

Transforming Students into Researchers Using Photography and Citizen Science Applications

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Introduction/Rationale

This unit, “Transforming Students into Researchers Using Photography and Citizen Science Applications” is directed for Kindergarten teachers. It is for teachers who are seeking innovative ways to integrate the common core Social Studies standards for “Long Ago and Today” with Next Generation Science standards and Kindergarten informative writing standards. The unit is for Kindergarten teachers who also seek an “outdoor” setting which will provide an opportunity to increase student engagement by having a fifth-grade research buddy to aid in citizen science photography skills, research skills, and writing skills. The unit focuses on exploring the Lenape Indigenous culture to help students develop an understanding of the similarities between families now and in the past. Students will develop an awareness of the Lenape Indian Tribe of Delaware that existed in Delaware long ago and in the present-day society. The unit will teach students how to identify native trees, plants used by the Lenape and how flora and fauna are beneficial to the culture. The students will learn how to use technology to take photographs, identify the photo using a citizen science application, and then draw and write informatively about their findings. The unit will also feature student presentations about the Lenape culture long ago and today upon conclusion of the instruction.

This school year will mark the eleventh year I have taught Kindergarten at Thurgood Marshall Elementary School. For all ten prior years I have taught a unit called “Long ago and today” for Social Studies and it has been tedious! (Both for me and my students.)

Thurgood Marshall Elementary School is the largest elementary school in the Christina School District. It is located about twelve miles from Newark and the University of Delaware. As of September 30, 2019, the enrollment for the school year was 787, however that number has climbed to reflect that there are currently 800 students enrolled in grades K-5.

According to the Delaware Department of Education and Christina School District, the student population is 31.39% Asian American students, 31.26% Black or African American students, 8.775% Hispanic or Latino students, 4.45% of Pacific Islander students, and 24.02% Caucasian students. Our English Language Learner population comprises 13.4% of our base, and 14.8% of our students are considered low income. This school offers impressive cultural diversity for learning opportunities about family traditions. Our English Language Learner population hail from nineteen different countries! Each year Marshall holds an annual “Multicultural Family Night” to honor and highlight the numerous countries and languages represented by our student population. It is always a success and there is barely enough room to see all the exhibits because attendance is overflowing! But sadly, I noticed this past year that we did not have any exhibits featuring the Lenape Indian Tribe of Delaware. Nor has the Kindergarten team at Marshall ever invited a speaker from the Lenape Indian Tribe of Delaware. I will include the Lenape culture in the unit and invite a speaker to participate at our Multicultural night next spring 2021. If a volunteer is unable to join us, then our student displays

will certainly feature photos and written information regarding what they learned about the Lenape Indian Tribe during that event.

In February 2020, I attended the Delaware Teacher Institute tenth annual curriculum showcase at the University of Delaware. Upon listening to Professor Jon Cox speak about his seminar topic, “Connecting with Indigenous Wisdom through Photographic Participatory Science”, I was immediately inspired to try to create a new unit. This unit would allow me to hone my pedagogy as well as share my personal passion for taking photos of nature. The lectures I attended this past spring with Professor Cox and colleagues in this seminar have enabled me to share three points for how the knowledge gained in the sessions will enhance my curriculum in the social studies unit. Here are those three points.

First, as I mentioned, our Social Studies unit on Long Ago and Today is boring and always taught inside the room at the end of the day when my five- and six-year-old students are only thinking about dismissal. To make my Social Studies unit more exciting, I plan on incorporating photography-based lessons and inviting guest speakers to engage my students. I will also use videos from the litde.net site. I can also integrate this lesson with science and writing in the spring of 2021.

Second, in the past, I rarely had any behavioral challenges with children and tree branches before. This year I noticed that there were numerous students who were damaging our playground trees! When I delved deeper and asked my students about how much they play outside, the overwhelming response was that they prefer to stay inside and play video games instead. This led me to start wondering how I could influence their connection with nature and learn to appreciate our trees and plants in a more loving and positive way. This seminar and reading the book *Braiding Sweetgrass* has inspired me to connect more closely to nature on a personal level. As a result of this connection, I have been reflecting on ways that I may be able to inspire my students to connect to nature. After all, that is what Robin Wall Kimmerer teaches in her book!

