. Of the 15 students polled, 12 offered at least three sustainability issues that should be resolved. On average, students indicated five deserving of attention, with some students offering up to 11 and 13 ideas. Responses included sophisticated topics we discussed in class such as ecological footprints, destructive mindsets, lack of awareness on issues, consumerism, and oil dependency. Similarly, 12 students could correctly define sustainability in the post-intervention survey- a 50% increase from the pre-intervention survey.

Students also demonstrated their growing sustainability literacy in other pieces of work, such as an extra credit question in a social studies quiz that asked, “How can you produce less plastic garbage?” My students brainstormed a total of 13 different solutions to the problem of
excess waste. Furthermore, in a Direct Instruction lesson at the very end of my intervention cycle, my students worked as a group, without my help, to brainstorm 28 various problems that contribute to our unsustainable societal habits. Examples of these obstacles include loss of biodiversity, lack of awareness, separation of cultures and beliefs, consumerism, overpopulation, loss of natural habitats, and technology abuse. My students also suggested 28 intricate solutions to the above problems, including decomposable products, equally distributed resources, healthy consumption, less packaging, controlled waste, and open-mindedness.

Evidence for this claim is also apparent in my focus group’s post-intervention interview responses. As student T.F. explained during his interview, “I’ve definitely learned how much more we are affecting the earth. [Your lessons showed me] how much a little thing can make a difference. I learned the cycles [of consumerism and production], which I never would have had a clue about before.” Similarly, B.F. states, “I had learned about [interdependence] in science last year, but I had never thought about it with the human race [before your lessons].” B.C. echoes these claims by telling me, “I learned about how many things are thrown away and wasted and how we take up one third of the whole world’s natural resources.”

My students’ growing sustainability knowledge helped them become advocates of the environment, leading them to demonstrate attitudes of appreciation and concern for the environment. As my field notes analysis shows, numerous students made comments or performed actions that I categorized under the topics of spreading information and enthusiasm to others, changing behavior to become more sustainable, making observations about local or global sustainability situations, and feeling proud of personal sustainability. The number of students performing within these categories grew from February to March as my interventions continued to impact my classroom. For example, one student commented, “Miss K.! Ugh! Why
isn’t anyone using solar energy?” after reading that the energy the sun radiates in one day could supply our country’s energy needs for one year. Other students made comments such as, “I reused and reduced! My shorts used to be jeans,” and ,“Miss K., I saw a story on the news about uniforms at schools in Oregon being biodegradable and I just thought that was like... whoa! So cool.” Other students remarked, “Old Navy sells these bags with silver earths and I hope they encourage people to use less plastic. I was really happy to see them,” and, “Did somebody use all of those paper towels!?” These quotes represent the myriad other comments made by my students which indicate genuine concern and appreciation for the environment.

Based on this information, I observed a clear difference in my students’ positive environmental attitudes and knowledge of assorted human and natural systems. This growth points directly to an increase in sustainability literacy. I attribute this to Curriculum Integration and Direct Instruction interventions, as students received the most specific, content-based information in those lessons.

Claim Two: When provided with supported opportunities to participate in service learning projects related to school-based environmental habits, students increase sustainability activism by acquiring the motivation and skills necessary for cultivating school-wide sustainability practices.

The second half of my inquiry wondering, which seeks to uncover the most powerful ways to encourage sustainability activism among students, was answered as I observed a drastic difference in student behavior before and after service learning became an integral part of my classroom dynamic. At the beginning of the school year only a small group of students possessed concern for environmental issues; ideas of recycling, composting, reducing waste, and reusing materials-notions which developed during my inquiry process- were never mentioned within my
classroom. Similarly, students only worked in groups when required for an academic reason; voluntary collaboration to reach a shared goal never occurred. Through the course of my inquiry, however, my students and I initiated three types of widespread service learning projects: collecting abandoned paper from trashcans, recycling bins, and printers to be reused or recycled; buying, laminating, advertising, and posting stickers that proclaimed, “These Come From Trees!” on paper dispensers around the school; and collecting bottle caps from plastic bottles to be recycled by the company Aveda. I consistently vocalized my support of these projects during formal and informal classroom times. I also ensured that these opportunities were offered equally to each of my students.

In February, a group of six students forfeited recess on a regular basis to work on the sticker project. When I offered my class the opportunity to spend a work period in the bathroom counting how many paper towels are used in an hour, ten out of 24 students volunteered. As new-found desire for activism circulated my classroom, service learning efforts increased. In March, up to 12 students traded recess for working on the sticker project. Students also began to voluntarily collaborate on a variety of projects: writing morning announcements about the stickers; recoding a video on paper waste to be played on the morning announcements; building bottle cap collection sites; gathering bottle caps from collection areas; offering paper binders to other classrooms; making announcements at lunches about recycling bottle caps; and encouraging friends from other classes to recycle paper and bottle caps. We even created an assignment sheet to ensure at least two students were responsible for collecting bottle caps everyday. A total of 13 out of 24 students volunteered for this job. As my claim states and my Miscellaneous field notes prove, service learning helped my students develop the skills and motivation to create and enforce environmentally conscious behaviors in a school setting.
Claim Three: By participating in sustainability-oriented learning enrichment classes, students strengthen their abilities to utilize creativity and problem-solving skills in order to address sustainability issues.

While working to create a sustainability related curriculum for my learning enrichment students, the learning enrichment teacher and I gave students the power to determine their learning experiences. By molding the second enrichment lesson around the question, “How do the big ideas of sustainability relate to our local community?” we provided students with an unexpected opportunity to create and share ideas for making our school a more sustainable building. As my field notes show, the students brainstormed 32 projects within a 30 minute period. Due to the freedom granted in Mount Nittany’s learning enrichment program, the students were granted permission to pursue individual or group projects that aimed to create sustainability in our school. During the two months that this learning enrichment intervention was implemented, students used their time to research, collaborate on, and implement project ideas. As B.F. stated in her post-intervention interview, “It enhanced my creativity. Honestly, I just think learning enrichment is good with creativity and thinking of HOW we can solve [sustainability problems] and enhance our horizons.” Similarly, E.C. explained, “The Learning Enrichment classes have helped me tremendously because I have learned how to put my ideas to the test.... I have also learned how to work with a group to combine everyone’s ideas, picking out the things that would probably not work, making an even better project than I started with.”

As my field notes indicate, learning enrichment allowed students to develop thought-provoking, creative, solution-based school projects: selling homemade earth-friendly products as a fundraiser; creating informational videos to help all Mount Nittany Middle School students understand what to recycle, compost, and reuse; building an origami swan out of wasted paper to
display in the front lobby; creating “Sustainability Challenges” for the 6th grade; performing a play to inform others about sustainability and encourage them to contribute; and building a composting area for paper towels. The Learning Enrichment intervention provided students with an open, supportive, and challenging arena to address sustainability issues.

**Reflections and Future Practice**

This inquiry process has revealed to me the powerful possibilities of sustainability education for students, educators, classroom communities, and school environments. Based on my own recollections and the surplus of collected data shown through this paper, I can distinctly identify the drastically different awareness, knowledge, and concerns of my students currently in comparison with the beginning of the school year. Not a day has passed since January in which multiple students have not mentioned something related to the environment or contributed to one of our ongoing activism projects. Based on my claims, I believe that my inquiry efforts successfully created such an impassioned classroom and thus answered my main and sub wonderings.

When reflecting on my time preparing for, implementing, and analyzing my inquiry, I chiefly remember the sheer excitement and passion for the environment that my students unexpectedly demonstrated. Though I hoped to impact my students in some way through my interventions, I never predicted they would begin mentioning sustainability ideas in math class or to their parents. It astounds me to think that a deep passion of mine truly can be integrated into any school setting. I had no time to use outdoor space and resources, nor did I have an official curriculum or a team of teachers working toward my goal. I discovered my claims and witnessed
the power of sustainability education using only the tools at my advantage, which assures me that I can do the same in my future classrooms.

