

Learning to Live Sustainably through a Kindergartener's Eyes

Jennifer LeBar Caenepeel

“Everyone thinks of changing the world, but no one thinks of changing himself,” Tolstoy.¹ What if we can find a way to educate youth around the world so that instead of *changing* to be better to the environment, we are just simply better?

“Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has,” Margaret Mead.² Why not begin with the youngest of minds, so that small group of excited learners can teach and lead by example as they grow?

I, like many human beings, have had a natural curiosity since childhood about the environment in which I live. I have been interested to learn about and find ways to better serve and aid the environment which we depend on. I, like many, have also lacked the knowledge and conviction to actually do something about my curiosities. I, like many, am a big supporter of throwing away one's waste, turning off the lights, carpooling when possible, saving leftovers for a second meal, and I try to abide by the “three R's”: reduce, reuse recycle. Now that I am an independent, self-sufficient, waste producing member of society, I feel an increased responsibility to focus more on my personal effects on the environment (positive and negative). I fear that I have learned to take the planet and its gifts for granted. In fact, based on the ecological footprint calculator provided by the Center for Sustainable Economy³, if everyone on the planet lived my lifestyle, we would need 5.22 Earths! That was a shocking number to me, as I thought I was relatively economical with my decision making; however, after utilizing a few different online calculators, I realized I am not making choices to live as sustainable as I thought. Each of my consumption categories was slightly less than the country average, but still quite high, considering the fact that we only have one earth to live on!

Having studied biology in college, and now being a kindergarten teacher, I also feel a responsibility to begin to educate my young students on ways to become more sustainable, in hopes that this idea will be something they will take pride in and carry throughout their lives. Clearly, five year olds will lack a great deal of background knowledge regarding environmental sustainability, and they will not be ready to understand most of the science behind how the environment works (and how we live/interact within it), but the basic concept of environmental concern is something that can be taught to kindergarten students, particularly from an empathetic view point, if nothing else. Most young students begin to develop a natural empathy for others, and getting them to understand that human beings can feel empathy and concern for the environment in which we live may help students focus more on this pressing issue as they grow older. Kindergarteners also understand things and process information from a very egocentric

perspective⁴, so getting them to understand that, “if I do this...then I can/cannot do/have this,” may help them to understand basic choices regarding environmental sustainability.

Demographics

I will teach this unit in a kindergarten class of 23 students. Our school’s population is approximately 570 students: 50% White, 30% Black, 15% Hispanic, and 5% other. The majority of our families fall within the low, middle, and middle/high socio-economic range. We are almost 40% free and reduced lunch, and that number continues to increase. The majority of my students come from households where all adults work, and many do not have parents at home to assist with involved projects. This lack of parental involvement has influenced some of my project choices for my students. My school has just celebrated its 50th anniversary in an established neighborhood and land is a large part of our campus. The “backyard” of the school encompasses four baseball fields, four playgrounds, and over an acre of additional “green” space. In addition, we have two green courtyard areas in the center of the school. Students are constantly exposed to, and interact within this green space, and it therefore can serve as an effective outdoor learning space.

My school’s diversity is increased due to the International Baccalaureate (IB) Magnet Program, as well as bussing from low-income apartment housing. Our teacher assistant population has decreased and the kindergarten team has been given 1 assistant to share among 5 classes, making large group projects difficult to plan and sustain. Students performing below grade level expectations on district mandated literacy assessments are required to be pulled out for intervention 40-60 minutes every day. We are required to teach the state standards, but were authorized as an IB World school in 2008, requiring us to teach 6 IB transdisciplinary units incorporating required state standards. Throughout each unit, students learn how to become a more involved and aware global citizen. We have limited technology resources, as we have a computer lab, but do not have a technology teacher, limiting the Internet resources available for use in teaching this unit.

Rationale

Since becoming authorized as an International Baccalaureate (IB) school, our focus as a school has shifted from teaching for and meeting the state/district standards to teaching students how to be better learners through the inquiry process. Of course, we do still have to teach local objectives, but we have been granted “freedom and flexibility” to modify, plan, and implement instruction as necessary to coincide with the IB philosophy. We place great focus on one’s impact on the world around us. The International Baccalaureate Organization states that, “Students in the 21st century are faced with the challenge of learning about an interconnected world where knowledge is constantly developing. The International Baccalaureate® (IB) Primary Years Programme prepares students to be active participants in a lifelong journey of learning.”⁵ The Primary Years Programme (PYP) is designed for students age 3 through 12 and

focuses on the development of the whole child as an inquirer, in the classroom and in the outside world. The topic of environmental sustainability ties in perfectly with what we try to teach our students through the PYP. The six IB units are centered around the following themes: who we are; where we are in place and time; how we organize ourselves; sharing the planet; how the world works; how we express ourselves.⁶ Developing an appreciation for the environment helps students to become more involved members of the global community. We focus on how to understand others, appreciate differences, and learn how to become a global citizen. I plan to incorporate environmental sustainability into this general IB philosophy. I hope that through this unit, my students will develop the desire to help the environment, prevent or manage waste appropriately, and take pride in maintaining a healthy environment in which they live and learn. I also hope that my students will take their new knowledge about the environment home, get their families involved, and share with the class something new that they are doing at home to increase their family's environmental sustainability. Young students have a natural curiosity for the world around them, and I hope to draw that curiosity out by incorporating inquiry based activities throughout the unit. Young students also love to teach others and share their knowledge. I hope to encourage and excite my students to share their new knowledge of living more sustainably with those with whom they interact.