Third, if my students received a classroom reward, they always chose the option to “bring electronics” to school. Almost all my students have their own iPads or smartphones that they could bring from home whenever they voted to celebrate; they never voted for extra time outside. So, it is time to get them outside for academics and teach them how to create a positive relationship with their environment while teaching Social Studies, Science, and Writing! Five- and six-year-old students are naturally curious about everything! Why not bring the electronics outside and instead of playing video games: teach them how to be researchers? That is what I am learning to do in this seminar. Furthermore, I envision them absolutely loving learning how to take photographs with a 5th grade “Research Buddy” and learn how to write about their photographs and treat nature with respect based on hearing tales from Lenape docents who can come visit our school. The citizen science applications that I have learned to use in this seminar (i-naturalist, leaf snap, i-naturalist seek) have been very engaging! I would like to teach my students and their families about these applications.

The unit I will introduce will teach Kindergarten students about the Lenape Indian Tribe of Delaware who lived in our state years ago in the past and still live in Delaware now. This unit will be introduced during the Social Studies unit: Long Ago and Today. My lesson will also integrate the Social Studies curriculum with our Next Generation Science Standards when we study trees and plants that are native to our present-day existence as well as how those plants and

trees were utilized by the Lenape Tribe long ago and today. The lesson will “transform my students into researchers” by introducing them to photography and citizen science applications we can use to learn about the native plants and trees. This lesson will also teach them why we must respect our earth. It will also incorporate using their research to present at our annual Multicultural Night. It is my ultimate hope that the lesson will teach them why they must respect our trees and their environment while learning about past cultures. I would also encourage my students to “teach” their parents how to use the applications and begin their own “nature journeys” when they are home.

Content

Understanding the objectives is critical in understanding the content. Before the unit is introduced, each Kindergartener will be assessed using a half page survey to determine prior knowledge. They will be asked questions like: have you taken photos with an iPad, Chromebook or cell phone? Have you ever studied outside? Do you like playing outside or would you rather stay inside to play? Have you heard of the Lenape Indian Tribe of Delaware? Have you ever planted a tree or shrub at home? Do you know what “research” means? This formal assessment will help me understand the experiences that my students will have had prior to teaching the unit. A parent letter explaining the course work and expectations will also be sent home so that families will understand our curriculum content.

Another objective will be to influence my students to appreciate nature in a loving and positive way using Lenape traditional customs from their culture. As I mentioned, last year I saw numerous children breaking tree branches, pulling on the tree leaves and choosing to use the branches they broke to make swords, despite numerous lectures and teacher modeling to stop those actions. By teaching the students about Lenape native plants and trees and sharing how those trees were used in the past and how they still use them now, it is my intent to introduce nature as something to respect-including those precious tree branches!

It is also my endeavor to teach students how to use citizen science applications to walk around our school grounds and locate actual trees and plants that are growing on the Marshall school property. We will use smart phones and iPads to take photos of these trees and leaves and then identify them as native. I feel the more we take photos and learn about how these native plants and trees were utilized, the more “respected” they will be by the students.

Additional objectives for the unit include teaching students about the original people who lived in our state and in Kent county in the past and today. The unit objectives will satisfy Social studies standard K-3a, and K-3b as well as Next Generation Science Standard K-ESS-1 in which students will use a model to represent the relationship between the needs of different plants and humans and the places they live. Students will be referred to as “researchers” and paired with a fifth-grader. I have already confirmed this plan with a fifth-grade colleague. The pair will use either the fifth-grade classroom’s Chromebook, or iPad, or bring their own smartphone from home to take photographs of these trees and leaves. Both researchers, Kindergarteners and fifth-graders, will then research using a citizen science application to identify the tree leaf or plant. They will also use the internet to research the tree or plant identified. Student researchers will be taught the meaning of the word “research”. They will also be instructed on what citizen science is and what applications are available for free to use by students in a school setting.

