

5-2023

Increasing Awareness of Ocean and Beach Pollution for Elementary School Students

Hana Terfai

Follow this and additional works at: https://digitalcommons.csumb.edu/caps_thes_all

This Capstone Project (Open Access) is brought to you for free and open access by Digital Commons @ CSUMB. It has been accepted for inclusion in Capstone Projects and Master's Theses by an authorized administrator of Digital Commons @ CSUMB. For more information, please contact digitalcommons@csumb.edu.

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

Increasing Awareness of Ocean and Beach Pollution for Elementary School Students

Hana Terfai

A Capstone project for the Bachelor of Science in Human Development and Family Science

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

Increasing Awareness of Ocean and Beach Pollution for Elementary School Students

Introduction

Applied science education is often missing in elementary school curriculum. When children get exposed to applied science early on then they would get more access to education about how to care for and conserve ocean and environmental life. The consequences if the problem is not resolved is that the group of children at Frank Ledesma would not be aware or educated on this important issue that exists right now. Therefore, I created a two-day lesson for the elementary school students in grade 4 at Frank Ledesma Elementary School in Soledad, California.

Needs Statement

The problem that I will be focusing on is the problem that the environment faces regarding plastic pollution and the threat that it creates to ocean life. The benefits if the problem is resolved is that children would get more access to education about how to care for and conserve ocean and environmental life. The consequences if the problem is not resolved is that future generations of children in public elementary schools would not be aware or educated on this important issue that exists right now. Therefore, I created a two-day lesson (or workshop) for the elementary school students at Soledad, California. There is not enough awareness on this issue especially in schools with students from minority communities. This is a very important topic to be exposed to at an early age so that more students know about it from early on. Such a key topic such as this one must be focused on in elementary school age because this gives us the tools we need to be able to actually go out into the world and find programs and non-profit organizations that focus on ocean conservation and saving helpless animals in the ocean. The

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

more aware that we are, the more progress can be made as a community. If a certain place in the world is truly affected by trash, toxic waste, and plastic, then the actual ecosystem changes all together which can be extremely harmful for the environment, a large amount of toxic waste will eventually alter the planet and so the animals may not be able to survive. There is megaplastic, macroplastic, mesoplastic, and microplastic all together. (Thushari, Senevirathna). All of these plastics all together add up to a big mass and it is actually the microplastic that is a huge threat to the ocean and to sea animals because these are fragments of plastic that are so small to the eye that it is really hard to notice the difference between plastic and potential food. All of the animals that are exposed to these plastics, can be harmed and it is up to us to help and do all that we can to save ocean life as much as we can. Most of this plastic comes from land and from humans that do not pick up after themselves, only 20% of plastic in the ocean comes from marine items such as fish nets. (Ritchie, Roser).

Bringing up policies to legislation and trying to make it more expensive to use plastic bags would be such a pivotal way to combat this issue. The more people are told that plastic use is dangerous for the planet, the more they will see and understand that we must act now to change the way this is going. Having elected officials who will actually educate the public on the reasons why we must reduce waste is something that could completely change and alter the fate that we have and this is really key to let as many people as possible know. (Thushari, Senevirathna). It was barely more than a few decades ago that global officials in politics worldwide actually acknowledged the crisis that we are currently facing and so not enough has been done to combat this issue even until today. Plastics such as the ones for our everyday use are a big part of the problem.

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

This awareness on such a crucial issue needs to be discussed in the classroom (citation needed).

The more education there is in schools about the subject of plastic pollution, the more willing the students will be to learn new ways to figure out a solution to help this problem, education opens doors for a new perspective toward a challenge. (Chow, So, et al.,2017). Therefore, my 2-day curriculum enhances awareness on the critical problem of ocean and plastic pollution on beaches and the ocean.

Theory

Elementary students are what is known as the “Elementary Mental Functions” and it is our social and cultural environment that allows us to use these elementary skills. The Sociocultural Theory from Vygotsky really touches on the fact that we learn as children from social and cultural interaction. We as humans, absorb more information and we learn from a social background such as in elementary schools and with school teachers everyday. Vygotsky believed that this is how we all developed as humans. We learn from our social interactions with others and through our everyday culture that we live through. The theory from Vygotsky that human development comes from social and historical interactions very much ties in with my own project because I will approach the idea of ocean conservation and wildlife in the oceans from social perspectives. Touching on this idea is also tied in with our cultural perspectives and social perspectives because the idea of saving the oceans and the wildlife in it is very much a social and cultural issue. Learning about this topic is very vital and we learn most of our virtues and information from our schools in social topics. Learning about how important our oceans are and the animals that are in it is something that is very important and vital to learn as a young student. The next theory is that human development also comes from our own cultural experiences and perspectives. Vygotsky said that people are always in culture, which then is what shapes their thoughts, language, and development. The Zone of Proximal Development and scaffolding in relationship, to this theory is important because it explains that as people, we are not able to learn or do certain things in our lives on our own or not on our own. The

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

zone of proximal development is when one learns through scaffolding and with assistance. In this case, with my own capstone, this relates because the topic of ocean and environmental pollution is something that would not be able to be reached if one was not being taught it at such a young age in fifth grade.