Objectives

I will begin the school year utilizing two of the kindergarten IB themes, "Who We Are," where we focus on understanding ourselves: how we feel, what we like/dislike, how we act, who our friends, family, etc are; and "How We Organize Ourselves," where we focus on how the school is organized: responsibilities, personnel, expectations, schedules. Once these units are complete, I will begin implementing my unit on environmental sustainability. Students will have had an opportunity to explore themselves, their responsibilities, and their roles in family, friendships, and school. Therefore, it will be a good time to introduce how they can use those responsibilities and roles to help the environment. I will incorporate a great deal of age appropriate literature. I will incorporate dramatic play/role play where students will act out different situations and I will facilitate class discussions on appropriate actions. I will also incorporate family projects, where students have to talk to their families and take the issue of sustainability home and then report back to the class how they are helping to make small changes in their own households. In addition, I will involve the class in a garden project, where they will learn the basics about where food comes from, how plants grow and how we can become more sustainable by growing some of our own foods. My students will educate other students in the school through the use of grade level buddies (we partner with a third grade class). I want students to be able to make positive decisions regarding recycling, reusing, reducing, and consuming. I also want students to further develop and explain their thoughts and feelings about the earth and how important it is for us to take care of it. I want students to understand where products come from and how much energy it takes to produce goods. I want students to be able to describe personal choices they are making at home, along with their families, to live more sustainably.

Background

“You must be the change you wish to see in the world.” Mahatma Gandhi ⁷

“We forget that the water cycle and the life cycle are one.” Jacques-Yves Cousteau ⁸

“Forests are the lungs of our land.” Franklin D. Roosevelt ⁹

“We are living on this planet as if we had another one to go to.” Terri Swearingen ¹⁰

“Going green” has become quite a catchy topic thrown about effortlessly via social and media outlets. To the average consumer, like myself, I assumed that being “green” meant that you might purchase new light bulbs, unplug the computer, turn down the air conditioning and raise the thermostat for heat. What does this really mean, what does it really matter, and is it really “going green”? Sure, I can do those things. Heck, I’ll even carpool if it’s convenient; almost overfill my laundry loads; completely fill the dishwasher before running. And oh yeah, we can drive the small car on road trips! I can’t forget my “green” friends who have tried to use cloth diapers and take the light rail to work. I thought I was a step ahead when I planted the spring garden. However, when I think about how much energy I used to research the building, planting, and harvesting; how much paper was wasted to print my findings and purchase books on gardening; how much water was wasted as we dragged out the leaking hose across the yard every other day, I begin to wonder...do these things really make a difference in my household’s environmental sustainability, or in our carbon footprint? “Going green” is often publicized in the media from celebrities as well. For example, Natalie Portman and Kyra Sedgwick have filmed a short video available on the National Geographic website advertising the positive effects of compact florescent light bulbs (CFLs), claiming dramatic outcomes if everyone in America simply utilized one more CLF than what they currently have. The claim is that if everyone in America uses “one bulb” it will reduce global warming, would be the equivalent of taking one million cars off the road for over a year, and would save one thousand pounds of carbon dioxide greenhouse emissions from being released into the atmosphere.¹¹ Those claims are incredible, but it makes me wonder if it is accurate, and if so, what else can we do?

I must believe that I am making a difference. Simply becoming conscious of these choices makes me a better environmental citizen...but, can’t I do more? Sure. We all can. It just takes a huge commitment and the willingness to be a little different from the societal norms and a willingness to give up some of Western civilization’s highly celebrated advances and privileges. It also requires the ability to comprehend and understand how negatively we are impacting the single world which we depend on for sustainability. The mindset and thought processes behind many basic levels of decision-making must be analyzed, explained and altered in order to begin the change to a more sustainable society. Western society must change from thinking that the Earth is our possession and it will take care of us; we must understand that it is our responsibility

to take care of Earth. If we don't, we will ruin this precious gift and ruin future generations' ability to live a healthy, secure and sustainable life.

Understanding the numbers related to human consumption can be quite overwhelming. There are six and a half billion people on Earth using 33 billion tons of oil per year with an annual global domestic product of over \$25 trillion.¹² Big numbers, lots of people, incredible amounts of money. Scientists are just beginning to understand how all of this impacts our environment. It is even less understood how we can begin to reverse all of the environmental problems and how humanity will be impacted.

As an elementary school teacher, I was shocked and horrified to learn that just three years ago, 54 percent of the 10.8 million deaths per year of children under the age of five were caused by severe malnutrition (directly and indirectly).¹³ Exactly how much energy and water are used was another astonishing revelation. According to Dodds, 13 percent of the world's population (developed nations of United States, Canada, and Western Europe), use 48 percent of the available energy in the world.¹⁴ In analyzing the water use rates of people living in the United States, if the standard of living rose and everyone in the world used the same amount of water as American citizens, we would use all of the water temporally and geographically accessible on Earth.¹⁵ This does not take into account the increased water usage in agriculture and industry if the entire world's standard of living were to rise.

With human population growing exponentially since before the industrial revolution and the domestication of plants and animals, it is imperative to begin educating children at a young age so that they are able to implement some of the changes necessary to help our Earth recover from the intense stress that we place on it. The population of developed countries (such as the United States, Canada, and Western Europe)¹⁶ has slowed; however the population of underdeveloped nations is expected to continue to increase exponentially for the next century. Continued increase in population will certainly test the carrying capacity of the Earth. Without change from an ecological, political and environmental standpoint, the ability of the Earth to sustain life could become questionable.

Examining the choices that humans in developed countries make and why they make them could be key to identifying the changes that need to occur and how those changes need to be implemented. Sociobiology is a field where scientists not only examine the biological changes occurring in the environment, but they attempt to examine and explain why humans are making choices that knowingly harm the environment.¹⁷ As proposed by Walter Dodds, the prominent traits influencing harmful human interactions with the biosphere can be summed up in four main ideas: a drive to reproduce; a need to control physical and biological surroundings to improve survival and comfort; a desire to display accumulation and consumption of resources; and a tendency to cooperate with only closely related individuals.¹⁸ Both genetics and learned behaviors influence human choices to sustain those ideas, but the difference between genetic traits and learned behaviors influences how easily certain behaviors could be altered. Behaviors

that are learned and influenced primarily by culture will be easier to modify than behaviors that are a result of one's genetic code. If we begin to influence and educate young students so that they do not develop the negative learned behaviors that harm the environment, change will be easier in years to come. However, that will take sacrifice from those of us accustomed to the luxuries of modern, developed society.