Students will learn about the Lenape Indian Tribe of Delaware in terms of what they ate, what plants they used in their lives that may be located at our school or nearby. They will learn what roles each family member played in their culture and how those roles compare to the Kindergarten students today. They will learn what the timeline was for this Indigenous tribe and where they live now. They will learn what customs, games, traditions the Lenape experienced as well as what they still experience since LITD is still living in our region today.

Basic photographic skills will be taught using either Chromebook, iPads or smartphones as students will walk outside to use this equipment to take photos. These skills will be modeled by the teacher as well as their fifth-grade research buddy.

The writing objective for students will be to satisfy the CCSS.ELA-Literacy W.K.2 standard in which students will use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information on that topic. Students will be expected to display their photos (if they were printed), writing and drawings at the multicultural night. If for any reason this event is cancelled, then they will be expected to present at a separate classroom event held by the classroom teacher and students (along with the research buddies from fifth grade). After studying Lenape culture and studying the trees or plants, each student will write on this topic and a rubric will be shared ahead of time and sent home to parents as well. I also hope to collaborate with a fifth grade colleague to see if her fifth-graders can create a Diptych approach to display images of the native plants and trees discovered and create slides that show the photos side by side. Another ambitious project we could collaborate on would include asking fifth-grade students to catalog the plants and trees using the citizen science application i-naturalist. This way the flora and fauna could be tracked each year.

The final objective will be to grow an appreciation for teaching and learning outdoors, rather than inside. Students will be taught the value of being outside. The value of connecting to nature will be explored. I will offer lessons that engage the students with hands-on activities outdoors to help them reduce stress and restore depleted attention that may have occurred had they been “stuck inside” as in previous years during the social studies and science coursework. At this time of Covid-19, it would seem to me that being outside next spring will only continue to enhance positivity and joy that comes from being out in nature taking photos as opposed to working on tedious worksheets. The last objective will include a class planting of a “shadbush” tree on the grounds of the school. It will be dedicated to the Kindergarten class of 2021 and dedicated to our study of the Lenape Indian Tribe.

After understanding the objectives of the content, I have developed four key topics for the unit content: Legends, games, and music within Lenni-Lenape culture; native plants and trees; citizen science applications; and learning outdoors.

Understanding Lenni-Lenape Indian Tribe Culture in Delaware

As a Kindergarten teacher, I am charged with teaching a unit called “Long ago and Today” in which students explore traditions from the past and compare them to their own family traditions in the present day. For ten years I did not include any information on Indigenous people who were in our state long ago and still live here today. It really was not until I attended the Curriculum Showcase at the University of Delaware that I realized that this curriculum could be enhanced by including information about the Lenape Indian Tribe known as the Lenni-Lenape.

After hearing Seminar Leader Jon Cox explain the details of his seminar, I realized that including this information would be worthwhile and provide engagement for five- and six-year-olds who are naturally curious about the world around themselves, especially if that information would include “animal tales” and exploring outside!

To aide increasing student engagement, I will introduce a children’s book *When the Shadbush Blooms* by Carla Messinger. Ms. Messinger is a member of the Turtle Clan Lenape and is the director of the Native American Heritage Programs. In her storybook for children she writes that “Lenni-Lenape” means “original people” and that these original people lived in a vast forest area that covered parts of Delaware, Pennsylvania, New York, New Jersey, Maryland, and Connecticut.¹ Using brilliant illustrations, this story depicts how life looked back in the early days during the mid-1600s as well as shows illustrations of how ancestors of Lenape live today in the 21st century. It is a detailed resource to support the Social Studies standard K-3a. Prior to beginning the unit I will write a letter to Ms. Messinger and include my students in that activity to invite Ms. Messinger to either come to our school or arrange a Zoom meeting with her.