My inquiry research, interventions, and achievements have revolutionized my future plans as an educator. After witnessing the extraordinary classroom changes possible when implementing sustainability education, I aim to work in a school district that will grant me the freedom to continue such undertakings with my next group of students. I specifically want to explore the possibilities of sustainability education when implementation can begin on the first day of school. How could the classroom environment be utilized to maximize sustainability learning, student participation in service learning, and growth of class enthusiasm? How could I employ a school’s grounds or surroundings to cultivate ecological awareness? Could fieldtrips to local sites of sustainability be organized? Might an involved administrator advance my efforts or help spread ideas to other teachers? If my colleagues are willing to collaborate with me to create sustainability education, how powerfully could I impact students? How would I adopt my ideas in a primary classroom, where the developmental abilities of students differs drastically? What other environmental and sustainability ideas can I explore and teach? I will continue to ask these questions throughout my career as I aim to expand my ability to achieve sustainability education.
APPENDIX A: INQUIRY BRIEF

Context:
Working as a Professional Development School Intern through Penn State University, I am student teaching in a sixth grade classroom at Mount Nittany Middle School for the 2009-2010 school year. My classroom, self-contained during all academic periods except mathematics, contains 24 students. Of these 24 students, 12 are female and 12 are male. Two of these female students are English Language Learners (ELL) from South Korea who, though able to communicate effectively, have yet to learn environmental or sustainability specific vocabulary.

Five of my students participate in enrichment services in language arts, while two receive Learning Support and one receives Title I services. The majority of my students come from middle class families with two parents and siblings. Given this general economic stability, a great deal of my students have traveled across or out of the country, which may provide diverse cultural and historical perspectives in my classroom. A welcoming and open sense of community creates a friendly, collaborative, enthusiastic atmosphere in my classroom. Learning occurs in large part through discussions and activities.

While most of the curriculum used in my classroom can be stretched or altered to also involve environmental or sustainability topics, the Passports unit of social studies, which we will be using for the remainder of the year, relates directly to concepts of sustainability. This expansive unit concentrates on the diversity of our world, the positive and negative attributes of that diversity, and the interdependence of all the world. The smaller topics discussed in each lesson help students understand human impacts on the earth, the economy, and each other. This unit lends itself ideally to my inquiry topic.

In addition to the relevance of social studies in my inquiry, five of my students also have the opportunity to participate in sustainability related learning enrichment twice a week. These
five students will learn in depth about sustainability topics by researching local sustainability initiatives, implementing sustainability projects within our school, and investigating sustainability in other cultures.

**Rationale:**

A student in my classroom, Elizabeth*, inspired my inquiry when she informed me of a sticker she once saw posted on a paper towel dispenser that requested, “Please remember, these come from trees! Every sticker saves 1,000 pounds of paper.” Elizabeth expressed her desire for our middle school to use these stickers as an endeavor to decrease the rampant paper waste typical in a school setting. I have always housed a passion for environmental awareness and activism, so I immediately told Elizabeth I would love to work with her to find the producer of the stickers and bring them to our school. Our “sticker initiative” proved a catalyst for uncovering the environmental advocates in my students; we ordered 230 stickers and became highly sensitive about the paper use in our classroom. After noticing the outrageous amounts of paper thrown away every day, Elizabeth suggested we collect unclaimed paper from the printer and reuse it in place of notebook paper. Before long, we had collected so much used paper that we needed one, then two, then four binders to contain the paper we could no longer fit in my large desk drawers. When my social studies methods course instructors assigned the creation of a Public Service Announcement on an issue of our choosing, I selected paper waste as my topic. My students played a vital role in the making of the PSA, which I believe allowed my students to take ownership of a fundamental environmental issue. From that day on, many of my students became champions for environmental health. In their enthusiasm I recognized an opportunity to overlap my passions of education and sustainability, so I began having informal discussions with
my students about different environmental topics. I aimed only to make them more aware of the issues I deeply care about.

However, as PDS introduced the inquiry process I realized I could harness my students’ natural passion for environmental health in order to do more than informally talk about issues vital to the well-being and future of our world. I examined my true goal and deduced that, above all, I want my students to leave my classroom with awareness of world issues, appreciation of global obstacles, and the skills necessary to becoming an active, responsible, and informed member of society. Ultimately, my objective became to discover methods to help my students become literate and active in the realm of sustainability.

Just as students are required to achieve and apply reading and writing literacies in school, literacy in and application of sustainability are also possible. Though a host of strategies have been developed in efforts to combine education and sustainability, the United Nations selected *Education for Sustainable Development* (ESD) as the leading initiative; thus, I have chosen ESD as the intervention around which I will base my inquiry interventions. To explain why I believe my inquiry question is worthy of exploration, I will offer the definition of ESD as derived by the United Nations: “ESD equally addresses all three pillars of sustainable development—society, environment, and economy—with culture as an essential additional and underlying dimension. By embracing these elements in a holistic and integrated manner, ESD enables all individuals to fully develop the knowledge, perspective, values and skills necessary to take part in decisions to improve the quality of life both locally and globally on terms which are most relevant to their daily lives.” The United Nations reflects that ESD aims to help students, “make decisions that consider the long-term future of the economy, ecology and equity of all communities. Building the capacity for such futures-oriented thinking is key task of education…. [This is] a vision that
helps students [address] the complexity and interconnectedness of problems such as poverty, wasteful consumption, environmental degradation, urban decay, population growth, health, conflict and the violation of human rights that threaten our future.” Essentially, I believe an incorporation of Education for Sustainable Development in my classroom is worth pursuing for the three benefits it will provide to my students; ESD will help my students understand the interrelation of the many facets of our world, assist them in becoming responsible and aware democratic citizens, and provide them with crucial and applicable problem solving abilities.

I believe I will discover both powerful and fruitless techniques for incorporating ESD in my classroom. Above all, I suspect that finding time to incorporate the necessities of ESD will prove my largest challenge. Given that this is a main problem for teachers when attempting to implement something novel or removed from state curriculum, I hope to find realistic and pertinent solutions to this persisting difficulty. I also sense that, while many of my students will show growth in their sustainability literacy over the next few months, my tactics will not impact every child in my classroom. These unaffected students may serve as proof that, while my measures may have been successful, more implementation was needed.

Main Wondering: How can I generate sustainability literacy and activism among my students?

Sub-Questions:
1. How can the known model of Education for Sustainable Development serve as a foundation for my inquiry research?
2. What interventions can I use in my classroom to help my students acquire the knowledge, skills and perspectives related to achieving sustainability in our world?
3. What interventions can I use in my classroom to help my students apply the knowledge, skills, and perspectives related to achieving sustainability in our world?
4. What strategies can I use to implement my chosen interventions?
5. How can I implement my interventions within required curriculum?
6. How can I implement my interventions outside of required curriculum?
### Timeline:

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<th>WEEK OF:</th>
<th>ACTIVITY:</th>
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| February 8    | 1. Collect base line data to determine students’ prior attitudes and knowledge of subject matter.  
                | 2. Continue to conduct background research.  
                | 3. Collect data (Field Notes, pictures, student comments) about service learning already in action.  
                | 4. Continue working with Learning Enrichment (LE) leader Debra Daggs to solidify plans for LE becoming 1 of 4 interventions (sub-question 2/3).  
                | 5. Review curricular material to find places of overlap between subjects and inquiry topic.  |
| February 15   | 1. Revise Rationale and Bibliography.  
                | 2. Work with students Monday and Tuesday afternoon on two different interventions being tested (TBA); collect appropriate data.  
                | 3. Begin Enrichment ESD program and collect appropriate data.  
                | 4. Continue working with Debra Daggs to solidify future LE plans.  
                | 5. Continue to review curricular material to find places of overlap between subjects and inquiry topic.  
                | 6. When possible, implement curricular integrations and collect appropriate data.  
                | 7. Continue to collect data about service learning already occurring.  |
| February 22   | 1. Continue LE integrations and collect appropriate data.  
                | 2. Continue to implement curricular integration and collect appropriate data.  
                | 3. Continue to collect data about service learning already occurring.  
                | 4. Spend Monday 8th period on Service Learning and collect appropriate data.  
                | 5. Interview Focus Group (INTERVIEW ONE)  |
| March 1       | 1. Continue Enrichment integrations and collect appropriate data.  
                | 2. Continue to implement curricular integration and collect appropriate data.  
                | 3. Continue to collect data about service learning already occurring.  
                | 4. Use one period in the week to concentrate on a Cross-Curricular strategy with students.  
                | 5. Implement further service learning whenever time is allotted.  |
| March 8       | SPRING BREAK  
                | 1. Scan data to mark progress.  
                | 2. Plan for the events taking place during the week of March 15th.  |
| March 15      | 1. Continue Enrichment integrations and collect appropriate data.  
                | 2. Continue to implement curricular integration and collect appropriate data.  
                | 3. Continue to collect data about service learning already occurring.  
                | 4. Use one period in the week to concentrate on a Cross-Curricular strategy with students.  
                | 5. Continue further service learning whenever time is allotted.  
                | 5. Begin to analyze data.  |
| March 22      | 1. Use one period in the week to concentrate on a Cross-Curricular strategy with students.  
                | 2. Continue Enrichment integrations and collect appropriate data.  
                | 3. Continue to implement curricular integration and collect appropriate data.  
                | 4. Continue to collect data about service learning already occurring.  |
Data Collection Ideas:

I plan to gather data by employing seven data collection techniques in order to answer the question, “Are my chosen interventions effectively creating sustainability literacy and activism among my students?” I will implement these collection techniques when executing four interventions and in relation to these interventions, each meant to generate sustainability literacy and activism among my students in a different manner. Learning Enrichment integration, Curriculum Integration, Cross-Curricular Integration, and Service Learning constitute my four interventions, while the seven collection techniques include qualitative performances, whole-class surveys, videotapes, field notes supplemented by photographs, student work or artifacts, reflections made in my personal Weblog, and interviews with my focus group. In the following paragraphs I will outline how I intend to utilize each data collection technique in my inquiry research.
I will also provide a chart showing which of my interventions I expect will help to answer each of my sub-questions.