Certainly, there are regulations and laws that force people to behave certain ways. There are many environmentalists and scientists working hard to come up with solutions to our environmental problems. A number of laws and acts have been put in place since 1964 that were implemented with the purpose of helping "save" the environment and push the environmental movement into action (Clean Water Act, Clean Air Act, Endangered Species Act, Montreal Protocol, and the establishment of the Environmental Protection Agency, to name a few). Many other countries have similar environmental laws. In addition, the publication of Rachel Carson's Silent Spring in 1962 helped launch the environmental movement.¹⁹ Still, global society is a long way from implementing enough changes to begin to reverse negative effects. However, if we begin with education, change will be much more likely to happen.

It also seems that some ideas presented to the general public via media outlets may not always be the best alternatives when it comes to better utilizing or saving resources. For example, using ethanol as an environmentally friendly fuel recently rose to the forefront in media outlets. Sure, why not use corn instead of oil to produce energy? What was not clearly conveyed however is that it takes a great deal of energy and resources to produce the corn and convert it to ethanol. Therefore, the product is not as environmentally friendly as it may seem. The United States' entire corn crop would only produce enough ethanol equivalent to two percent of the oil used annually in the United States. Two percent! Some researchers expect that it might actually require more energy to produce ethanol than the energy that ethanol is able to create (taking into account the fertilizer, machinery, transportation and refinery).²⁰

The amount of research and literature about living more sustainably is a bit overwhelming, but at the same time fantastic (see Lester Brown's Plan B 4.0, Mobilizing to Save Civilization)! It is great to see an increasing number people involved in educating others about how to live more sustainably. Now we need to begin at the youngest level so that living sustainably becomes an expectation, not a choice, and not the exception.

Strategies

Since I plan to incorporate portions of the unit throughout the year during each of our IB units, I will utilize many different strategies to help students understand various concepts of how to live more sustainably. Some strategies and activities will be ongoing throughout the year, but the majority of the unit will take place during our IB unit with the transdisciplinary theme of "sharing the planet."

One strategy that I will use to teach the concept of reusing materials is to create a recycled book store in the classroom. Each child will be assigned a specific date and on that date each month, they may bring a book from home (NOT new), put it in the bookstore and choose a book that is new to them from the bookstore. I will begin the store with about ten books of my own so that there will be a good selection from which students can choose. If a student does not have the resources to bring a book from home, I will supply them with a book so that they may still visit the store each month. Hopefully by creating the book store, students will get excited about reusing materials and understand that we do not always have to purchase new goods. There are many valuable resources that we can use and appreciate that do not have to be purchased new. I also hope that students will gain the understanding that they do not have to throw away their old or unused items. I want students to understand that they can donate items to people who may not have as much, or they can simply trade items with others rather than purchasing new goods.

I will also utilize a program from Scholastic in conjunction with Duke Energy (our local power provider), called "Power in Energy." The program uses Clifford the Big Red Dog to help teach students about energy conservation and use of resources. Students will take information home and complete a family survey related to home energy use. By submitting the survey, families will receive a free energy efficiency kit with materials that they can put to use in their home.

Students will begin to learn about the needs of plants through part of our science curriculum and we will research what a garden needs and how to create a garden. Students will then work together to design a garden to be planted in the spring. I will incorporate art into this design project as well. Students will work in cooperative groups to draw and paint a picture of what they think the garden should look like. As a class, we will work together to care for the garden. I hope to have some parent volunteers help harvest, as we will likely not be able to eat the food at school (due to local cafeteria and health regulations), but parents can take produce home to eat and enjoy.

Throughout my IB unit related to sharing the planet, students take an inquiry into how human behaviors affect ocean life: How do oceans help us? How do humans affect animal life? How do animals interact to survive? During this unit, we will briefly discuss water and how we can help keep our water clean (ocean, river, lake, pond, etc.). Students will be exposed to an oil spill experiment and information on how to recycle. Students will work with buddies from a higher grade to create posters showing how humans can help the environment. Throughout this IB unit, I will implement a large portion of my CU.

I also plan to incorporate as much technology as possible. I will utilize the EPA Environmental Kids Club website: <http://www.epa.gov/kids/> to enhance students' knowledge related to the following topics: plants and animals; garbage and recycling; you and your environment. I will also utilize a website related specifically to energy; being energy smart at home; and what renewable energy is: <http://www.eere.energy.gov/kids>. I will utilize the Energy Star kids website: http://www.energystar.gov/index.cfm?c=kids.kids_index and incorporate The

Lorax, by Dr. Seuss. We will use the SMART board in both small and large group settings to investigate and research Internet sources with the purpose of gaining knowledge on energy use.

My school already had a team in place that leads two campus beautification days each semester. I will publicize these events to my students and their families and encourage everyone to come help out and take a greater responsibility for our grounds. My school also has a recycle team in place that assists with distributing and emptying recycle bins each week. Once I have taught my students more about recycling, they will create posters to display around the school, encouraging good recycling habits. In addition, a small group of students will broadcast a message on the morning announcements. The entire school views our announcements each morning and I think that having kindergarten students convey such an important message may encourage the older students to follow our lead. One project I will get my students involved in is recycling in the cafeteria. So much waste is thrown away each day as nearly 600 humans eat in our building and there are no recycling receptacles in the cafeteria. My students will get involved in that process and explain to the school (via the morning news) that recycle receptacles will become a prominent fixture in the cafeteria and we need to utilize them. Our fifth grade students will be implementing a Capri Sun recycling program in the cafeteria, so we will work with them to create posters and encourage all students to participate.

In the spring, I will bring in the “worm man” who gives presentations to young students on how worms can help create compost. The “worm man” is a community member who visits youth groups and elementary school classrooms to explain and demonstrate how composting works.