Further research reflects that in our state history timeline, Captain John Smith visited ten Lenape villages along the Nanticoke River in southern Delaware.²

In Jean Soderlund’s book *Lenape Country: Delaware Valley Society Before William Penn*, it is reported that a Quaker missionary discovered Lenape living in New Castle, along the Delaware River in 1672.³

I can imagine the looks on my students’ faces when I tell them we have a Native American Chief living in Delaware! I look forward to seeing the students’ faces when I show them videos and photos of Chief Quiet Thunder. Once I teach them that historians report that there were 20,000 Lenape community residents living in our state back then, and show students how they lived, and still live today, I feel they will be as “hooked” as one of the fish being caught by a Lenape bone fishing hook, especially if I am able to show a bone fishing hook or present one in real time! Researchers reveal that the Lenape farmed and used bow and arrow to hunt bear and deer. Women weaved baskets using wild grasses. Women also planted and tended vegetables like corn, beans, squash and they grew tobacco. Men used trees to carve out dug-out canoes for their transportation on the river.⁴

Legends, games, music

It is my experience that Kindergarteners love oral stories and tales involving animals! They also love playing games and hearing music. I will share three legends in this unit. The following is a cute one about how the raccoon gets his marks on his face.

According to a blog from the Lenape Delaware Tribe, there is a legend about how raccoons have markings on their faces. It is a legend told by Nora Thompson Dean:

This is about the little raccoons and what they said caused them to have little marks on their eyes. They said that the other creatures told him to go and borrow some firewood from the camps around. So, this coon then went to the camps to get some firewood sticks that were already aflame and blackened by the fire and burned on part of the stick. And they said his little coon fell with these in his hand and his face fell across these charred sticks. And that is why now he has little marks to show his

shame trying to steal something from the campers. That is the thing to tell the younger generation to not to steal anything because that mark will be upon you.⁵

Another Lenape animal belief relates to how the first tribesmen were born. According to Weslager, “the Lenape thought of the world as the back of a gigantic land turtle. There was nothing but water surrounding this land turtle. A huge turtle came up out of the sea and as the water fell back from his back, a tree took up its root in it. The tree sent up a sprout and the sprout appeared on the tree and that is how the woman was created.”⁶

And in her book *Braiding Sweetgrass*, author Robin Wall Kimmerer tells of a legend in which the vegetables planted by the Indigenous women were compared to real people: the three sisters method of gardening. According to Kimmerer, the Lenape believed that three vegetable plants (corn, beans, and squash) are the foundational vegetables needed to feed the earth and its people. These vegetables are referred to as “sisters” because each one relies on the strength and skills of the others.

Corn stalks start growing first. They provide the tall, sturdy spine. Beans are the middle sister. They sprout their seed and develop leaves and they grow up next to the corn, providing shade for the slower sister, the squash. Pumpkins, a type of squash, extend over the ground moving away from the corn and beans to produce wider leaves. These wider leaves will shelter the soil at the base of the corn and beans.⁷

According to Kimmerer’s legend,

There were three beautiful women who came on a snowy night. One was tall and dressed in yellow, with long flowing hair. The second wore green and the third was robed in orange. The three came inside to shelter by the fire. Food was scarce but the visiting strangers were fed generously. In gratitude for the generosity the three sisters revealed their true identities: corn, beans, and squash. And they gave the people abundance of seeds so that they would never go hungry again.⁸

According to the Oklahoma Lenape Tribe blog, we know that there were five main games:

Stomp dances were held throughout the year. Time was kept on a “water drum” and these dances provided a social time for all. There was also a game called “Pahsaheman” which is a Lenape football game. It is different than American football because it’s played with men competing against women! The men can only kick the ball from place to place but women can throw it or run with it! Also, the men are not supposed to tackle or grab the women. But the women can do whatever they want! They use goalposts at each end of the field.

There were other games too. One is called “Kokolesh” or Rabbit Tail. This game used a sharp stick with a string tied to the base and some cone shaped pieces on the string with a rabbit tail tied on the end of the string to keep the cones from coming off. The object is to catch the cones on the stick.