**Qualitative Performances**

I intend to collect qualitative performance data as an indicator of progress in two of my interventions, Curriculum Integration and Service Learning. In Curriculum Integration the qualitative performance data will be based on summative assessment grades to ascertain students’ understandings of curricular topics, lessons, and activities. Tracking this qualitative data can also depict an increase, decrease, or stagnation in students’ progress toward sustainability literacy. Qualitative performance data within Service Learning will be the figures and statistics my students and I collect to illustrate the effectiveness of our Service Learning endeavors. These statistics will be recorded by both myself and my students and can also reveal if student activism increased due to my inquiry interventions.

Sub-questions addressed: 2, 3, 4, 5, 6

**Surveys**

I intend to use whole-class surveys as a way to collect data on my students’ attitudes and knowledge about sustainability before, during, and after my inquiry interventions. The surveys will be no more than five questions and will determine the growth of my students’ sustainability literacy and activism throughout my inquiry initiatives. If time permits, mini-surveys can also be distributed to my class to gain information about the impact of one certain intervention or activity. I also intend to send a survey to parents at the end of my inquiry process as a way to collect data on the effectiveness of my interventions; this will give parents an opportunity to tell
me if students have mentioned sustainability at home or requested sustainable changes around the home. Parents will also be able to provide their own thoughts, comments, and opinions.

Sub-Questions Addressed: 1, 2, 3, 4, 5

**Videotapes**

I will utilize video as a way to capture important moments during the implementations of my interventions. I intend to videotape at least two different occurrences of each intervention. I can then return to my video collection to choose appropriate proof for data or to refresh my memory of an event. The videos can answer questions such as, *What did the students do? How did it look? What portions of the intervention went well? What portions of the intervention were ineffective? What conversations occurred or comments were made in regards to sustainability?*

Sub-questions addressed: 1, 2, 3, 4, 5, 6

**Field Notes with Photographs**

I will record field notes and take photographs in order to track different areas of observation during each of my four interventions. The notes and photographs I take will allow my interventions to be inspected from different angles and further studied as data. Potential questions that field notes and photographs could answer include, *How are students working successfully or unsuccessfully? What did I do that was effective or ineffective? How did students react? What did students do? How did it look? What conversations occurred or comments were made in regards to sustainability?*

Sub-questions addressed: 1, 2, 3, 4, 5, 6

**Personal Weblog**

I will utilize this Weblog to record my personal thoughts and reflections on all aspects of my inquiry, including my four chosen interventions. Questions answered from my Weblog may
include, *What was I thinking as I implemented a certain intervention? How did I think it would work compared to how it did work? What were my immediate reactions? How did I feel? What were my interpretations of student behaviors?*

Sub-questions addressed: 1, 2, 3, 4, 5, 6

**Student work/artifacts**

I will collect or copy student work and student artifacts that are created during or in relation to each of my interventions. This data can potentially answers questions such as, *What are student work products telling me about the effectiveness of my initiatives? Are the important issues we discussed reflected in their work? What have they learned? What did I do to help them learn this? What progress have students made since the interventions began?*

Sub-questions addressed: 1, 2, 3, 4, 5, 6

**Interviews with Focus Group**

I will interview the five members of my focus group twice, once at the beginning of my interventions and once after my interventions have ended. I have chosen the members of my focus group based on their original level of interest in sustainability, ranging from disinterest to active and passionate interest. These interviews will tackle questions such as, *What do students think about my inquiry initiatives? What are their questions? Favorite portions? Disliked portions? Changing attitudes? Epiphanies? Opinions? Comments?*

Sub-questions addressed: 2, 3, 4
APPENDIX B: STUDENT SURVEY #1 AND #2

Have you learned anything new or important this year about the environment or sustainability?

Yes, I’ve learned even more about how crucial it is to save the environment and some creative way to do it (Miss. K…).

P.S. (Emily Margaret…).

How do you define sustainability?

I would define it as when your making a point and have proof to back it up.

Are there any environmental issues you wish people would fix or change?

I really wish people would preserve rain forests and endangered animals. There are so few, I almost want to bawl. One of my favorite animals is the ocelots. There are only 195 left due to human development in the US. Also, I have an idea to help quench human’s thirst for wood to save the rain forests. People could use bamboo which grows faster, uses less resources and work, and has*

Do you think that improving the health of our Earth and environment is crucial for a safe and successful future?

Yes, I think that most Americans or high living countries (in general) don’t realise it but our environment is more a part of us than we think. Oxygen, plants for medicine, vegetables, fruits, meat, water, and much more. I hope one day humans get over vendettas and/or crises enough to come together to save it.
Please answer the following questions to the best of your ability. It’s okay not to know an answer to a question—this is just to see what you know before beginning the new Enrichment lessons.

1. How would you define a “Global Issue”? Could you give any examples?
   Something that affects nature and natural resources like trees, water, etc.

2. Environmentalists claim that many countries in the world are living over the earth’s “carrying capacity.” What do you think “carrying capacity” means? Why is it such an important concept to many people?
   Our population is growing fast and the Earth can only hold so much weight and what an average person pollution and everyday things effects the world more than we think.

3. Can you think of any examples from our way of living here in America that would be unsustainable to the environment?
   - Not recycling
   - Polluting water
   - Cutting trees
   - Global warming (polluting air)

4. Are there any national or international problems/issues that grab your attention and cause you to wish you could make a change or difference in the situation?
   - Not recycling
   - Polluting air
   - Cutting trees
   - Polluting water
APPENDIX C: FOCUS GROUP INTERVIEW #1

**Student B.C.:** What is sustainability? Being sustained. What does a sustainable person do? It’s one of those words that I know but I don’t know.

*Can people your age make differences?* Well yeah, I hear about that stuff all the time like on Nickelodeon. And we started doing the sticker thing and that spread to everything.

*Does your life harm the environment?* Depends what you are doing. Like, if you were eating an apple and you dropped it on the ground it would make a new apple tree but not with oranges. But if you had 10 million factories that make pollution that would be bad for the environment, like litter and pollution and hunting. **Personally, what do you do to hurt or help the environment?** I recycle but I can’t think of anything bad that I do. **Why is not recycling bad for the environment?** You are wasting paper so you are wasting trees. **What about non-paper items?** I think it is better to litter than throw stuff away because when you throw it away it ends up in one big heap, but if tiny things are spread around it wouldn’t be as bad.

**Student B.F.:** What is sustainability? How much the earth can provide for us, how well we can preserve it.

*How would you explain how economy, society, environment are all interdependent around sustainability?* Say somebody takes a chainsaw and chops down a tree, somebody sells that, then that helps the economy and effects the person or society for that company- forestry- but say you plant a new no pesticide apple tree, then the farmer who made that will stay untouched, like the environment and the people in that society. And then the society will have clean water because their pesticides didn’t seep into wells. The farmer will be selling the apples which will be helping economy and farmer but since they are pesticide free it would do something to the economy, I’m not sure. **Gave example of farmer-pesticide-fish-eagle-eggs-endangered. Eagle endangered-fish overpopulated-less bugs.** You are seeing how one thing can affect everything around it! Plants start to die and then we start to freak out!

*Do you think people your age can make a difference?* Oh yeah, definitely! I’m planning on doing that thing with the mural. If I’m an artist when I grow up I’ll use environmentally friendly materials like Ellie!

*Do you think LE is a good way to make a difference?* Yeah! I’m looking forward to Refresh The Earth. Sometimes I daydream about going on strike and everything. I definitely thing kids can make a difference but most kids don’t have a big cause because it doesn’t affect us... it’s like some people don’t think it’s something we can march for and change, like the march in Birmingham. And some people who are older aren’t going to believe kids. Like Al Gore, people still aren’t listening to him and he has evidence, so for people to listen to kids you would have to shove them in Antarctica to watch the glaciers melt. I already know that E.M is going to save the earth.