As can be seen, I have many different strategies for teaching the basics of becoming more sustainable to my students (and hopefully to their families!). I will incorporate one or two lessons per IB unit and then teach a large chunk of my Curriculum Unit during my IB unit dealing with Sharing the Planet. I hope that by extending my unit over time, it will continue to reinforce important concepts about making good choices to help the environment. While it works best for me to spread out the lessons throughout the year, the lessons could also be taught altogether during a shorter time frame.

Activities and Lessons

Lesson One: This lesson occurs at the beginning of the year when students are learning about how schools are organized and how to show empathy to others at school.

Objective: students will identify and explain the term, environment. Students will explain and provide examples of how to show empathy toward the environment. We will begin general, ongoing conversations about how to help the environment.

Students view two Discovery Education videos, “The Blue Dragon: What a Waste!” and “Balltown: Environment.” Ask students follow up questions to engage them in conversation about the environment and to get a feel for the students’ prior knowledge.

Lesson Two: This lesson will be taught in conjunction with our social studies based IB unit, “Lean on Me,” where students identify and describe the people in their lives (friends, family, groups) and the relationships they have with those people.

Objective: students will make connections related to the IB unit identifying friends and family. Students will listen to a story and then write a letter/draw a picture telling someone why the Earth (or a specific part of the Earth) is their friend. Students will identify and verbalize how they can be a good friend to the Earth. Students will focus on adding detail to their pictures and sentences.

Students listen and respond to reading of Long Live Earth by Meighan Morrison. Students will participate in a discussion identifying and recalling various characteristics of the Earth, damage that has been done, and possible solutions to help reverse the damage (i.e. how they can be a good friend). Students will then work independently to write/draw about what they like about the Earth and how they can be a good friend to the Earth. Encourage students to focus on adding detail to their pictures and sentences, as well as use appropriate colors to depict the Earth.

Students will participate in a follow up lesson where they focus on adding more detail to their writing. The teacher will read The Earth and I by Frank Asch. Help students identify how the Earth is a friend and ask students to revise their previous writing to add detail to sentences and pictures.

Lesson Three: this lesson will be taught in conjunction with our social studies based IB unit, “Back to the Future,” where students are learning how the past affects our path for the future. Here we will begin a discussion of recycling.

Objective: Students will identify and explain the term, landfill. Students will identify ways to reduce the amount of waste going into a landfill.

Students will listen and respond to the reading, The Berenstain Bears, Don’t Pollute (Anymore). Students will work in small groups to plan a presentation to the class identifying one thing that humans used to do that hurt the environment and identifying one thing that we can now do to help the environment. Teachers will work with each small group to facilitate the discussion. Once students have shared their ideas, they will work in groups to create a poster to hang in the classroom that identifies how we can help the environment.

Lesson Four: This lesson will also take place during the “Back to the Future” unit. This will be a simulation-based lesson.

Objective: students will identify how to utilize less energy during the school day.

The teacher will conduct class either outside or in a classroom using natural light only. Students will spend the day (or a part of it, depending on available resources) using as little electricity as possible. This ties in with how people lived long ago. Students will use only white boards/chalk boards to complete their work, no computer/TV usage will occur. The teacher should encourage all students to pack their lunch so that they do not have to visit the cafeteria. The teacher should also encourage parents to send a lunch with as little waste as possible. The teacher will carry on with the normal lesson plans for the day, modifying as necessary to remove as much energy usage as possible. Students will reflect on their experiences via small group conversation and writing at the end of the day.

Lessons Five, Six, Seven, Eight, and Nine

The following lessons will occur during the IB unit focused on the theme, “Sharing the Planet.” Students will participate in a 5 week inquiry into the ocean and how human behaviors affect ocean life. We will look at various aspects of the ocean: animal life (types of, needs for survival, interdependent relationships), plant life (types of, needs for survival, interdependent relationships), water characteristics, human activities (good and bad), and geographical location. The objectives for the following lessons will be consistent: students will identify good and bad ways that humans influence ocean habitats and discover ways that humans can help ocean habitats. An in-depth look at recycling will allow students to identify what items can be recycled and the importance of doing so.

Lesson Five: the teacher will begin helping the students to brainstorm things that people do to harm the ocean (garbage, pollution, lights). Students will then participate in a “grab box” activity. The teacher will place a number of items in a box (plastic bag, soda rings, flashlight, toys, oil, etc.). When students pull an item out of the box, the teacher will encourage students to discuss reasons why they think the item could be harmful in the ocean. The teacher will facilitate as necessary to keep students engaged in productive conversation. Students will then choose one object to write on a note card to take home and share with their parents. Students will be expected to work with their parents to learn something new about how their object can help or hurt the ocean. Students will share their new knowledge with their classmates the following day.

Lesson Six: the teacher will ask students to bring in extra seashells from home. The teacher will then ask students what they think will happen if the seashells are placed in a glass jar and the class spends a few minutes each day shaking the jar (this will simulate how shells and rocks form sand in the ocean). The teacher will then show the students how they will shake the jar each day (recommendation: put glass jar in a large, sealed plastic bag in case it drops while being shaken; take jar out for recess each day and allow different students to shake each day). After a couple of days, students will begin to see that the shells begin to break down into sand particles. Ask students what they think will happen if plastic or glass is left with the shells and repeat the

experiment with some sort of plastic or glass (suggestion: small plastic toy, plastic bag). Students will see that it takes longer to form the sand particles and it will not look the same. Reinforce to students how important it is to recycle, reduce, reuse!

Lesson Seven: the teacher will read Where Does the Garbage Go? by Paul Showers. Following the reading, ask students to brainstorm ways that they can reduce their personal waste at home and also how the class can reduce its waste at school. After verbalizing their idea, each student will create a poster showing how they will reduce their waste (at home or school). The posters will then be displayed around the school and a few students will be invited to share their idea and poster on the morning announcements.

