

## **What Do You Value? A Question to Guide Us Through the Sustainability Discussion**

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### **Rationale**

I initially began to research and write a unit to bring awareness and information to my third grade students regarding single use plastics such as straws, shopping bags, or take-out restaurant utensils. After they were presented with how these single use plastics impact the environment, my students would develop a position detailing their decision about their personal use of these items. Through the course of my research and planning, a different question began to enter my thoughts; “What do you value?”. Our choices have opportunity costs; Do I value convenience? Do I value forests? Do I value keeping plastics out of the world’s oceans? When discussing sustainability, everyone must decide what they value most and decide their course of action.

Third graders have a curiosity that keeps them engaged in authentic learning activities. This curriculum unit will help students tap into and develop their curiosity through guided lessons and inquiry based instruction. Making a connection to their own lives will help the students understand the topic more thoroughly as it will directly impact their lives. In order to help my students develop researching skills and formulate interesting, thought-provoking questions around the topic of sustainability, I will narrow the topic for them to include items that they encounter on a regular basis thus including my original idea of single use plastics. This unit will focus on plastic drinking straws and plastic shopping bags. Students will monitor their personal use of these items and then make decisions on whether or not they are interested in decreasing their use of these items.

I have heard the reduce, reuse, recycle tag line for many years now and I’d like to think that in my classroom, and at home, choices are made that are respectful to the environment. One way we reduce our waste in the classroom is by displaying student work and assignments onto the projector screen instead of making copies for each student. I personally have energy efficient appliances that have the selling point that they reduce the amount of energy I use. Many papers that come into our classroom have printing on only one side, we place these papers into our scrap bin and reuse the blank side for drawing or other activities. Our school nurse is always in need of bags to send home dirty clothes, so I bring her old shopping bags so they can be reused. In our classroom we have a recycling container for our paper waste and in the cafeteria, students drain their plastic milk container and place the empty milk containers into a separate bin. At home, I recycle my glass, paper, and some plastics. We go through our days believing that we are making good choices and helping the environment, but are we? As we progress through this unit, students will research to discover the impact single use plastics

have on the environment. Students will brainstorm ways to reduce, reuse, and recycle these single use plastic items.

## **Objectives**

The students in my class will develop a research project and create a presentation in which they form a personal stance deciding to use or not use a specific single use plastic item. As a class we will begin investigating straws and plastic shopping bags, students can decide to continue and expand on our initial discussions or they can choose another single use plastic item that is important to them. Students will develop reasons to support their stance and determine the impact their stance will have on the environment. When the presentations are completed, students will present their finding and decisions to the rest of the class and their families. This curriculum unit, even though steeped in science topics, will focus on third grade English Language Arts standards. Students will conduct a short research project that builds knowledge about the topic of single use plastics and the impact these items have on the environment. Students will introduce the topic, create a personal stance and state their opinion, then create an organizational structure that uses temporal words and presents supporting details. Students will report on this topic with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. At the conclusion of the projects, students will then create an audio or video Public Service Announcement, (PSA) related to their research.

## **Demographics**

The Red Clay Consolidated School District is the largest school district in Delaware and is located in northern New Castle County. This district has a combination of schools situated in both urban and suburban settings. Red Clay is comprised of 29 schools, serving approximately 17,000 students. The racial composition is described 42% White, 30% African American, 18% are described as Hispanic and 4% Asian. The needs of the student population are varied and almost 16% of the student body receive a Special Education classification. The socio-economic classifications are diverse with about 28% classified as coming from low socio-economic households.<sup>1</sup>

I am a third grade teacher at Highlands Elementary in the Red Clay Consolidated School District. My school is located in an urban setting in Delaware's largest city, Wilmington. We have an average yearly enrollment of just over 300 students each year. Highlands instructs students in Kindergarten through Fifth grade. I am the principal educator of about 20-24 students each year. Instruction is differentiated to meet the diverse needs of my students.

Our district is a one-to-one technology district. Every student in my class has a Chromebook to use daily. These chromebooks remain in the classroom however, students

and parents have family codes to access the programs and resources the students utilize through the instructional day while at home.