Consideration of Diversity

My project will be conducted at Frank Ledesma Elementary School in Soledad, California in a fourth grade class. According to the School Accountability Report Card (SARC; 2021-22), Frank Ledesma Elementary School is 1.0% Asian, 0.6% African American, 2.0% Filipino, 93.2% Hispanic or Latino, 0.0% Native Hawaiian or Pacific Islander, 0.4% Two or More Races, and 2.7% White. To add, 41.6 % are English Language Learners, 0.2% are Foster Youth, 3.3% are Homeless, 2.3% are Migrant, 91.2% are Socioeconomically Disadvantaged and then 11.1% are Students with Disabilities. I expect my participants to reflect the demographics of the school. Aspects of diversity that could affect my project are that, due to the location of the elementary school and the socioeconomic status, going to the aquarium regularly or having trips to the beach regularly may not be a reality for some students, so I have to make sure that I am really trying to “bring” the concepts about ocean to them as much as possible while also considering the diversity of the students.

Learning Outcomes

Upon completion of the project students will be able to,

1. Identify two ways to reuse plastic
2. Identify two ways to use fewer unnatural products
3. Identify two reasons why using plastic is detrimental to our oceans and environment

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

Method

I created a two-day lesson plan on ocean and beach and environmental pollution for fourth graders at Frank Ledesma Elementary School in Soledad, California.

Day 1: On the first day, I began with a short, five-minute video

((<https://www.youtube.com/watch?v=MEb7nnMLcaA>) to show the class what topic I will focus on for that day. It illustrates many ways that oceans are polluted and how toxic chemicals such as oil spills can really harm the ocean and wildlife that live in it. After, I will go over the content of the video to make sure all subjects are clear and everyone understands. After that I will present my powerpoint on oil and toxic waste in our oceans. This will be able to explain in extreme detail the harmful effects of toxic pollution in our oceans. I made the powerpoint presentation to better illustrate the problem and to also give a visual aid that can further explain the problem I am focusing on; this took about 25 minutes. See Appendix A for the powerpoint presentation. Then, I will bring in the water “tank” that I will fill with water in order to symbolize oceans. I plan to first bring in the water tank with clean water, and I will also include fake sea animals such as whales, sharks, sea turtles, sharks and sea otters. I will have all of the sea animals in the water tank and then once the class sees all of the animals in the water (the pretend ocean). Before starting, I will solicit ideas from them on what kinds of toxic chemicals and plastic/trash ends up in the ocean. I will then begin to pour in oil (soy sauce) to show how an oil spill can easily ruin and devastate large portions of oceans. I will also add Kool Aid to use as “car soap” which is another toxic chemical that flows into oceans. I will also add in plastic pollution as well as colored sprinkles to symbolize the dog poop that is left behind by owners who do not pick up after their pets and therefore, the toxic poop to the sea animals ends up in the ocean. To

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

symbolize any other toxic waste, I will also add coffee into the water tank to make it very clear how much the water in oceans can change. After, I add in all of the toxic chemicals and waste, I will then ask the children what they think about the problem and what options the animals have when this occurs in their homes and in their parts of the oceans which I will write down and document. I will write down all of their ideas down. I will explain how all of these toxic chemicals end up in the ocean and on the beach. I will then explain ways to help preserve and protect oceans and the animals in them such as stop using toxic chemicals and saving our water use and limiting it as much as possible.