Lesson Eight: the teacher will read Recycle That! by Fay Robinson. The teacher will facilitate a discussion where students will begin to realize that we do not recycle as much as we could at school. Students will then write or draw (based on ability) to encourage others to begin to recycle more waste. Students will introduce (or re-introduce if already present) the recycling bins in the cafeteria. The teacher will assist a small group of students in filming a “commercial” encouraging recycling to be played following the morning news on closed-circuit television.

Lesson Nine: students will begin an inquiry project that will simulate an oil spill. The teacher will read part of the book, Oil Spill, by Melvin Berger. Stop reading prior to the discussion of how to clean up an oil spill. Encourage students to brainstorm/inquire into ways in which they might get oil out of the ocean. List the ideas for students and then narrow down 4 or 5 to test (suggestions: spoon, eye dropper, sponge, cotton ball, paper towel). Students will then participate in an experiment where they test each item to see which one gets more vegetable oil out of a fish tank. Students will use writing paper to create a science journal, designating one page for the question, “what will get the most oil out of the water?”; one for “research” (understanding that oil hurts ocean life); one page for their hypothesis; one for their materials; one for their procedure; one for their data/results; and one for their conclusion. Lead students through the scientific process. Split students into small groups during the experiment so that everyone has an opportunity to become fully engaged in the process. Students will then use their selected materials to see which object retrieves the most oil from the water. Allow students to try an object two times (simply for the sake of time) and “dump” their oil into a container designated for that object (example: have one small cup for each clean-up item). Once the students have used each item to clean up the oil, they will compare the amounts in each cup to determine which item worked the best. Finish reading the story and continue to discuss how oil is harmful for the ocean (and other habitats). Some helpful websites for this lesson and to give students a better base of knowledge in relation to the ocean: www.amnh.org, www.keeppoceansclean.org, www.discoveryeducation.com.

Lessons Ten and Eleven

The following lessons will occur during the IB unit focused on the theme, “How the World Works,” in which weather is the main topic. Throughout the unit, we discuss how weather affects the world around us. We take an inquiry into different activities that we can and cannot do depending on the weather, what types of clothes we wear based on the weather, how the weather makes us feel, what it looks like outside depending on the weather, etc. This unit takes place in the spring, so I will use the lessons to introduce students to how rain helps plants grow.

Lesson Ten: Objective: students will identify what the earth looks like where we live during the spring season. They will explain through verbal discussion, writing and group murals.

The teacher will read three easy-reader books with the students in small groups (Plant Parts by Amy Jo; What’s in the Soil? by Judy Nayer; and All Kinds of Plants by Linda Ross). The students will then be split into three small groups to read the books again with one another and present their new knowledge to the class. Students will then work in small groups to create a mural depicting what a garden looks like, incorporating appropriate colors, and common plants seen in the books. The teacher will bring students together to read the book, From Seed to Plant by Gail Gibbons. Students will gain further knowledge of how to plant a garden and what happens when seeds are planted and taken care of. The teacher will then assist students in planting a lima bean seed in a wet paper towel, placing it in a Ziploc bag and taping to the windows to allow sunlight to shine on the bag. Students will monitor the growth of the bean and record their daily observations in a journal.

Lesson Eleven: Objective: students will collaborate to make a list of materials necessary for planting a garden.

The teacher will begin the lesson by reading The Surprise Garden by Zoe Hall. The students will get to see how a garden grows and what wonderful plants can be found in a garden. The teacher will then help students list all of the materials necessary to plant a garden. The students will take home a letter asking parents for donations of items as well as parental help preparing the garden.

As a continuation of this lesson, students will work together to plant a garden (early spring) in the school courtyard. We will invite parents to come one day to help till/dig the land and then we will invite our 3rd grade buddies to help with the actual planting of seeds. Students will monitor the garden every 1-2 days, identifying if the soil is wet or dry (adding water as necessary) and once seeds begin to sprout, students will be grouped according to sections of the garden to represent, through drawing, the changes that they see taking place. We will work in small groups to weed the garden every 3-5 days. Once crops begin growing, the teacher will assist the students in harvesting.

Since the previous two lessons will be taught in conjunction with our IB unit focusing on weather, we will continue to discuss how weather affects plants and the environment. We will discuss what happens to the garden when it rains a lot, not at all, when sun is very present or when it is not, etc.

Lessons Twelve, Thirteen and Fourteen: three lesson summary of the CU.

Lesson Twelve Objective: students will identify and describe the waterfall effect of not treating the environment with care.

The teacher will read The Lorax by Dr. Seuss, facilitating continuous discussion about how harming one part of the environment leads to another. Following the lesson, the students will use writing paper to create their own mini part of the story. Students will choose one idea from the story to retell through pictures and words. They will then share their stories in small groups with one another. This lesson will take place the day prior to our third grade buddies' visit. When the third graders visit, we will re-read The Lorax with both classes. The third graders will then help the kindergartners create their own story about a different part of the environment. The students can choose any aspect of the environment to show what they think would happen if we do not treat it with care. The third grade buddies will assist the kindergarten students with the writing process and ideas for illustration.

Lesson Thirteen: This lesson will take place during our IB unit identifying how people around the world express themselves. Students will be given options for how they would like to express their new knowledge. This lesson will take place near the end of the school year and serve as a summative activity for students to express their new knowledge and understanding related to Earth, the environment, and ways in which we can become more sustainable.

Objective: students will identify three aspects (rivers, mountains, trees, etc.) of the Earth that are "good" and explain why they believe so. Students will identify (via drawing, writing, verbal expression) how they can help sustain those three aspects.

The teacher will read The Earth is Good by Michael DeMunn, and lead a discussion of how the Earth is good. The teacher will encourage discussion by asking students why they think these things are good. The teacher will also ask students what they think might happen if any of the "good" things from the book disappeared. Students will then work independently using a method of expression comfortable to them (drawing, painting, speaking, writing) to show three things about the Earth that they believe are good (from the story or not) and explain how they can help sustain those three things.