## **Sustainability**

What does it mean when we talk about sustainability? There are many differing variations of the term. One explanation that helped me sort through the concept is; “enduring into the long-term future; it refers to systems and processes that are able to operate and persist on their own over long periods of time.”<sup>2</sup> So why is this important? Explaining to my students the importance of making sure that we think about our actions today and how they will affect the planet in the future is crucial to helping them realize there is a need to maintain the environment without negatively impacting our food sources, where we live, our weather patterns, and a myriad of other issues. On our planet; Earth, there is an interconnectedness that enables humans to live alongside other species. We as humans should work to develop systems that provide good stewardship of this biosphere.

## **Refuse, Reduce, Reuse, Recycle**

### Refuse

I was familiar with the reduce, reuse, recycle slogan but through my research and conversations with other Fellows, I was introduced to the fact that this slogan has been updated. There are a few variations: The 5 R's: Refuse, Reduce, Reuse or Repair, Recycle, Rot.<sup>3</sup> The 6 R's: Rethink, Refuse, Reduce, Reuse, Recycle, and Replace.<sup>4</sup> Trying to keep my students in mind and keep things simple, I've settled into this one Refuse, Reduce, Reuse, Recycle.<sup>5</sup> Refusing simply means learning to say no. You can refuse to take things, to purchase new items, or to use products that could be harmful to the environment. Instead of accepting a straw with your drink, just say no. In the grocery store you can buy vegetables in the natural form, not pre-sliced and pre-packaged in plastic wrap. Phones have helped to make things more convenient, when you are presented with a personal business card, a pamphlet or flyer, or take-out menus, use your phone to take a picture instead and refuse the paper. There are many other ways to participate in the refuse strategy; go paperless with your bills and pay them on-line, refuse a bag when you only have a few items at the store, refuse the plastic one-use utensils when you are bringing your takeout food home and use your own flatware. Think about your purchases and let the question, “Do I need this?” help guide your purchases.

### Reduce

Reduce is the next word in the slogan. This reminds us to think of ways that we can reduce our use of and dependence on single use plastic items as well as other resources. I have a friend who carries a steel straw in her purse and uses it each time she orders a

drink when she is out; she is reducing her usage of straws. Some people have the ability to walk to the store or a restaurant, this enables them to reduce their car usage thus reducing gasoline usage and reducing emissions. When at the grocery store, in order to reduce the usage of plastic packaging and bags, consider leaving your fruits and vegetables loose and not placing them into a small plastic bag. This may be less convenient but it will help to reduce the amount of single use plastic bags entering the waste stream and landfills, becoming litter on the side of the road, or ending up in our streams or oceans.

## Reuse

The third word in this slogan is reuse. Instead of discarding something after its initial use, reuse it for an alternative purpose. When we reuse items for functions other than their original purpose, we are then able to keep them out of the landfill.

My grandparents and parents were experts in this area. I remember my grandmother washing out the bag the bread came in and reusing it in a variety of different ways such as a bag for my grandfather's sandwich for lunch the next day or to put inside our snow boots to help keep our feet dry. I also have memories of excitedly reaching in to grab the whipped topping container to add some whipped goodness to my ice cream only to realize that it instead contained leftover lima beans from last night's dinner. Another memory involves wrapping paper and bows. We were always instructed to be very careful in unwrapping our presents and not tear the paper so my mother could use it again for another holiday or siblings' birthday and not to crush the bows so they too could be reused.

Bottled water consumption adds to the waste stream. One source reported that globally, humans buy a million plastic bottles per minute.<sup>6</sup> Choosing a reusable water bottle would be one way to help reduce the number of disposable water bottles ending up in landfills and oceans.

## Recycle

The final piece of our slogan revolves around recycling. Recycling involves collecting certain items and instead of sending them to a landfill, the items are sent to special processing plants that can turn these items into new products. Again, taking a trip down memory lane, I can remember bundling our old newspapers with twine and once a month we put them out at the curb to be collected. Now I recycle more than old newspapers and since I live in the City of Wilmington, collection happens once a week. On the Delaware Solid Waste Authority website, there are detailed lists of things that can be recycled and things that cannot be recycled.<sup>7</sup> Making sure that we separate our garbage from our recyclables helps lower the amount of garbage ending up in the landfill.