“Selahtikan” is a game using pieces of reeds which are decorated with various lines and dots (used for scoring). These were dropped onto a surface and then picked up one at a time without disturbing any other reeds. “Mamandin” is a dice game and

the dice were made of bone or deer antler. These dice were placed in a bowl made of wood. It was brought down on a folded hide or blanket to make the dice “jump” and then a score was kept.⁹

Sometimes “powwow” celebrations are held. Music is played on a large drum. A powwow is a celebration. A powwow is a dance in which traditional Indian clothing is worn. It will be fun to re-enact a “stomp dance” with our students. Perhaps this activity could be integrated with our Music and Physical Education teachers.

Native Plants and Trees

Lenape Indians were constantly grateful for nature.¹⁰ Author Robin Wall Kimmerer cites a similar belief: “Becoming Indigenous to a place means living as if your children’s future mattered; to take care of the land, both material and spiritual.”¹¹

In our seminar, we learn that there are many native plants and trees that were present back in the 1600s and that are still growing natively today in our area. To engage students and tie in the next generation science standards I will introduce students to explore the native plants and trees that are growing on our school grounds. There is a list of 35 of these plants from a list generated by Roger Mustalish. I would not expect to find all these species on the premises, but it will be fun to get outside and find them using our citizen science applications. I will teach the students how the Lenape used these native trees and plants in their daily lives, and we can take photographs of the ones we find and discuss each in more detail.

It is my hope that once we start learning more about how the Lenape respected nature, and students start photographing these native plants and trees, that they will slowly understand the importance of the plant or tree and start appreciating each (rather than pull or break branches as in the past). I plan to tie the book *When the Shadbush Blooms* to planting a class shadbush in the spring as part of this unit. I feel that when we plant a real shadbush, we will also feel a “bond” to it, and it will become part of our classroom “family.”

Citizen Science Applications: What is it and why use it?

Citizen science is a partnership between students and teachers and researchers. Using citizen science applications on a technological device such as a smartphone will provide more hands-on activity for my students. Studies have shown that “introducing interactive, research-based models of education can greatly improve classroom performance and retention.”¹² Perhaps the best place for this learning to happen is in nature.

During the seminar we learned how to access citizen science applications. The ones I used the most are the ones I will teach in class: i-naturalist, seek by i-naturalist, and leaf snap. These applications are easily downloadable, free and easy to use to identify the name of a plant and look at its photograph. The reason I want to use an application is because children love using technology and they love going on “scavenger hunts” to find things. I know that when I tried taking photos of unknown plants and trees in my neighborhood, it was so fun to find the name and photo immediately on the smart phone! I can envision watching my young “researchers” using technology and seeking plants and trees on our grounds! So not only will citizen science support our next generation science standards, it will connect the learners to nature, and increase student engagement.

Learning Outdoors: How does this link to Lenape? What are the benefits to students?

Lenape community members have valued nature. The Lenape people even followed the cycles of fishing, hunting, planting, tending gardens, and taking in the harvest and they named a moon for each cycle and each moon represents a significant aspect of nature.¹³ This is true in the past and in the present. I will make the connection between how the Lenape valued nature and why we should value nature at our school and in our homes. I will also contact the Lenape Indian Tribe located in Oklahoma to learn if they have any additional resources on this topic.

For the past ten years, Social Studies and Science have been scheduled to be taught at the very end of the day and inside the classroom. It has been challenging to keep my Kindergarten students awake and focused as most of them are thinking about heading to the bus and heading home. They are tired and hungry. If I am unable to alter the instructional schedule for this unit, taking them outside will be very beneficial.

According to an article from *Greater Good Magazine*, students who are learning outside tend to stay more focused on their inside learning tasks if they have been given outside time first.¹⁴ Additionally, these students have been found to be calmer. I have rarely taught a class outside unless it was studying clouds in our weather unit. But since the pandemic has created a germ filled inside world, I feel that being outside will only be better for my students' mental health as well as physical health. Being outside reduces stress, restores depleted attention, and improves immune function in children. Kids who are healthier, calmer, and less depleted may simply learn better.

Teaching Strategies

Fifth-grade research buddy: Kindergarten students enjoy working with fifth-graders. Each Kindergarten student will be paired with a student from Mrs. Watkins' classroom 23. They will be the research team that goes exploring outside to discover native trees or plants already on the Marshall campus. They will take photographs of these native plants and trees using the devices that 5th graders already use (iPads or Chromebooks).