Lesson Fourteen Objective: students will identify one way in which they would like to try to make their presence on Earth more sustainable.

The teacher will read The Mountain that Loved a Bird by Alice McLerran. The teacher will facilitate a discussion about how the mountain changed over time, focusing on the single seed that was planted. The teacher will help the students to identify and list all of the changes on the mountain as a result of one bird and one seed. Encourage students to share their own ideas of how they can help make a difference and live more sustainably. The teacher will lead a review of all of the different aspects of sustainability that have been discussed throughout the unit, listing them on the board. Students will then choose one topic that they would like to focus on to describe how they can become more sustainable. The students will draw/write about that one topic in class. The students will then take their writing home, along with the teacher letter. Students will work with their family to create a project (poster, family plan, etc.) showing how their family can help them become more sustainable. Example: student wants to help save energy by turning off the lights. They may work with their family to create a plan for how the family will save energy at home by using energy efficient light bulbs, unplugging electronics, and turning the air conditioning up. The student will then present their project to the class.

Ongoing/Additional Activities:

Students will participate in the Recycled Book Store each month.

I will read excerpts from How Green Are You? By David Bellamy throughout the year during Morning Meetings.

Students will be invited to share (on their Recycled Book Store day) new ways that they are helping the environment at home.

Students and parents will be encouraged to utilize the provided websites at home. Students will be invited to share anything they learn at home with their classmates during morning meeting.

I will utilize multiple Discovery Education videos during times when we have indoor recess (due to weather) or cancelled special classes (due to teacher absences). Following each clip, I will facilitate a student discussion of the main idea, often utilizing the information provided on discoveryeducation.com.

I will utilize the SMART Board to introduce websites to students, hoping to stimulate their interest and encourage them to get their families involved at home.

The book Nature, Senses, Weather & Machines has many simple science experiments appropriate for this age.

Parents/Guardians of B-11,

On October 2, we will begin our classroom “Recycled Book Store.” I am involved in a voluntary program called the Charlotte Teachers Institute (in conjunction with the Yale National Initiative) and am a fellow in a course on Environmental Sustainability, led by a professor at Davidson College. Throughout the year, I will be writing and implementing a unit of study teaching kindergarten students some of the basic concepts of how to take care of our environment.

One of our projects will be a year-long “Recycled Book Store.” The purpose of the book store is to teach students that it can be beneficial and fun to recycle/reuse (i.e. we do not always have to purchase new goods!). Each student will be assigned a date and on that date each month, the student is invited to bring a gently used book from home to put in the “store” and in return, they will take home a book that is new to them. PLEASE do not send a brand new book with your student, as that defeats the purpose of the store! I will place the date in your child’s behavior folder to serve as a reminder. Visiting the book store will become a part of your child’s independent morning routine on his/her assigned day. If your child forgets on his/her assigned day, there will be a two day window where he/she may remember and still visit the store to exchange his/her book. If your child’s day falls on a weekend or holiday, he/she may visit the store on the day prior to or following the weekend/holiday.

I am excited to begin integrating my teaching unit! There may be other projects/activities that come home, and as always, I encourage you to share ways of saving resources and living more sustainably with your child!

Your child’s book store date each month will be:

Thank you! Feel free to contact me with any questions!

Mrs. Caenepeel jennifer.lebar@cms.k12.nc.us



Parents/Guardians of B-11,

Wow! It's hard to believe that spring will soon be in the air! I hope that everyone has had a wonderful winter and is ready for the weather and colors to soon change!

Our class, in conjunction with our third grade buddies, will soon begin planning and planting a spring garden. We will utilize a space within the school courtyard, but we need your help! If you would be willing to donate your time for tilling or any materials that we could use for the planting of our garden, it would be greatly appreciated. More information will come home in the coming weeks about when we will begin preparing the land, but we would love to begin collecting materials now!

Some ideas:

Topsoil, seeds (any relatively quick growing vegetable), watering cans, garden gloves, shovels, stakes/tags for marking plants, etc.

Anything that you could donate would be greatly appreciated. Thank you so much in advance and Happy Spring!

Mrs. Caenepeel's Kindergarten Class

Parents/Guardians of B-11, (for final lesson/project)

We have come to the conclusion of our year-long unit where your students have been learning about different ways that we can live more sustainably. Attached to this letter is a recent sample of your child's writing, where they have identified an area that they would like to work on at home. Please encourage this proactive behavior and help your child create a project or plan, identifying how you can incorporate this concept at home. The goal of this activity is to create a project (poster, family plan, etc.) showing how your family can become more sustainable. Example: student wants to help save energy by turning off the lights. They may work with their family to create a plan for how the family will save energy at home by using energy efficient light bulbs, unplugging electronics, and turning the air conditioning up. The student will then present their project to the class. These projects can be as involved or simple as you like, but I encourage you to be creative! Also, please have your child practice explaining their idea at home so that they are able to share when they come to school.

Thanks so much for your support!