## Recycling Plastics

“The Average American tosses seven-and-a-half pounds of garbage each and every day, more than 2,700 pounds per person a year ends up in a landfill.”<sup>8</sup> Recently a class field trip to the Delaware Recycling Center made us aware that not all things placed into the recycling bin end up being recycled. Recyclables that arrive at the center inside of plastic bags are sorted out and sent to the landfill. The reasoning for this is to protect the workers. It was stated that it is unsafe to try to open the bags and empty them and then dispose of the plastic bag. I have now convinced my family and friends to only place loose recyclables into their recycling bins. With around 75% of households in the United States participating in some type of recycling, some studies show that 75% of the plastic still ends up in landfills.<sup>9</sup> Many reasons lead to plastics not being able to be recycled such as low quality plastic, contamination, volume, and insufficient or inadequate plastic recycling facilities.<sup>10</sup>

### Opportunity Costs: What do you value?

Everyone makes many choices every day: shower or bath, eggs or cereal, walk or drive to work, grab a bottle of water or use a reusable container, bring a bag to the store or use a plastic bag from the store, using a plastic straw or drinking from the glass. Thinking about what you value influences your decisions. Do I value convenience? Then a single-use water bottle would be a good choice, as it's easy to transport, lightweight, and when I am through with the water, I toss the bottle into recycling. Do I value producing less waste? My choice would be to use a reusable water bottle and then when I return home I will clean it out and reuse it again the next day. Each choice gives us a benefit yet other benefits may be lost; these are the opportunity costs of your decisions. Each of our choices has an impact on our environment and we must decide what type of impact we are willing to have.

### *Paper or Plastic?*

I can remember in the late 1980's while I was working at a grocery store, the store was making the change from all paper bags to paper and plastic, and asking the question, “Paper or plastic?”, multiple times throughout my shift. At that time, I thought plastic was a solution to our stripping the planet of so many trees. I was aware that there were pros and cons to either choice but was swayed by the company that preferred the plastic bags. I am not certain why at that time they were pushing us toward the plastic bag choice, but I could guess that it was a financial decision. The paper bags could hold more groceries and were sturdier but the plastic bags were easier to carry with their handles and took up less room in the bagging area. Now over 30 years later, I find myself asking, “Was it truly a better solution?” Well we return to the question, “What do you value?”

Let's break down our options. Plastic bags certainly are convenient. I can carry many bags at once as I am unloading the car. Additionally, plastic bags can be reused. Yet sometimes I open my trunk and some of my groceries have escaped this convenient little package and I have to round up the apples or other items and re-bag them. Once I get them inside, as I put my packages down, again things scatter across the floor. I also have this little voice inside me telling me that this plastic bag will remain on our planet for many years. Plastic bags can take anywhere from 10 to 1,000 years to decompose.<sup>11</sup> Ugh! So, I could choose paper, they do hold more groceries so I don't use as many bags. My groceries remain inside my bag through the entire journey. I can reuse the paper bags too. Paper bags can decompose in two to six weeks or can be recycled.<sup>12</sup> It seems that both choices have advantages and disadvantages, so it comes back to what you value? Paper, even though it may seem like a greener solution since it can decompose quicker than plastic, still creates pollution during its production, specifically 70% more air pollution than plastic.<sup>13</sup> "Making paper bags uses trees that, instead could be absorbing carbon dioxide."<sup>14</sup> Additionally, producing paper bags can add up to 50 times more pollutants into the water system than making plastic bags.<sup>15</sup> Plastic is lightweight and can get carried away by the wind, adding to the roadside, riverbed, and ocean litter.

## **Teaching Strategies**

### **Inquiry**

My goal is to create lessons that will engage my students and turn them into active learners. I constantly work to make sure my students are connected to their learning and are developing an inquiry mindset. Inquiry learning enables students to seek knowledge and understanding through questioning. Anyone who has spent time with a toddler knows they are experts at questioning, yet something happens to these naturally inquisitive students as they reach third grade. Students are more self-conscious about their limitations and are reluctant to take risks by letting everyone know they do not know something by asking a question.