*Is the way you live your life harmful to the environment?* I think a lot of people don’t realize how much they are harmful to the environment. We drive cars and emit CO2 and we use gas which gives oil companies a reason to pump it up and ravage natural beauty. Everyday we throw our garbage which is going to go to a landfill or dump. So I’d so I do but it isn’t as big of an impact as other people. We want to recycle everything but our recycling company doesn’t recycle paper. We use recycled paper towels and toilet paper and we have a huge recycling bin. We use cloth bags at the grocery store and save paper bags when we have to use them.

**Student T.F.:** Can you define sustainability? It has to do with making your surroundings, like water, clean for the future, for your children. Take good care of your environment so your children can have the same things that you have, the same properties. *How do economy, society, and environment all connect to sustainability?* It is around you, there can be litter, you can help your environment, which is connected to... I’m not sure. *Can people your age make a difference?* History can make you do something a lot, and you can spread it, like the college students that did the sit-in. *Is your lifestyle harmful to the environment?* I think a lot of people don’t realize how much they are
affecting it, so mine probably is to. Some people don’t want to spend the time figuring out what to recycle so they will just throw it out in the trash. And considering how much we throw away in days, months, years, it can make a big difference. I don’t think we are careful enough, we could be more careful. We are damaging something that we don’t even know we are doing. We also do something good because in the cafeteria we have recycling that isn’t a big deal. I think we don’t damage as much here as home.

APPENDIX D: FIELD NOTES

Recently in Miscellaneous Category

03/19/10: Field Notes By MEGAN LYNNE KIRKPATRICK on March 19, 2010 9:47 AM
V.F sent me an email last night: "this is a youtube vid. thats about recycling and its by college students maybe you can do one with your friends too! http://www.youtube.com/watch?v=kWMPNiEzAkw." He then asked me first thing in homeroom if I received the email. When I asked him how he came across it, he said he was looking up recycling videos in his spare time and found one that made him think of me.

M.R came up to me in homeroom exclaiming happily that she made her shorts out of old jeans. "I reused and reduced!"

G.C: "I'm so excited for March 22, that's when "The Story of Bottled Water" comes out. That should be a good one!"

10 out of 21 students re-used paper for today's spelling quiz.

M.R talked with a friend from L.E about our MNMS Sustainability Squad. Discussed their excitement for it.

M.R also told me she showed her parents The Story of Stuff video last night.

M.R: "My dad run an engineering company and he was wondering if you would like him to come in and talk to the class about what the difference is between an energy efficient building and a non energy efficient building. You can email him to ask him."

03/18/10: Field Notes By MEGAN LYNNE KIRKPATRICK on March 18, 2010 8:09 AM
G.O: "I was really moved by the Story of Stuff so I showed it to my parents and they really liked it. Afterwards my Mom was trying to think of all the things we have kept for longer than 6 months, and she came up with a lot, but I think she was just trying to make herself feel better."

03/17/10: Student Comments By MEGAN LYNNE KIRKPATRICK on March 17, 2010 8:12 AM
C.S: "Miss K, look at my water bottle! It says "see the difference you make" and is environmentally friendly!" Got it from Girl Scouts.

C.H: "Miss K, there are these things called Klean Kantine, they have a picture of the earth and all this writing on it about the environment and all that good stuff."

G.O: "Miss K, Old Navy sells these bags with silver earth bags and I hope they help encourage people to use less plastic. I was really happy to see them, I was like "Oh Cool!"

In answer to "Who is cutting down rainforests?" "BAD PEOPLE!"
A.D: Brought in bottle caps from home and asked where to put them

K.E: Told her mom about the bottle caps; mom has been collecting them.

T.F: Did someone use ALL of those paper towels!?

C.H, B.C, B.F, E.C, K.E and G.W gave up their recess on a gorgeous day to put stickers around the school. Others wanted to but were not allowed because they were missing h.w assignments.

03/15/10: While I Was Absent and My First Day Back By MEGAN LYNNE KIRKPATRICK on March 15
I missed three days of school when I was on Spring Break. When I returned to my classroom Monday morning I found a myriad of inquiry-related items waiting for me. My students had collected and counted bottle caps from lunch- they made tally counts on re-used paper and left them on my desk for me to store.

M.R, who was on vacation in Hawaii, brought me back a reusable bag for my gift and excitedly explained that the bag says "Recycle!" in Hawaiian. When I showed a book titled, "How To Reduce Your Carbon Footprint" to C.H, he asked if he could read it for S.S.R that morning. During S.S.R he walked up to me three times to verbalize his reaction to the book. He told me that he foresees a crisis with renewable energy that will parallel the fossil fuel reflection based on supply and demand. He was also disgusted that the sun provides enough energy every two hours to last the earth a year, yet that energy isn't harnessed. He made this clear to me by pointing to the sentence in the book and simply saying, "Miss K, UGH! Why isn't anyone using it!?”

During homeroom M.R came up to my desk and asked in a surprised, impressed voice, "Wow, did we finish the first paper binder? Awesome!"

In the "Watsons" reflection journals, two students said that a heroic act includes recycling.

For Spelling Monday morning, six students took paper from the paper binder for spelling words.

M.R asked me twice in one period if she could recycle her tin cans.

A.S asked if we could recycle paper towels. Since we can't, I told her we could reuse them.

I told my students after lunch that I had updated our iMovie to make it work for morning announcements to introduce the school to our stickers, students erupted into cheers and M.V asked if we could watch it right then. Other students agreed and asked Mr. G. After showing it, I asked students, "If you were not in the video and you would still like to be,” seven students raised their hands. When one student backed out after realizing he had to sacrifice recess to be in the movie, A.Y said, "Oh, C'mon Seth, it's for the environment!” B.I and B.C asked if their part could be included in the movie. M.R came up with a creative idea (split screen) to include everyone without making the movie longer.

C.H told his mom about hour bottle cap initiative; she told her friend, and ever since C.H has been bringing in large paper bags filled with bottle caps.

Without my prompting, the students who were listed for Monday's bottle cap collection collected and washed the bottle caps. E.M had to finish this job because they did not.

03/02/10: Field Notes By MEGAN LYNNE KIRKPATRICK on March 2, 2010 11:24 AM
B.F: It's all about people's greed- if somebody was raised in a simpler lifestyle it would be easier for them to "go green" because they wouldn't have that greed.
M.R: We have the bottle cap collection but what about the water and milk bottles? Are they recycled?

B.I: Send a website to Mr. Given and myself- "A billion for a billion"- which shows how many children have died of hunger compared to how many emails have been sent and money spent on pet food since the website had been opened. At least five or six students made comments about connections. Mr. Given and I alternated making comments about the drastic difference in the information and made sure to show that the students CAN make a difference!

12 students stayed in at recess today to help with the sticker initiative. We created new portions of the video that we hope to play on the morning announcements. All students were involved in the conversations to decide what to do, why, and how to reach all of our audience. Students volunteered creative and clever ideas, many of which we used in the videos.

E.M and a few other girls worked to collect and wash the bottle caps.

We took pictures of the whole "crew".
The students came up with slogans for the "TCFT" and "Paper Police".

### Recently in Direct Instruction Category

**03/17/10: Direct Instruction Lesson** By MEGAN LYNNE KIRKPATRICK on March 17, 2010 2:17 PM

Today I am showing my students "The Story of Stuff". This video discusses environmental, economic, social justice, and anthropological issues. While people do disagree with this movie, I aim to show my students multiple viewpoints and to help them understand perspectives. I chose to use this video because I have a very short time period to teach; instead of fighting to keep my students attentive during the last period of a gorgeous day, I will show a movie to keep their attention and teach them a plethora of valuable information. To get the students thinking about sustainability, I will assign a pre-writing activity: "List words or phrases that come to mind when I ask the question, 'What does a sustainable life and earth look like?'" Students will be given used paper to make their lists, which I will collect at the end of the period. As an extension assignment, I will ask students to use the information they learned in "The Story of Stuff" to create an advertisement to help our school understand the problems our environment faces. I want to hang these ads in the hall, so I will give students 2 work days to ensure their ads are high quality.

**02/22/10: Direct Instruction Lesson 2** By MEGAN LYNNE KIRKPATRICK on February 22, 2010 4:07 PM

Main question of this lesson: What is sustainability?