Notes

- ¹ Marshall, Natalia. *Live an eco-friendly life: smart ways to get green and stay that way*. New York, NY: A Perigee Book, 2008, p. 2.
- ² Marshall, Natalia. *Live an eco-friendly life: smart ways to get green and stay that way*. New York, NY: A Perigee Book, 2008, p. 3
- ³ "Ecological Footprint Quiz by Center for Sustainable Economy." Ecological Footprint Quiz by Center for Sustainable Economy. <http://www.myfootprint.org> (accessed May 3, 2010).
- ⁴ McDevitt, Teresa M., and Jeanne Ellis Ormrod. *Child development: educating and working with children and adolescents*. 2nd ed. Upper Saddle River, N.J.: Pearson/Merrill Prentice Hall, 2004, pp. 147-148.
- ⁵ "The International Baccalaureate offers high quality programmes of international education to a worldwide community of schools." The International Baccalaureate offers high quality programmes of international education to a worldwide community of schools. <http://www.ibo.org> (accessed September 10, 2010).
- ⁶ "The International Baccalaureate offers high quality programmes of international education to a worldwide community of schools." The International Baccalaureate offers high quality programmes of international education to a worldwide community of schools. <http://www.ibo.org> (accessed September 10, 2010).
- ⁷ Marshall, Natalia. *Live an eco-friendly life: smart ways to get green and stay that way*. New York, NY: A Perigee Book, 2008, p. 4.
- ⁸ Marshall, Natalia. *Live an eco-friendly life: smart ways to get green and stay that way*. New York, NY: A Perigee Book, 2008, p. 13.
- ⁹ Marshall, Natalia. *Live an eco-friendly life: smart ways to get green and stay that way*. New York, NY: A Perigee Book, 2008, p. 74.
- ¹⁰ Marshall, Natalia. *Live an eco-friendly life: smart ways to get green and stay that way*. New York, NY: A Perigee Book, 2008, p. 63.
- ¹¹ National Geographic. "Video -- "This Bulb" -- National Geographic." Video -- Animals, Travel, Kids -- National Geographic. <http://video.nationalgeographic.com/video/player/environment/going-green-environment/conservation-in-action/this-bulb-ngv.html> (accessed November 28, 2010).

-
- ¹² Dodds, Walter K.. *Humanity's footprint: momentum, impact, and our global environment*. New York: Columbia University Press, 2008, pp. 3-4.
- ¹³ Dodds, Walter K.. *Humanity's footprint: momentum, impact, and our global environment*. New York: Columbia University Press, 2008, p. 6.
- ¹⁴ Dodds, Walter K.. *Humanity's footprint: momentum, impact, and our global environment*. New York: Columbia University Press, 2008, p. 142.
- ¹⁵ Dodds, Walter K.. *Humanity's footprint: momentum, impact, and our global environment*. New York: Columbia University Press, 2008, p. 143.
- ¹⁶ Dodds, Walter K.. *Humanity's footprint: momentum, impact, and our global environment*. New York: Columbia University Press, 2008, p. 16.
- ¹⁷ Dodds, Walter K.. *Humanity's footprint: momentum, impact, and our global environment*. New York: Columbia University Press, 2008, pp. 109-110.
- ¹⁸ Dodds, Walter K.. *Humanity's footprint: momentum, impact, and our global environment*. New York: Columbia University Press, 2008, p. 111.
- ¹⁹ "The Life and Legacy of Rachel Carson." The Life and Legacy of Rachel Carson. <http://www.rachelcarson.org> (accessed November 28, 2010).
- ²⁰ Dodds, Walter K.. *Humanity's footprint: momentum, impact, and our global environment*. New York: Columbia University Press, 2008, pp. 148-149.

Bibliography for Teachers

- Brown, Lester Russell. *Plan B 4.0: mobilizing to save civilization*. New York: W.W. Norton, 2009. Provides lots of information on changes that can be made to help live more sustainably.
- Dodds, Walter K.. *Humanity's footprint: momentum, impact, and our global environment*. New York: Columbia University Press, 2008. Provides information on many of the challenges that we face when trying to live more sustainably.
- "Ecological Footprint Quiz by Center for Sustainable Economy." Ecological Footprint Quiz by Center for Sustainable Economy. <http://www.myfootprint.org> (accessed May 3, 2010). Helpful tool to evaluate your ecological footprint-would be great to give to parents as well!
- "Keep Oceans Clean!" Keep Oceans Clean! <http://www.keeпоceansclean.org> (accessed June 7, 2010). Interactive website providing information for students and teachers on how to help keep the oceans clean.
- Lappé, Anna. *Diet for a hot planet: the climate crisis at the end of your fork and what you can do about it*. New York: Bloomsbury USA, 2010. Enjoyable and not terribly scientific about how our food choices affect our personal health and planet health.
- Levine, Shar, Leslie Johnstone, and Steve Harpster. *First science experiments with nature, senses, weather & machines*. New York: Main Street, 2005. Great resource for youth science projects (approximate ages 4-9). Kid friendly terms and relative easy to implement activities.
- Marshall, Natalia. *Live an eco-friendly life: smart ways to get green and stay that way*. New York, NY: A Perigee Book, 2008. Practical ideas for live more eco-friendly; from buying to growing to cleaning.
- McDevitt, Teresa M., and Jeanne Ellis Ormrod. *Child development: educating and working with children and adolescents*. 2nd ed. Upper Saddle River, N.J.: Pearson/Merrill Prentice Hall, 2004. Education textbook specifically about child development; quite easy to navigate.
- National Geographic. "Video -- "This Bulb" -- National Geographic." Video -- Animals, Travel, Kids -- National Geographic. <http://video.nationalgeographic.com/video/player/environment/going-green->

environment/conservation-in-action/this-bulb-ngv.html (accessed November 28, 2010). Interesting 90 second clip about the “power” of one CFL lightbulb.

Rogers, Peter. "Facing the freshwater crisis." *Scientific American*, August 2008.
<http://www.bio.davidson.edu/courses/cis171/readings/rogers2008.pdf> (accessed May 3, 2010). Interesting article about the demand, usage, irrigation and transportation of water around the world.

Ryan, Eric, Adam Lowry, and Rima A. Suqi. *Squeaky green: the Method guide to detoxing your home*. San Francisco, CA: Chronicle Books, 2008. Provides lots of solutions for keeping your home (or classroom) cleaner and “greener.”

"The Life and Legacy of Rachel Carson." The Life and Legacy of Rachel Carson.
<http://www.rachelcarson.org> (accessed November 28, 2010). Tells about the life and accomplishments of Rachel Carson, author of Silent Spring.

"Wasteonline recycling for householders information sheet." Waste Online Homepage.
<http://www.wasteonline.org.uk/resources/InformationSheets/HouseholdersRecycling.htm> (accessed October 21, 2010). Fact sheet providing information about household recycling. It is a British website, but much of the information can be transferred to the US.