When participating in an inquiry based classroom, students see themselves as researchers. They look forward to discovering new facts and develop a curiosity that pushes them forward in their learning. In an inquiry based classroom, students work to develop the questions they will seek answers to, organizing the research, and analyzing the information to determine if their questions have been answered. Students become comfortable with the understanding that one answer may lead to even more questions.

In order to include improved inquiry in my classroom in a scaffolded, structured way, I will be utilizing three forms of inquiry based instruction; structured, guided, and open inquiry. The goal is to get students to make observations and then propose descriptions and justifications of what they observed. Beginning with structured inquiry will enable my students to have the process modeled and still feel supported by me. In this model, I

will provide my students with hands-on activities, will detail the procedures they should follow, and will supply the materials needed for the investigation. I will not give the students any expectations for the results. The students may feel unsure of themselves and will constantly check with me to make sure they are "doing it right". This is okay and I will provide support but no answers! This will help to highlight that they are looking to develop questions about what they are experiencing. As the lessons progress, we will move toward guided inquiry. Here the students will be given more freedom over the exploration and will be provided with materials and a question or problem they will need to investigate. The students will be responsible for developing the procedures they will follow. Since students are creating their path, there should be fewer calls for direction, well at least that's the plan! When the students have begun to feel comfortable taking a more active part in the development of a personal learning plan I will move to an open inquiry opportunity. During this type of inquiry students will create their own plan for an investigation. They will develop the topic, the procedure, and the questions they will answer through their investigation. This will enable students to explore areas of study that interests them and build a personal connection to science.

### Thin-Thick Questions

Students do ask questions, yet those questions usually involve permission to go to the bathroom or clarification on the directions. When students need to ask questions to gain information on a particular topic, they will usually ask very basic yes/no questions. Using a thin-thick questioning strategy helps students learn to ask questions that will lead to the details and understanding they are seeking. We begin with a picture that I do not show students; I usually draw a picture using a combination of basic shapes and colors. The end goal is to have the students reproduce the picture without seeing it, only asking questions. We begin as a whole class. They are told they can ask 10 questions. This first round, the questions are very basic and the students become frustrated because they realize they do not have enough information to draw a complete picture. I do not yet reveal the picture. I then provide instruction in asking better questions, explaining the difference between close and open ended questions. During the second round, students can only ask 5 questions. The questions become more complex and they learn to ask detailed questions. The students then again draw what they think is in the picture. We begin to apply this strategy in order to obtain more information from the stories we read, interviews we hold, and investigations we develop. As we work through the year, we strive to ask thick questions in order to become better learners.

### Word Sorts

An important strategy implemented in this unit will be the use of word sorts. Word sorts are a hands-on instructional tool used to teach vocabulary. When students come from low socio-economic backgrounds, such as my students, they are lacking in vocabulary and need explicit instruction, as well as, a variety of modalities to build their vocabulary,

especially with content focused and scientific words. Words or pictures can be categorized based on pre-determined labels. Word sorts enable students to compare and contrast items through a variety of criteria. Students use reasoning skills to categorize and discover patterns that they can later apply to unknown words they encounter. This activity is very easily leveled to meet the needs of the diverse learners in my classroom.

Vocabulary instruction will be enhanced not only through word sorts in which students will be able to develop the criteria for sorting, but also through picture sorts. Students will use magazines, images, or make drawings to illustrate examples of the vocabulary words and use the illustrations along with the written word to make deeper connections.

### Cooperative Learning

Cooperative Learning is a successful teaching strategy in which teams of learners of varied abilities and interest come together to help each other to improve their understanding of the subject matter. Cooperative Learning is used to promote student learning and retention of material, foster positive social relationships within the classroom community, and enhance student satisfaction with the learning experience. The following are examples of a variety of cooperative learning activities that I will make use of throughout this unit.