Appeared inattentive or confused: T.F, N.K, T.T, A.S, P.N, J.G

Main moments:

- After my explanation of the definition of sustainability and a discussion about examples, A.D admitted that she did not understand it. I asked other students to rephrase their understanding of it. By the end of the class, A.D said "I understand it when you're talking, but then I'm confused again once you stop talking."
- After class I asked P.N who was very quiet throughout the class, "So, is this making sense to you?" He replied, "Sort of. I mean, I think I get some stuff and don't understand other stuff... well, I guess I just don't really understand the overall idea."
- V.F volunteered a definition of sustainability that, although it did not touch on the main definition, included nearly all of the keywords shown on the left of the board.
- Many students volunteered connections to what their own parents do, what stores do where they shop, movies they have seen.
- I used the plastic bag power point and asked students how it shows unsustainable living.
**02/17/10: My First Direct Instruction Lesson**

By MEGAN LYNNE KIRKPATRICK on February 17, 2010 11:16 AM

Highlights from the pre-writing:
- The majority of my students did not understand the prompt. They asked a multitude of questions before completing the activity. This caused a large delay. This showed me that my students simply do not have the necessary background knowledge needed to answer my prompts. I want to use my next lessons to introduce students to basic concepts.

Highlights from the activity lesson:
- Many students were unable to pay attention to the activity; they talked over classmates, dropped the string, and had distracting side conversations.
- Most students knew what their word meant; only a few needed clarification.
- Quite a few students were excited about their word and begged to be called on to share their thoughts.
- Not all students were able to go because of time.
- I found it very easy to help students make the connections, although I felt at times that I was not being heard.

I left this lesson feeling very discouraged and believing that my efforts were going to waste. After reflecting, I realize that I was using a snowy day during 8th period to introduce concepts that they did not fully understand. Not only this, my mentor was not present to help students understand they needed to respect my requests and listen to my directions. I believe that my next effort during an "Inquiry period" will be to simplify the ideas and ask students what sustainability means in their own lives. We have done a great job of connecting environment-economy-society, but they will not understand it until the ideas are brought down to a local and personal level.

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**Recently in Enrichment Integration Category**

**03/18/10: Enrichment Lesson**

By MEGAN LYNNE KIRKPATRICK on March 19, 2010 9:54 AM

Students talked with me and with each other to pick their projects. Each student had a variety of ideas; the challenge occurred when students needed to pick just one project. B.F was very upset and actually began crying because she couldn't find an idea that she liked enough. Later in the day we came up with one together, and she seemed thrilled about it. The class functioned very informally, though I was able to assert enough authority to make it a productive lesson. D.D was unable to co-teach with me due to prior commitments, so I was able to teach this myself. Below are the projects students decided on:

- W.B and A.R: Making a website on which all of L.E work and information can be posted.
- A and L: Green Fun Night
- B.F: Paper Waste Swan to place in front lobby
- K.E and G.O: School challenges
- E.M and R: Working with the school to increase bottle cap initiative
- I: Cool Earth?
- M.R: A "bazaar" with home made earth friendly products.

My students have an excellent idea of what the earth requires for increased sustainability and also contain incredible motivation to make it happen. Their idea cover a wide variety of issues.

**03/04/10: Enrichment Integration**

By MEGAN LYNNE KIRKPATRICK on March 4, 2010 8:59 AM

E.M: Grants for all sustainability initiatives in schools, writing letters to different places to have materials donated for family "kits", writing to cereal companies to encourage using less cardboard.

K.E: Challenges

G.O: Help E.M with grants. Feels writing to cardboard is too hard. Which recycled/environmentally friendly is better option?? Talk to recycling companies to make less pollutants and recycle more.

B.F: Mural

Miss K: Writing assignment for students to write letters to companies to give "kits"
**02/19/10: Enrichment Lesson 2** By MEGAN LYNNE KIRKPATRICK on February 19, 2010

**MAIN IDEA:** How do the big ideas of sustainability have to do with our local community?

**INTRODUCTION:** Make a journal, something to use to keep ideas in. This isn't something we will collect and grade, this will be for you to collect ideas. *Make it out of already existing materials.

**Discussion topics:**
- What can we recycle? Let's find out.
- What is more environmentally friendly? Chemicals in the nalgene? BPA.
- Even being environmentally friendly, are you impacting the environment negatively?
- Getting detergent? 7 Generation is made in heavy plastic which takes heavy bottles which need petroleum.
- Let's research questions and find out and put them on morning announcements.
- Can we use solar panels in our schools? For FCS washing machines? For exit signs? What are the state regulations? Does our school have the technology? We can write to the state officials to try and change.
- Make posters and put them around the school to let people know what they can do to help the environment?
- Make a power point and put it on the school website?
- Have a contest in our school to see who can recycle the most and whoever wins gets a prize.
- Have a guest come in that has to do with sustainability?
- Ecological footprint, trash count, trash-less day
- What can we recycle in our school? People need to know!
- A.R: I think we should make a video on the morning announcements to say how important it is to recycle. We could have fundraisers at school to get money to buy things for making the school greener.
- Remember the other two R's too- all hands went up!
- G.O: Bucknell grants, my aunt runs them, I'll ask.
- E.M: I think we should have challenges but if we make it to be the most I think people will try to use more to get more recycled and then it will back fired. What if we had classes research. Challenge questions? Also we can have "No electricity day, no paper day."
- Things to research: How do we use the three R's in our school? Grants? What can we recycle?
- If we come up with a set of plans, Mr. D will build a composter! List of materials!
- Me: Talk to D.S about what materials we need to build a composter and what it entails.
- B.F: We should use the morning announcements to make a video and tell people what they can and can't recycle.

**CONTACT GUY FROM OPP ABOUT BINS FOR RECYCLING!**
- Don't tell classrooms you are taking an inventory of trash, then announce it on the morning announcements.
- R.W: Get cafeteria to use reusable containers for one day. Would this work? Is washing it worse or better than throwing away? Isabelle: Compostable plates?
- I.S: Eco-friendly tip of the day. (Gwen: 100 tips/poster).
- Canvas bags for SCASD- PTSO as a fundraiser?
- Compostable paper bags?
- How can we use renewable energy at our school?
- K.E: We need to get upper grades to do the paper initiative too, and save paper like we do. (D.D: 7th grade Green and Purple have planning time first period, schedule a time with representative and explain what we would like them to do) (Me: Buy everyone binders to put their paper in).
- G.O: Talk to custodians to not collect trash.
- B.F: Murals in Cafeteria! ME: Talk to D.S about the artist that did PF murals. B.F's family is so artistic!! They can help us to! (Students suggested it).
-G.O: I know someone on the food board, maybe we can write something and we can give it to them and they can read it to the board. We could talk to schools who are remodeling and encourage them to use more ecological friendly materials.

-B.F quickly drew a mural idea of a hand holding a can with the earth.

02/15/10: Enrichment Lesson 1 By MEGAN LYNNE KIRKPATRICK on February 15, 2010

This morning marked the kick-off and introduction to the next four months in Enrichment. The class consisted of five of my students, all female, and Aside from wanting to introduce the definition of sustainability and draw the connection to global issues and interdependence, D.D and I did not plan specifically what to do during this period because we felt that the students would lead us in the direction most meaningful to them. I am glad we planned it that way because as soon as we asked students to offer us their background knowledge on sustainability they were off and running. The conversation was led completely by student comments; they were so deeply passionate about all issues that we had more raised hands than we could call on in the time allotted. To my astonishment, we not only defined sustainability using a variety of student comments and teacher supplements, but we also covered a great deal of the main sustainability issues: overpopulation, the need to understand perspectives, soil erosion and healthy farming practices, reducing and reusing consumption, supply and demand, food supply and distribution, international situations, water pollution from pesticides and fertilizers.

03/17/10: Curricular Integration By MEGAN LYNNE KIRKPATRICK on March 17, 2010 8:29 AM

SSR: Two of my students lacked SSR books today. This prompted me to give A.S a book I bought for the class called "How to Reduce Your Carbon Footprint." I bought this book over Spring Break and was trying to find a way to incorporate it in my class. A.S's lack of book helped me realize one more way to encourage sustainability literacy within the existing curriculum. I now see that I can offer students relevant, age-appropriate books during SSR. Just as our librarian gives book talks and Mr. G encourages popular young adult books, I can collect appropriate sustainability books and introduce them to my students before S.S.R each morning. Since students can read whatever they would like during S.S.R, this provides a perfect opportunity for students to explore sustainability concepts on their own. I also hope that my personal "pull" on students- the fact that they like me as a teacher and respect me as a person- can encourage them to read the sustainability books when normally they wouldn't.

A.S did read the book I gave her, and at the end of first period I will ask her what she thought of it. I also gave C.H my "Ecological Literacy" book from BiSci 3. He came up to me after finishing his LAC test and, showing me the few pages he had read in the book, said "I am so excited about this! It is such an awesome book!! Can I read all of this?"