Citizen Science Applications: While the fifth-grade researcher and Kindergarten researcher are working together, they will be taught how to use free citizen science apps such as leaf snap and i-naturalist. Once the students are taught how to use these two applications, then parents will be invited to the classroom to use their smartphones to discover plants and trees with their student.

Picture Sort: I will use picture sorts from the resources. I provide students with a range of pictures that match my lesson goal, then have them work together to sort the pictures into categories, for example: transportation, clothing, food, medicines, and spiritual aspects.

These categories will be labeled. Once the pictures are sorted, as a class we define our category labels based on what is common to all the pictures. By sorting into categories, students are highly engaged and more connected to the lesson's goals and objectives.

Exit Ticket: Exit tickets are a type of formative assessment. Basically, at the close of a lesson, students have to answer a question that demonstrates understanding of a concept taught that day. These assessments can be written, drawn, or verbal. One type of exit ticket I will use will be to ask each student to draw a type of transportation used by Lenape. (I will be looking for a response: dug out canoe.) Another example will be to circle one of the vegetables named the “three sisters” and they will be given three picture choices.

Kagan Structure: Hands Up, Stand Up, Pair Up: This is a strategy design to maximize student engagement. Each student is given a card with a word, picture, or question on it. They then stand up, spread out around the room and raise their hands. Each student high-fives a partner and then takes turns asking and sharing information about their card. After ideas are shared, the partners thank each other, raise their hands, and find a new partner to begin again.

Classroom Activities

“What’s in the bag? Talking Stick” activity: One of the essential questions I will introduce is: to ask the students, “What are some types of traditions, customs, foods, and transportation that the Lenape use now and long ago?” A fun way to “hook” my students will be to gather them around the carpet. The students will be sitting in a circle. I will be seated too. I will have a paper bag with the talking stick inside. I will ask them to guess what is in the bag. The student leader for that day will call on two or three students to guess. I will give them clues such as the object will help us learn how Native Americans gathered together to speak to one another respectfully. After some guesses I will pull out the talking stick and explain that this was given to me by a grandmother of one of my former students long ago and that it is a replica of a type of talking stick used long ago by Native Americans. I will explain that the person who holds the talking stick is the only person who may speak, and everyone else will show respect and listen. Afterward, I will show the children how to create a talking stick or enlist the support of our Art teacher to help.

K-W-L Chart activity: The next activity I will introduce is to use an anchor chart and write a K for “know already, W for “what do you want to know” and an L for “what did you learn” (after we are finished with our unit). I will ask the student leader of the day to hold the talking stick and give it to students who he/she calls on to answer these questions: What do you already know about Native Americans from long ago? What do you want to know or find out in our unit? I will record the student answers on the K-W-L chart and keep it for daily discussion.

Read Aloud: Another essential question I will ask the students is: “What similarities and differences do you see between the Lenape Indian Tribe of Delaware community members and yourselves?” I will read the story *When the Shadbush Blooms* by Carla Messinger. As I read and turn each page, I will refer to the illustrations and ask students to describe what is happening in them. What season do they see from long ago and what was taking place and then tell me what they see on the opposite page that represents what is happening in current times. We will complete the read aloud and compare and contrast the characters in the story to themselves. I will ask “What do you have in common with the characters from long ago in this story?” I will also ask my students “How are you and your families different from the Lenape children and their families based on the story?” I will use a Venn diagram to discuss these similarities and differences.

Picture Sort activity: This will be a fun way to engage the students and get them up and moving around. I will supply clip art photos of types of transportation, clothing, and food. Students will pair up with a partner and look for other people's pictures they think they belong with in a "blind sort." This sorting will depend on whether they show mode of transportation, clothing, or food. They will post their pictures up on the wall under the proper category and then the student leader of the day will call on partners to share what the pictures represent.