#### *Jigsaw*

This activity is useful when the workload is larger and can be divided up. Groups of three to five students are formed and the text is broken up into smaller chunks. Each member of the group is assigned a different small chunk to learn independently. The group then reassembles and each separate member serves as an expert on the portion they have learned as they become the expert. When the students are beginning their research on sustainability and recycling, a preliminary information packet or non-fiction book will be useful to help guide their learning. As an example, during the initial phase of research, students can be divided into small groups and each member will become the "expert" on smaller parts of the larger topic regarding the recycling process. Students will then have some valuable information pertinent to their research and will feel confident as they begin to put the pieces together with their group members.

#### *Think-Pair-Share*

This approach involves three steps. During step one, students "think" silently about the topic or a question about the topic. After a pre-determined time-frame, generally one to two minutes, students "pair" up and discuss their thoughts or responses on the topic. After another minute or two, students "share" their thoughts or response with other "pairs" or



the entire group. Informal assessments are key to checking for understanding and a good way to accomplish this is to pose higher order thinking questions at the end of a daily lesson. A question will be posed by me and the students will answer the question using this method. Participating in this activity helps students analyze and evaluate their learning as well as clear up confusion or misconceptions in a non-threatening way as they answer a daily question in smaller less threatening groups.

### *Team-Pair-Solo*

This approach is similar to but opposite of Think-Pair-Share. During this approach, students first complete a problem as a "team". Next, they complete a similar problem as a "pair". Finally, students complete problems "solo". This approach is designed to help students engage and succeed with problems which can initially be beyond the ability but can be solved within the context of a group: this is based on the concept of mediated learning. By allowing students to work on problems they could not do alone first as a team and then with a partner, they move to a position that they can do alone what at first they could not complete or could only do with help. As the students are looking up the pros and cons of using a straw, this approach will be a helpful way to differentiate and assist students who may feel overwhelmed with the task individually. Only the students who need support will take part in this approach. As a small group, students will access designated websites and look up the pros and cons of using straws.

### *Three Minute Review*

In this approach, the teacher stops at any time during instruction or discussion, a timer or other signal may be used to begin, and gives students three minutes to review what has been said or ask or answer questions about the lecture. This activity will be useful when new vocabulary is being introduced. Students can then discuss, act out, illustrate, or choose a way that will help them to remember the new words they are learning. Since this activity is timed, the focus is not on the product, but on the varied way students choose to represent the vocabulary. After introducing and explaining recycling, we will stop, drop our voices, and draw, sing, or perform like a product being recycled.

### *Partners*

The class gets divided into teams of four. The group then divides into two partner teams, team A and Team B. Team A partners meets in one location and Team B partners meet in another. Now half of each original team is given an assignment to master to be able to teach to the other half. Four stations will be set up around the room with each pair only visiting two stations. Partners work to learn the material, they may consult with other partner groups working on the same material. The original foursome come back together with each set of partners teaching the other set the information they learned at their

stations. Partners can quiz and tutor teammates and finally create a product to highlight all of the integrated learning. An example would be, Team A learns about the pros and cons of using plastic bags while Team B learns about pros and cons of using paper bags. They will then return to the foursome and teach the other members of the group the information they have learned. The group will then make a choice about which bag they would prefer to use, justify their choice, and present their decision to the class.

## **Classroom Activities**

### Activity One

Mentor Text: *The Three R's: Reuse, Reduce, Recycle* Written by Nuria Roca<sup>16</sup>

Procedure: This activity will take place at the beginning of the unit and will be an introduction to our topic. I will provide an initial explanation of the terms refuse, reduce, reuse, and recycle. There will be multiple pictures of everyday items hung around the room. Students will be in teams of 3 or 4 and will be handed some Post-It® notes. They will travel from each poster following a Gallery Walk procedure. Students will look at these pictures of items from their everyday life and will decide if it would be best to refuse that item, reduce usage of that item, reuse the item, or recycle the item. They will write their choice on their Post-It® note and attach it to the poster. When this gallery walk is completed, students will discuss and try to justify their choice. This will then lead into the students formulating definitions of the terms in their own words. A graphic organizer will be created for the students. The graphic organizer will have four boxes with the terms refuse, reduce, reuse, and recycle in each one of the boxes. Students will use their own words to record a definition of these terms and will search on-line for items they may use and that they could sort into each category. They will develop an explanation of why they have chosen to place this item into a specific category. It will be acceptable to have the same picture in more than one category, but the student will need to justify their decisions.