03/02/10: Bottle Cap Initiative By MEGAN LYNNE KIRKPATRICK on March 2, 2010 11:16 AM

AREA: I have been given permission to lead 3 AREAs in the fourth marking period. An AREA is an 8th period class in which students get to pick the activity they partake in. Each teacher offers different AREAS. For one of my AREAs I picked "Going Green." For this AREA, I want students to perform different sustainability and environmental projects around the school. I am thinking I could supplement these projects with different discussions and presentations about the issues at hand. This AREA offers students who are highly motivated and interested in "Going Green" to voluntarily partake in these activities. I feel that it provides a perfect outlet to extend my initiatives within the school and truly help a selection of students gain sustainability literacy and activism.
Students E.C, B.C, C.S, M.V, and C.H volunteered today to make an announcement in the cafeteria. This announcement informed the Blue and Yellow teams of our bottle cap initiative and asked them to place their bottle caps in the collection box as they went to recycle their plastic. C.S started the announcement by getting everyone’s attention; M.V introduced our project, E.C explained the process, and B.C pointed out the collection box. C. H came up with the idea to make a second announcement when the Yellow team arrived. I was only present for the first announcement, but the students did the second announcement without me.

I asked for student volunteers to make the announcement to 7th and 8th graders- 11 of my students volunteered! I brought two students volunteers ( ) with me to make announcements in 7th and 8th grade lunches. I was surprised that C.S wanted to help because she hasn't been too involved in our environment initiatives.

K.E worked today to make a second collection container, and E.C has been collecting bottle caps from her family and friends, as is my mentor.

Within one week, our original tissue box for bottle caps is completely filled up!

02/17/10: Service Learning By MEGAN LYNNE KIRKPATRICK on February 17, 2010 2:23 PM

On Friday at recess my students and I came up with the idea to laminate our stickers in an effort to prevent vandalism. We received the stickers back today; all 270 of them! About 10 of my students were thrilled at the prospect of staying inside to cut out the stickers and prepare the stickers to be hung around the school. The rest of the students appeared indifferent or worried about other priorities, which I do understand. Approximately eight students stayed inside to cut out the stickers, and they had a blast doing so. One group giggled and goofed off but still completed the mission, while the other group worked seriously and with focus. Within 20 minutes they managed to cut out 270 stickers. They asked me multiple times when we could begin putting them up; many asked what our modus operadi would be and others requested that they be allowed to participate in putting the stickers around the school.

I love to see this small group of students continue to show enthusiasm about our sticker initiative, but I worry that they do not fully understand why we are doing it. I want them to be knowledgeable about the process behind paper making and the environmental affects of using too much paper. I am considering using some time this week or next week to discuss these topics. As I said in a recent blog, it is definitely time to stop hammering broad concepts into my students' brains; I now want to concentrate on specific idea that the students can relate to and impact in their own community.
APPENDIX E: STUDENT WORK

1. An activity in which students identified the process of making a chocolate bar and wrote a reflective paragraph on what they learned:

<table>
<thead>
<tr>
<th>Simple Chocolate Bar</th>
<th>Date:</th>
</tr>
</thead>
</table>


<table>
<thead>
<tr>
<th>Country</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hershey, PA</td>
<td>Chocolate Factory</td>
</tr>
<tr>
<td>Ivory Coast, Africa</td>
<td>Chocolate</td>
</tr>
<tr>
<td>Sao Paulo, Brazil</td>
<td>Nuts</td>
</tr>
<tr>
<td>Dubai, UAE</td>
<td>Wrapper</td>
</tr>
<tr>
<td>Barbados, Caribbean</td>
<td>Sugar</td>
</tr>
<tr>
<td>Vanuatu, South Pacific</td>
<td>Coconuts</td>
</tr>
<tr>
<td>Ottumwa, Iowa</td>
<td>Corn Syrup</td>
</tr>
</tbody>
</table>

Write at least 6-8 lines that completes the following sentence:
From today’s lesson “Simple Chocolate Bar”, I learned...

I learned that if something happens to one part every thing crashes too. First, if a drought happens and the coca beans can’t be made neither can the chocolate. Then there is no chocolate to make. Next, there are no jobs and then a lot more people need jobs and homes now. The world will have a problem, because now they’re not giving to the company so now they have more supply on that. Then they used to and there is no place to put it but on the ground. Then the earth crashes, the people crash and now noone is happy.
2. Pre-writing Prompt Before Direct Instruction Lesson: Think about the last meal that you ate. How does that meal connect to the environment?

3. Pre-Writing Prompt Before Direct Instruction Lesson: What does a sustainable earth look like?

A Sustainable life/earth looks like:
• No pollution
• No carbon monoxide
• Green
• Not wasting electricity
• Using front and back of paper
• Not wasting water
• Not using fossil fuels
4. Spelling homework. This student mentioned an ecological footprint in #2:

Core Words: contain, fit, equal, value, yard

_Thursday:_

1. Add as many prefixes and suffixes to EQUAL as you can think of (at least 5). Use a dictionary to make sure you’re coming up with real words.

1) unequal 2) equally
3) equality 4) equalled
5) equaling

2. Write 5 meaningful sentences using a different form of EQUAL in each.

1) My life is unequal when my sister is in it.
2) My cousins and I get an equally amount of Easter Eggs.
3) There is no equality in the world, which forces us to have wars and poverty.
4) My math problems all equalled the same thing.
5) We are equaling five earths right now.

Yeah!

3. Be ready for the Sentence Dictation Review!
How has learning enrichment helped you form your skills within sustainability? “The Learning Enrichment classes have helped me tremendously because I have learned how to put my ideas to the test... to actually make them happen. With the Learning Enrichment, I have gotten valuable time to see how I can help the Earth and make a positive difference in the world. I have learned that things can't just happen with a snap of your fingers. You have to work toward them, eventually gaining more experience and becoming better at making things happen more quickly. I have learned that you need patience to do all sorts of things such as getting permission to do what you want to do, design it and all sorts of little things like that. Those little things are crucial to the survival of your project. I have also learned how to work with a group to combine everyone's ideas, picking out the things that would probably not work, making an even better project than I started with.”
APPENDIX G: FOCUS GROUP INTERVIEW 2

FOCUS GROUP INTERVIEW 2 (POST INTERVENTIONS)

B. C: How do you define sustainability? A place where it is possible to live, rather than an unsustainable place you can’t survive for long. Our earth is becoming unsustainable from global warming and pollutions.
Give me your honest opinion about the sustainability lessons that I taught to you. Just from doing other stuff with you I had already learned a lot, and from my Bills to laws. But some stuff I learned, like watching the Story of Stuff I learned about how many things are thrown away and wasted and how we take up one third of the whole world’s natural resources but if everyone else is using the same or more then there is more than three countries using a third, it said we would need like 20 earths to keep up everything we are doing.
Did you like the lessons? I thought that most of the things were really helpful and it was really good that now not only the people who stay in for recess knows, but our whole class knows and the whole school knows because of the announcement we made.
Did you change any of your actions because of what we have done? I always use recycled paper now instead of bringing lined paper from home. I even taped two together to make it look blank on both sides. With the bottle cap thing, I’m now collecting them at my house to bring them in from soda and water bottles and every time I have my milk I drop it in the collection bin. I saw people dropping a full milk with the cap on in the trash. I was in line to dump my tray and I saw someone about to throw out their cap and I lunged forward and was like, “NOOOO!” and I recycled it for him. I have stopped people to make sure they recycle their bottle caps.
Anything else you’d like to say? I think something that we could do is with the Going Green Area, we could actually get all of the recycled paper and cardboard and make a big collage poster to put up like flyers but out of recycled materials to make messages. I was thinking about a giant poster with two sides- Dumpsters Now and What Dumpsters Can Be and make one side blank and one side gross. Put silver glitter instead the What Dumpsters Can Be to make it look clean. Me and Cody could make comics about recycling or dumpsters. We could just start doing stuff like that.