Day 2: For the second day, I began by showing a short Youtube video titled, “What is Plastic Pollution?” from Peekaboo Kidz (https://www.youtube.com/watch?v=ODni_Bey154) which is about 7-8 minutes long. What this video touches on is the way that plastic ends up in the ocean and what harm it can do once it’s there. It goes into detail just enough for fourth grade students to be able to fully understand and comprehend. Once the video ends, I will present the powerpoint that I made to better illustrate the effects of plastic pollution in our oceans and on our beaches. This powerpoint presentation was extremely detailed and got into every point of why and how plastic pollution ends up in our oceans and affects the wildlife and water. I will bring in a kiddie pool full of sand and nothing but plastic trash and waste in it, which will symbolize the beaches and the sand, and it will be covered with plastic so that the class can see how damaging plastic waste can be. This will symbolize the way the beach will become when we don’t do our part to clean it. It will be Starbucks plastic cups, plastic water bottles, plastic lids, and plastic straws. I will then present a short slide presentation on the harmful effects of plastic pollution in oceans and on beaches, which will take about 30 minutes. See Appendix B for the powerpoint

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

presentation. This content will touch on important factors as well as why they should care about oceans and the animals that live in it as well as our environment. After, I asked the class in groups of six what ideas they have to help fix this crucial problem, and I documented them down on the poster board. I asked them the three learning outcome questions and I had them discuss them in a group for about two minutes. After this, I went to each table group and asked them “What are two ways to reuse plastic? What are two ways to use fewer unnatural products? And What are two reasons why using plastic is detrimental to our oceans and environment? These were all discussed together as a class as I wrote each table groups’ answer down. By the end of day 2, I will regroup and go over everything they have discussed in the past two days and hear their ideas once more. I will also pass out stickers as a small thank you for their participation, time, and promising ideas on this topic.

Appendix A:

This is my powerpoint on ocean pollution that I presented to the class

<https://docs.google.com/presentation/d/1Wvok-WcpoDh0DY3gX9NzMr-ODcWoeO7wK2IdQmCS3R8/edit?usp=sharing>

Appendix B:

This is my powerpoint on plastic pollution that I presented to the class

<https://docs.google.com/presentation/d/1ZKyFKu9NJ9HfccGEUQkQ17mbVA9LX3kFTduD7TwXAuo/edit?usp=sharing>

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

Appendix C:

This is my presentation from the Capstone Festival

<https://docs.google.com/presentation/d/1Xxbsj5S6fVmzyHXlRbI3-AqbO5MZFmYnKZnQcWyuKcw/edit?usp=sharing>

Results

The first learning outcome was that the participants were to indicate two ways to reuse plastic. I asked the children in groups of the tables that they were sitting in asking each table what were two ways to reuse plastic. I have the collective results from each table in the classroom. I gave each table a chance to answer and to gather their ideas as a group so that they could all brainstorm together and work together. See Table 1 for details.

Table 1: What are two ways to reuse plastic?

1. Reusing bags for grocery shopping and Water Bottles	2. Reusable Water Bottles	3. Reusable Shopping Bags
4. Reuse one-time use plastic	5. Reuse plastic so that the animals cannot get hurt or get cut	6. Use reusable straws so that they don't hurt the sea animals

Table 1: First group of students in Table 1: “Reusing bags for grocery shopping and Water Bottles” Table 2: “Reusable Water Bottles” Table 3: “Reusable shopping bags” Table 4: “Reuse one-time use plastic” Table 5: “Reuse plastic so that the animals cannot get hurt or get cut” Table 6: “Use reusable straws so that they don't hurt the sea animals”

Each table group had their own ideas and really demonstrated an understanding for what I had discussed and talked about regarding this learning outcome. They successfully came up with

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

ideas for the learning outcome and they all brought up great points. Therefore, I believe that this learning outcome was met.

The second learning outcome was for participants to indicate two ways to use fewer unnatural and harmful products and materials. The children seemed to really grasp this concept as well and they came up with so many great ideas to talk about. Each one had their own great perspectives and they really brought it all together as a table group. See Table 2 for details. They successfully came up with really exceptional examples and ideas. Therefore, I believe that this learning outcome was met.

Table 2:

What are two ways to use fewer unnatural products?

1. Thrift shopping and Reuse	2. Use natural cleaning products	3. Do not use raid to kill animals
4. Do not use clorox	5. Do not use bleach it has harmful chemicals	6. Try to use soap that is natural but still cleans

Table Group 1: “Thrift Shopping and Reuse” Table Group 2: “Use natural cleaning products”

Table Group 3: “Do not use raid to kill animals” Table Group 4: “Do not use clorox” Table

Group 5: “Do not use bleach it has harmful chemicals” Table Group 6: “Try to use a soap that is

natural but still cleans”. Each table group here is successfully able to explain different ideas of

how to use less unnatural products that could potentially harm our oceans, beaches and

environment. Therefore, I believe that this learning outcome was met.

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

Learning Outcome #3:

The third learning outcome for my topic is, what are two reasons why using plastic is detrimental to our environment, oceans and sea life? This was another learning outcome that seemed to really get the class excited. They really enjoyed talking about it and discussing it. They each had really great ideas, see Table 3 for details. We discussed as a group and then we went over each table's ideas all together.