Time frame: two 30 minute class periods

Materials needed: *The Three R's: Reuse, Reduce, Recycle*, Pictures of everyday items that can be classified into categories for refuse, reduce, reuse, and recycle; Post-It® notes, markers, graphic organizer- presented on-line so students can copy and paste images into the document.

### Activity Two

Mentor Text: *One Plastic Bag: Isatou Ceesay and the Recycling Women of The Gambia*<sup>17</sup>  
Written by: Miranda Paul

Procedure: This activity will begin with me presenting the book, *One Plastic Bag: Isatou Ceesay and the Recycling Women of The Gambia*, to my students. We will do a quick picture walk through the book and look up The Gambia on our wall map. Then the students will write five questions they have about the book. Before reading the book, we will complete a lesson on changing thin questions into thick questions. A question like; “Where is The Gambia?” could be changed into, “How is The Gambia similar to and different from Wilmington?” Once students have five good, thick questions I will read the book to the students. After reading the book, students will work with a partner to answer each other’s thick questions about the book. Next, students will complete a graphic organizer sequencing the story. At the end of the book there is a glossary and pronunciation guide. I will create flashcards to review with the students and then post in the classroom. As a class, we will take a walk through the neighborhood. We will look to see if there is any garbage on the streets or in the bushes. Students will attempt to identify what the garbage type is and we will place the information into a data table. When we return to the classroom we will analyze the data collected about the garbage in the neighborhood around our school. Students will then brainstorm ideas of what we could do to clean up our neighborhood. Students will write an essay detailing how they could help to clean up our neighborhood. Additionally, I would like to try to find someone who knows how to crochet and attempt to crochet some plastic bags into purses or something else like the women from The Gambia.

Time frame: five 45 minute class periods (more class period may be needed if we do crocheting)

Materials needed: *One Plastic Bag: Isatou Ceesay and the Recycling Women of The Gambia*, journals, world wall map, sequencing graphic organizer, blank data table for neighborhood garbage data collection. If possible crochet hooks and cleaned plastic bags.

### Activity Three

Mentor Text: *Human Footprint; Everything You Will Eat, Use, Wear, Buy, and Throw Out In Your Lifetime*<sup>18</sup>

Procedure: I will read the book aloud to students in a whole group setting. Students will participate in a class discussion about the book. We will highlight in our discussion things that amazed them and things that confused them. After the class discussion, students will work with partners. Each partner pair will have a copy of the book. The partners will decide which item they would like to further discuss. The book states that the facts are based on a lifespan of 77.75 years.<sup>19</sup> Student will attempt to calculate how much of the item they have already used in their life span. For the purpose of making calculations simpler for my third graders, we will round the lifespan to 78 years and we will calculate their age as a whole number, not including how many additional months they are. Then, we will look at the back of the book where there are 7 tips on how to

shrink your human footprint. Students will select at least one of the tips that they feel they could do and explain how they will use this tip to reduce their human footprint. Students will present their information to the class.

Time frame: two 30 minute class periods

Materials needed: *Human Footprint; Everything You Will Eat, Use, Wear, Buy, and Throw Out In Your Lifetime*, journals.

## **Appendix A**

We will be primarily highlighting the Third Grade Writing standards through this unit; CCSSELA W3.1: Students will write an opinion piece on a topic supporting a point of view with reasons. The base of their writing will be focused around a short research project; CCSSELA W3.7: Students will conduct a short research project that will build knowledge about a topic. Using technology will enhance their projects and learning; CCSSELA W3.6: Students will with guidance and support from adults, use technology to produce and publish writing as well as to interact and collaborate with others. CCSSELA W3.8: Students will recall information from experiences or gather information from print and digital sources: take brief notes on sources and sort evidence into categories. Students will create a PSA for their topic; CCSSELA SL3.6: Students will create engaging audio recordings or stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details. There will be Next Generation Science Standards introduced. We will look at cross grade work in Earth and Human Activity; K-ESS3-3: Students will communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. 4-ESS3-1: Students will obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. 5-ESS3-1: Students will obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

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## Notes

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