B. F: How do you define sustainability? I would define it as how much and how long the earth can provide for us, all of the resources we need to survive off of. I think a huge chunk of the population would die if we didn’t have oil which we use so much of. There is also water, which we have hundreds of billions of gallons right now but eventually we are going to run out. At the rate we are going it is faster than if we just did it off of what we need like for drinking and showering and making things. Sustainability is also connected to the resources we have- it’s like what we have and what we would want. We SHOULD be working off solar and wind but right now we don’t know how to make it provide for what we use right now.
Give me your honest opinion about the sustainability lessons that I taught to you. From the very first lesson I thought they were cool, but I liked them because I thought I could just goof off and chill since I already knew stuff about recycling. I figured it was just for the kids who didn’t know anything so I thought I didn’t think it was important. But then after a few classes it got really interesting, like the Story of Stuff- that was like a punch in the face, it was so revolutionary to me. It completely just blew me away, it was mind boggling. Also, when we learned about interdependence and I found out how many resources it takes to get a stupid little chocolate bar over here, I was thinking we are such wasteful people! So my perception on these things morphed, it melded, it wasn’t the easy going chill period I thought it would be. I learned a lot more than I thought.
What were the most important things that you learned from the lessons? I already told you about interdependence, everything depends on each other and is connected. I had learned about it in science but I had never thought about it with the human race, I had just thought of it with animals (the story with the eagle). But now I’m thinking what is we lost India to global warming, we probably would lose a lot of our crops and gold-mining, and we rely on those things around the world. People would start freaking out and overusing mines in other places, then African people
would die and more kids would be employed and they wouldn’t have enough workers, people would be overworked. The people who are paying them wouldn’t buy enough food or water so the people working would be dehydrated. So you are understanding the far-reaching implications. It would just crash down, which is what is happening with the economy right now. I think maybe we should have an inquiry class for interdependence because if people knew about it, we may not be in the situation we are now.

Did anything you learn change the way you act? Oh yeah. Before the inquiry lessons E.M would ask me if I wanted to do bottle caps and I would be like “eh, I don’t really want to, I’d rather go out to recess,” but then recently when she asks I’m like, “YEAH!” A lot of times at school I used to use 2 paper towels and now I use 1 or usually none. Would you say you are more aware of your actions and what you are using? Oh yeah. I wince whenever I see how much paper we have in our trashcan at home because they don’t take paper at home. You should bring it into the school. Yeah I asked my Mom but she said it was fine and it wouldn’t really make that much of a difference. And I was just like, “Oh, come on!” I just really want to show her the Story of Stuff.

What did you think of learning enrichment? Did you learn from it in addition to my lessons? Did you like it? Did it help? Um... in different ways. It enhanced my creativity. Honestly, I just think LE is good with creativity and thinking of HOW we can solve it and enhance our horizons. “What is you looked at all of your possibilities in the world,” like they said in Star Treck, and I guess I can really make a connection with that. Maybe we should focus ourselves on making our culture deeper. It would be so amazing if U.S was the first place to search through all of the dumps and looked for paper and recycled. If we had jobs that did that and made artsy things with it. There are so many things we could do! There are so many unemployed artists who could be doing things with stuff just being wasted. We can do so much more with our culture, we could be the most educated, the most ecologically sound, we could be logical people instead of these war mongers. If the entire country did something like L.E... Obama could make jobs to help the environment. L.E got me thinking about our options! Like that island of trash (we learned in News Currents) if we could just take that with a net and separate it.

T.F:

How do you define sustainability? Hasn’t changed too much, I’m not saying you didn’t teach me anything. Sustainability is just to help to have your kids have the same options to live in a nice environment, like helping the earth and make the kids in the future have a good of a chance as you had to have all of these resources.

What did you think of the lessons I taught you? Do you think you learned from them? I’ve definitely learned how much more we are affecting the earth- more now than I did in the past. It just tells you how much a little thing can make a big difference. I learned the cycles which I would never have had a clue what they were before- like the Story of Stuff that had all of those processes.

Was one thing most important that you learned? There definitely is I’m just trying to figure it out.

Do you feel like you changed your behavior from what we have done? All of those lessons have made me more cautious about what I am doing, instead of just throwing things away. I pay more attention to where I am throwing things away so it can help more because I learned how much of a difference one person can make and how many of us there are... the world can’t take it. It made me think that I should help a little bit more and pay a little bit more attention to that.
<table>
<thead>
<tr>
<th>STUDENT</th>
<th>INTERVIEW 1</th>
<th>INTERVIEW 2</th>
<th>INTERVIEW 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.C</td>
<td>Deforestation</td>
<td>Food Waste and pollution</td>
<td>Pollution, deforestation, incinerators, landfills, plastic use, consumerism, waste</td>
</tr>
<tr>
<td>T.F</td>
<td>Deforestation, not recycling</td>
<td>Not recycling, polluting water, deforestation, global warming</td>
<td>Pollution, fossil fuel use, littering, not recycling, deforestation, factory use, awareness, water pollution</td>
</tr>
<tr>
<td>K.E</td>
<td>Recycling available</td>
<td>Pollution, waste, population</td>
<td>Consumerism, waste, manufacturing, technology dependency, lack of awareness, chemical use, wants/needs, deforestation, climate change, poaching, pollution</td>
</tr>
<tr>
<td>J.G</td>
<td>N/A</td>
<td>Oil use, landfills</td>
<td>Landfills, preservation of wildlife, reusing water bottles</td>
</tr>
<tr>
<td>A.S</td>
<td>Nothing</td>
<td>Nothing</td>
<td>Water pollution, oil spills, consumerism, waste, air pollution</td>
</tr>
<tr>
<td>B.C</td>
<td>Recycling</td>
<td>N/A</td>
<td>Recycling, “There’s too many of them.”</td>
</tr>
<tr>
<td>A.D</td>
<td>Use of water</td>
<td>Nothing</td>
<td>Using plastic bottles, global warming, driving, war</td>
</tr>
<tr>
<td>P.N</td>
<td>Recycling paper</td>
<td>Factory pollution, global warming, nuclear war</td>
<td>Nuclear war, deforestation</td>
</tr>
<tr>
<td>C.S</td>
<td>Air pollution, gas pollution</td>
<td>Pollution, global warming</td>
<td>Deforestation, building, big ecological footprints</td>
</tr>
<tr>
<td>B.F</td>
<td>Deforestation, endangered animals</td>
<td>Pollution, waste, global warming, animal endangerment</td>
<td>Pollution (air, water, soil), global warming, over consuming, deforestation, endangerment of animals, war, selfishness, oil, shipping products</td>
</tr>
<tr>
<td>V.F</td>
<td>Deforestation</td>
<td>Pollution, war</td>
<td>Recycling, clean energy, greenhouse gases, water use, food, pollution</td>
</tr>
<tr>
<td>B.I</td>
<td>Recycling, pollution</td>
<td>Population, global warming, nuclear power</td>
<td>Pollution, global warming, killing animals</td>
</tr>
<tr>
<td>T.T</td>
<td>Littering</td>
<td>Nothing</td>
<td>N/A</td>
</tr>
<tr>
<td>N.K</td>
<td>Littering</td>
<td>Nothing</td>
<td>N/A</td>
</tr>
<tr>
<td>S.E</td>
<td>Recycling, food waste</td>
<td>Littering</td>
<td>Paper waste</td>
</tr>
<tr>
<td>A. Y</td>
<td>Food use, money</td>
<td>Factories, littering</td>
<td>Deforestation</td>
</tr>
<tr>
<td>G.O</td>
<td>Deforestation, animal extinction</td>
<td>Use of natural resources, pollution, global warming, money distribution, poor education</td>
<td>Buy less, reuse, consumption, global warming, deforestation, trash and landfills, pollution (water, air, noise, land), our mindset (consumption, dependency on oil and electronics and machines)</td>
</tr>
<tr>
<td>E.C</td>
<td>Composting, recycling, education, research, laws, global warming</td>
<td>Shipment of food, pollution, oil use, electricity, paper use, deforestation,</td>
<td>Climate change, pollution, humans, education, less dependency on oil, reuse of resources and materials, group collaboration, lack of “earth love”</td>
</tr>
</tbody>
</table>
## APPENDIX I: FIELD NOTES ANALYSIS

### Taken from Field Notes and Unprompted Student Work

<table>
<thead>
<tr>
<th>ACTION</th>
<th>Student occurrences in February</th>
<th>Student occurrences in March</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proud of personal sustainability</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Commenting on my love for sustainability</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Further researching sustainability</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Changing behavior to become more sustainable</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Spreading information and enthusiasm to others</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Making observations about local or global sustainability situations</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Engaging voluntarily in Service Learning projects</td>
<td>6</td>
<td>6 + Every Single Day for bottle caps, stickers, and paper</td>
</tr>
<tr>
<td>TOTAL STUDENT ACTIONS</td>
<td><strong>15</strong></td>
<td><strong>37</strong></td>
</tr>
</tbody>
</table>