"Welcome to Discovery Education." Welcome to Discovery Education.
<http://www.discoveryeducation.com> (accessed May 2, 2010). Fantastic website for educators with lots of education video and resources. Does require a password/subscription.

Student Reading List

Asch, Frank. *The Earth and I*. New York: Scholastic, 1997/1994. Colorful picture book about a child explaining his friendship with the earth.

Bellamy, David J., and Penny Dann. *How green are you?* New York, N.Y.: C. Potter/Publishers :, 1991. Fun facts for kids presented by a whale, discussing how to be more “green” at home, school, with transportation, etc. Teacher read-aloud due to higher level words.

Berenstain, Stan, and Jan Berenstain. *The Berenstain bears don't pollute (anymore)*. New York: Random House, 1991. Brother and Sister bear learn about the dangers of pollution and encourage the grown-ups to get involved.

Berger, Melvin, and Paul Mirocha. *Oil spill!* New York: HarperCollins, 1994. Very educational, yet age appropriate book about the Exxon-Valdez oil spill. Detailed descriptions of how

the spill happened and the attempts at cleaning it up.

DeMunn, Michael, and Jim McMullan. *The earth is good: a chant in praise of nature*. New York: Scholastic, 1999. Easy reader picture book discussing how the Earth is good. Excellent writing prompt due to large pictures and few words.

Gibbons, Gail. *From seed to plant*. New York: Holiday House, 1991. Picture book, yet scientific explanation of where seeds come from, how they grow, and what they produce.

Hall, Zoe, and Shari Halpern. *The surprise garden*. New York: Blue Sky Press, 1998. Picture book about children who plant many unknown seeds and end up with a lush vegetable garden after taking care of the garden.

Jo, Amy. *Plant parts*. New York: McGraw-Hill School Division/Macmillan McGraw-Hill, 2000. Easy reader describing parts of a plant.

McLerran, Alice, and Eric Carle. *The mountain that loved a bird*. Natick, MA: Picture Book Studio USA :, 1985. Picture book describing what happens over time after a seed is planted on a mountain.

Morrison, Meighan. *Long live earth*. New York: Scholastic Inc., 1993. Picture book/rhyme about the beauty of Earth.

Mott, Chapman, and Tessa Hill. *Amazing earth adventures: a kid's guide to preserving the planet*. New York: Scholastic Inc., 1992. Must be read aloud to this age, but lists many ways that kids can get involved to help save the planet.

Nayer, Judy, and David Hohn. *What's in the soil?* New York: McGraw-Hill School Division, 2000. Easy reader describing the components of soil.

Peet, Bill. *The wump world*. Boston: Houghton-Mifflin, 1970. Read aloud about “monsters” (humans) taking over the natural land on Earth, and the “wumps” (animals) who lost their habitats.

Robinson, Fay. *Recycle that!* Chicago: Childrens Press, 1995. Rookie reader, simple explanation of how recycling works.

Ross, Linda. *All kinds of plants*. New York: McGraw-Hill School Division/Macmillan McGraw-Hill, 2000. Easy reader describing different kinds of plants.

Rylant, Cynthia, and Mary Szilagyi. *This year's garden*. Scarsdale, N.Y.: Bradbury Press, 1984. Picture book showing how a garden changes throughout 12 months.

Seuss, Dr.. *The Lorax*. London: HarperCollins Children's Books, 2009. Popular picture book/rhyme about the waterfall affects of cutting down trees.

Showers, Paul, and Randy Chewning. *Where does the garbage go?* Rev. ed. New York, NY: HarperCollins Publishers, 1994. Very informative picture book about what happens when garbage leaves your house.

Websites for Teachers, Students, and Families

Each of the following websites contain lots of information for teachers, students and families. Many have links for students, but all would require adult assistance for kindergarten students.

"EERE: Kids Home Page." U.S. DOE Energy Efficiency and Renewable Energy (EERE) Home Page. <http://www.eere.energy.gov/kids/> (accessed November 30, 2010).

"ENERGY STAR KIDS." Home : ENERGY STAR. http://www.energystar.gov/index.cfm?c=kids.kids_index (accessed November 30, 2010).

"EPA Environmental Kids Club: Home Page." US Environmental Protection Agency. <http://www.epa.gov/kids/> (accessed November 30, 2010).

"Electric and Natural Gas Safety World." Duke Energy Safety Education. <http://www.dukesafety.com/schools/kids/landing2.html> (accessed November 30, 2010).

"Home | Duke Energy - Power in Energy." Residential - Duke Energy. <http://www.duke-energy.com/powerinenergy/> (accessed November 30, 2010).

"Individual Waste Reduction Model (iWARM) | Resource Conservation | US EPA." US Environmental Protection Agency. <http://www.epa.gov/osw/conserve/tools/iwarm/> (accessed November 30, 2010).

"Presentation Kits, Education Materials to Promote Sustainable Food - Sustainable Table." SustainableTable. <http://www.sustainabletable.org/spread/kits/> (accessed November 30, 2010).

Materials for Classroom Use

Computers

SMART Board

10 gently used books for the beginning of the Recycled Book Store

Recycling Receptacles for classroom and cafeteria use

Kindergarten writing paper

Pictures of uses for landfills (Lesson 3)

Large construction paper

Variety of writing utensils (pencils, crayons, markers, paint brushes, etc.)

Individual chalk boards/chalk for students (Lesson 4)

A large grab box with lid and garbage materials: ex. plastic bags, soda rings, broken toys, bottle caps, etc. (Lesson 5)

Notecards

Seashells and glass jar (Lesson 6)

Video camera (Lesson 8)

Large paper for group murals

Tools for gardening (seeds, shovels, topsoil, watering cans/hose, stakes for labels, etc.)

Fish tanks, vegetable oil, eye droppers, cotton balls, paper towels, spoons, shovels, etc. for oil spill experiment.