Table 3:

Identify/What are two reasons why using plastic is detrimental to our oceans and environment?

1. Plastic straws can get stuck in the nostrils of sea turtles	2. Sea turtles can eat plastic bags	3. We need to stop plastic from going to the ocean so we make sure the trash goes inside the trash/recycling can
4. If sea animals swallow it, they can get really sick or cut themselves	5. Plastic looks like food for some sea animals so they might eat it	6. The plastic can get stuck in their throats and cause them to stop eating and the plastic can fall all the way to the ocean floor

Table Group #1: "Plastic straws can get stuck in the nostrils of sea turtles" Table Group #2: "Sea turtles can eat plastic bags" Table Group #3: "We need to stop plastic from going to the ocean so we make sure the trash goes inside the trash/recycling can" Table Group #4: "If sea animals swallow it, they can get really sick or cut themselves" Table Group #5: "Plastic looks like food for some sea animals so they might eat it" Table Group #6: "The plastic can get stuck in their throats and cause them to stop eating and the plastic can fall all the way to the ocean floor".

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

All of the table groups were able to come together and form different ideas as a solid group to come up with ideas of why this can cause so much harm. They each connected back to their own individual lives and scenarios. They were able to successfully speak on subjects that we had previously discussed and talked about. I was very impressed with their ideas and the ways that they were able to work together and collaborate to come up with different solutions. Therefore, I believe that this learning outcome was met.

Discussion

This project was successfully completed, the outcomes were met, and the children really were able to understand the topic in its entirety. I do think that based on my opinion, it did really work well. The participants responded so incredibly well to the activities, and they all had their own stories, perspectives, and ideas to share. It was not long at all until they wanted their own voices to be heard, and they were all eager to share their similarities and differences when it came to ocean pollution, cleaning up beaches, and their experiences with ocean animals and ocean life. Also connecting to Vygotsky's sociocultural theory, we learn ways to be cleaner and more efficient through our social backgrounds such as school, family and so on so that also comes into a bigger picture all together. Vygotsky says that a child's learning ability and cognitive development is guided by their social interactions. Therefore, because of this, my project connects to Vygotsky's theory because we are taught to care for the ocean and the environment around us through social interactions. At a young age, in elementary school, we are taught about the environment and the ocean and what we can do to help keep it as clean as possible and so this connects to what we are taught through social interactions. If we are taught from an early age about the dangers and the problems of pollution early on, then it will make us

OCEAN/BEACH POLLUTION AWARENESS FOR ELEMENTARY STUDENTS

much more aware later on down the line when we are older and able to help make a difference. I was fortunate enough to have done my curriculum project in a predominantly Hispanic community so it was important to connect with a community that is a minority that may not get the opportunities as more privileged students who have much more opportunities for information about how to take care of the ocean. To hear their ideas for ways that they can save our ocean animals and our oceans and beaches was really interesting to be a part of. What could be done to include more diversity in participants could be to possibly do part of the curriculum only in Spanish and discuss words in Spanish such as “ocean”, “beach” or animals such as “whales.” That could bring more diversity and inclusion by bringing in another element of languages into the picture. What I would do differently if I had to do this again would be to actually be able to have a field trip to the beach where the children could be in the actual environment, and we could discuss ocean life and the animals that live there while also discussing the trash that we see all around us. In the future, I hope that the participants will look at ocean pollution a bit differently and think twice before they use one-time-use plastics and think back to the time that we discussed how to save our oceans.

Work Cited

Chow, C.-F., So, W.-M. W., Cheung, T.-Y., & Yeung, S.-K. D. (2017). Plastic waste problem and education for Plastic Waste Management. *Emerging Practices in Scholarship of Learning and Teaching in a Digital Era*, https://doi.org/10.1007/978-981-10-3344-5_8

Hannah Ritchie and Max Roser (2018) - "Plastic Pollution". Published online at OurWorldInData.org. Retrieved from: <https://ourworldindata.org/plastic-pollution> [Online Resource]

Kulkarni, G. (2010). Environmental concerns and climate change: Need for proactive participation. *Indian Journal of Occupational and Environmental Medicine*, 14(1), 1–2. <https://doi.org/10.4103/0019-5278.64606>

Sheavly, S. B., & Register, K. M. (2007). Marine Debris & Plastics: Environmental concerns, sources, impacts and solutions. *Journal of Polymers and the Environment*, 15(4). <https://doi.org/10.1007/s10924-007-0074-3>

Thushari, G. G. N., & Senevirathna, J. D. M. (2020). Plastic pollution in the marine environment. *Heliyon*, 6(8). <https://doi.org/10.1016/j.heliyon.2020.e04709>