### PATTERNS

<table>
<thead>
<tr>
<th>DIRECT INSTRUCTION</th>
<th>TWO</th>
<th>THREE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ONE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student confusion and inattentiveness decreased as interventions continued.</td>
<td>Every student participated at least once during lessons.</td>
<td>Students demonstrated the most engagement and enthusiasm when topics or type of lesson allowed for personal or local connections.</td>
</tr>
<tr>
<td><strong>TWO</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students embraced AREA and SSR ideas.</td>
<td>The students who frequently spoke were the same students who contributed to discussions during Direct Instruction.</td>
<td></td>
</tr>
<tr>
<td><strong>THREE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Projects: bottle caps, stickers, and paper saving.</td>
<td>A core group of students continually took initiative to complete projects.</td>
<td>A core group of students (between 5 and 8) gave up recess to continue projects.</td>
</tr>
<tr>
<td>Opportunities for creativity, asking questions, and problem solving</td>
<td>Opportunities for open discussion of sustainability issues.</td>
<td>Topics for student projects included school awareness and school habit change</td>
</tr>
</tbody>
</table>
### APPENDIX J: INTERVIEW PATTERNS

<table>
<thead>
<tr>
<th>Definition of Sustainability</th>
<th>Did you like lessons?</th>
<th>What did you learn from lessons?</th>
<th>Did you change your actions because of lessons?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B.C</strong> INTERVIEW 1: Being sustained. It’s one of those words that I know but I don’t know. INTERVIEW 2: A place where it is possible to live, rather than an unsustainable place you can’t survive for long. Our earth is becoming unsustainable from global warming and pollutions.</td>
<td>I thought that most of the things were really helpful and it was really good that now not only the people who stay in for recess knows, but our whole class knows and the whole school knows because of the announcement we made.</td>
<td>Just from doing other stuff with you I had already learned a lot, and from my Bills to laws. But some stuff I learned, like watching the Story of Stuff I learned about how many things are thrown away and wasted and how we take up one third of the whole world’s natural resources but if everyone else is using the same or more then there is more than three countries using a third, it said we would need like 20 earths to keep up everything we are doing.</td>
<td>I always use recycled paper now instead of bringing lined paper from home. I even taped two together to make it look blank on both sides. With the bottle cap thing, I’m now collecting them at my house to bring them in from soda and water bottles and every time I have my milk I drop it in the collection bin. I saw people dropping a full milk with the cap on in the trash. I was in line to dump my tray and I saw someone about to throw out their cap and I lunged forward and was like, “NOOOO!” and I recycled it for him. I have stopped people to make sure they recycle their bottle caps.</td>
</tr>
<tr>
<td><strong>T.F</strong> INTERVIEW 1: It has to do with making your surroundings, like water, clean for the future, for your children. Take good care of your environment so your children can have the same things that you have, the same properties. INTERVIEW 2: Hasn’t changed too much, I’m not saying you didn’t teach me anything. Sustainability is just to help to have your kids have the same options to live in a nice environment, like helping the earth and make the kids in the future have a good of a chance as you had to have all of these resources.</td>
<td>N/A</td>
<td>I’ve definitely learned how much more we are affecting the earth- more now than I did in the past. It just tells you how much a little thing can make a big difference. I learned the cycles which I would never have had a clue what they were before- like the Story of Stuff that had all of those processes.</td>
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<td><strong>B.F</strong> INTERVIEW 1: How much the earth can provide for us, how well we can preserve it. INTERVIEW 2: I would define it as how much and how long the earth can provide for us, all of the resources we need to survive off of. I think a huge chunk From the very first lesson I thought they were cool, but I liked them because I thought I could just goof off and chill since I already knew stuff about recycling. I figured it was just for the kids who didn’t know anything so I thought I didn’t think it was important. But then after a few classes it got really</td>
<td></td>
<td></td>
<td>Oh yeah. Before the inquiry lessons E.M would ask me if I wanted to do bottle caps and I would be like “eh, I don’t really want to, I’d rather go out to recess,” but then recently when she asks I’m like, “YEAH!” A lot of times at school I used to use 2 paper towels and now I use 1 or usually none. Would you say you...</td>
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of the population would die if we didn’t have oil which we use so much of. There is also water, which we have hundreds of billions of gallons right now but eventually we are going to run out. At the rate we are going it is faster than if we just did it off of what we need like for drinking and showering and making things. Sustainability is also connected to the resources we have - it’s like what we have and what we would want.

Interesting, like the Story of Stuff - that was like a punch in the face. It completely just blew me away, it was mind boggling. Also, when we learned about interdependence and I found out how many resources it takes to get a stupid little chocolate bar over here, I was thinking we are such wasteful people! So my perception on these things morphed, it melded, it wasn’t the easy going chill period I thought it would be. I learned a lot more than I thought.

warming, we probably would lose a lot of our crops and gold-mining, and we rely on those things around the world. People would start freaking out and overusing mines in other places, then African people would die and more kids would be employed and they wouldn’t have enough workers, people would be overworked. The people who are paying them wouldn’t buy enough food or water so the people working would be dehydrated.

APPENDIX K: STUDENT WORK PATTERNS

Feb. 15- Simple Chocolate Bar:
Interdependence (One thing can effect everything) I
Need many resources (energy, human labor, products) to make one thing I
One thing disappearing can affect everything, like a chain reaction I
Ingredients and materials come from around the world I
Food doesn’t simply show up in the grocery store I
Everything we use has some history behind it I
All of the above have a negative impact on the environment I
The money we pay for a product does not cover the true cost (shipping, growing, fertilizing) I

Feb. 16- Where Did Your Food Come From?
Oil used to ship products K.E, G.O A.S, P.N, E.C, K.K, C.H,
Packaging K.E, P.N, C.H, B.F
Chemicals to color packaging K.E
Assembly K.E
Fertilizers used to grow products K.E
Waste products going to landfill G.O, A.D, B.I, B.F
Energy used to produce/upkeep food K.E, G.O, A.D, S.E, C.H
Made in factory I, T.F, B.F, C.H
Water and air pollution B.F,
Nothing T.T, N.K,

March 18- What Does a Sustainable Future Look Like?
Fuel-efficient cars/ no cars: S.E, B.I, G.O, M.R, G.C
Smaller electricity use: S.E, B.I, T.T
Active children: S.E
Education: S.E
Equalized wealth: S.E
Sun: A.D
Animals living in habitats: A.D, M.V, I, K.E, A.Y, G.O
Cyclical methods of consumption: C.H
Recycling: C.H, M.V, A.S, G.C
Life: I
Water: I, T.F, T.T
Space: I
Working Together: K.E,
Controlled population: K.E, G.C
Responsible Citizens: K.E
Giving back what you take: B.F
No waste: B.I, M.R
No disease: B.I
Using front and back of paper: T.T
No fossil fuels: T.T, T.F
Energy-efficient buildings: G.O, G.C
All people equal: G.O
Clean and healthy natural environments: G.O, M.R, T.F, G.C
Happiness: P.N, M.R
Happy E.M and Miss K: A.S
Personal food growth: E.C
No chemical use: E.C, G.C

Unprompted Work:
A.D in spelling sentences March 15: “We are equaling 5 earths right now” in reference to America’s ecological footprint. “There is not equality in the world, which forces us to have war and poverty.”
C.S in reading journal Feb. 25: “A small thing you do everyday is heroic, like recycling.”
T.F in reading journal Feb. 25: “A hero can do such a small thing and make a big difference. For example: recycling may be a small thing but one recycled thing can change a lot. That’s for you Mrs. K ☺

How can you produce less plastic garbage?
Use less plastic items: T.T, V.F, M.Y, K.E
Stop buying plastic at the store: T.T, M.R
Turn plastic into crafts: A.Y, C.S, K.E
Make dinner, don’t order out: V.F,
Bring own grocery bags: V.F, E.C, A.S,
Don’t buy products packaged in plastic: M.R, G.O, G.C
Companies make biodegradable plastic: J.G, P.N
Hand make items: T.F
Don’t use plastic dishware: G.O, G.C
Use containers, not baggies: E.C

**Class derived list of global issues (March 26):** Getting rid of habitats, loss of biodiversity, loss of natural habitats, deforestation, too much stuff! (consumptions), consuming and consumerism, too much want, wars, overpopulation, using lands, lack of awareness, prejudice, hurting ourselves, global warming, climate change, poverty, selfishness, lack of education, pollution (air, land, water, mind, noise), ads, technology abuse, poaching, separation

**Class derived envisioned sustainable future (March 26):** Flourishing biodiversity, clean air, land, water, mind, noise, energy, less oil use, clean trashcans, sharing the earth, respecting natural resources, three R’s in use!, interdependence supported, decomposable products, end to extinction, forest and nature growth, equally distributed resources, less resource use, healthy consumption, less packaging, controlled waste, acceptance, open-mindedness, healthy/sustainable mindset, balance, clean water, awareness.
Bibliography


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