Research Buddies and Citizen Science activity outside: Another essential question I will ask in this unit is: "How will a Kindergarten student work together to research the flora and fauna on the Marshall campus?" This activity will feature the students in Kindergarten pairing up with pre-assigned fifth-graders from a fifth-grade classroom. I will train both the fifth-grade students and the Kindergarten students on how to download citizen science apps such as i-naturalist or leaf snap and download into technology devices. Then we will go outside and take photos of plants and trees that the students think may be native to Delaware and used long ago by the Lenape. If we are able to fund a photo printer then some of the photos will be printed (the native plants and trees). The goal for this activity is to encourage outside work and higher engagement as well as start to cultivate an appreciation for the importance of our plants and trees and how they are used by the Lenape, for daily life. There will be a home-school connection by assigning a homework project in which my Kindergarten students will show their parents how to use an application to search for native flora and fauna around their home and neighborhood and then participate in a "research show and tell" in our classroom.

Four-square Graphic Organizer writing activity: In Kindergarten when we write to inform, we use a four-square graphic organizer to draw pictures and sound out words to get our thoughts organized before we write our rough draft. This writing activity will be the beginning of a 3-part lesson culminating in a presentation conducted by fifth-grade research buddies and Kindergarten students. If we have our regular Spring Multi Cultural Event, then the students will display their informational writing on Lenape clothing, transportation, food, and games or ways of life and housing. If we do not offer the Multicultural Night, then the students will showcase their writing in our classroom and families will be invited.

Shadbush planting: If our funding is secured the students will plant a shadbush or serviceberry plant on the grounds of Marshall. This plant/shrub will serve as their "memory" of Kindergarten, and it will honor the Lenape culture. It is also my hope that planting their own shadbush will encourage a deeper connection to nature; they will all understand why it is not a healthy choice to pull branches or hurt our plants and trees.

Appendix

Common Core Standards:

Social Studies K-3a: Students will develop and understanding of the similarities between families now and in the past, including daily life today and other times, cultural origins of customs and beliefs around the world.

Social Studies Standard K-3b: Students will develop an awareness of major events and people in United States and Delaware history (demographics of who lived here and how they arrived, important people in our past, and different kinds of communities in Delaware and United States).

Next Generation Science Standard K-ESS-1: Students will use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.

CCSS.ELA-Literacy.W.K.2: Students will use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

CCSS.ELA-Literacy.SL.K.2 Students will confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.

Bibliography

“Frequently Asked Questions About the Lenape or Delaware Tribe.” Official Website of the Delaware Tribe of Indians. Accessed May 14, 2020.

<http://delawaretribe.org/blog/2013/06/26/faqs/#Games>.

This is a beneficial resource to learn more about the Lenape Indian Tribe of Delaware.

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<https://democracyeducationjournal.org/home/vol20/iss2/14>.

This resource helps explain how citizen science is a helpful tool in the classroom.

Kimmerer, Robin Wall. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*. Canada: Milkweed Editions, 2013.

Robin Wall Kimmerer sets the tone for understanding the importance of loving nature and treating nature with respect. This was the inspiration for the unit.

“Lenape Canoes.” Official Website of the Delaware Tribe of Indians. Accessed May 14, 2020.

<http://delawaretribe.org/blog/2013/06/27/lenape-canoes/#:~:text=Canoes%20were%20made%20from%20the,not%20suitable%20for%20canoe%20making>.

This resource informs teachers about the use of dugout canoes made long ago.

“Lenape Indian Fact Sheet: Native American Facts for Kids.” Native Languages of the Americas: Native American Cultures. Accessed May 14, 2020.

http://www.bigorrin.org/lenape_kids.htm.

This is an excellent resource to share with children as it is “kid friendly”.

“Lenape Life.” Official Website of the Delaware Tribe of Indians. Accessed May 14, 2020.

<http://delawaretribe.org/blog/2013/06/26/lenape-life/>.

This is another helpful resource with information about the Delaware Tribe of Indians.

“Lenape Stories.” Official Website of the Delaware Tribe of Indians. Accessed May 14, 2020. <http://delawaretribe.org/blog/2013/06/27/lenape-stories/>.

As the official website for the Lenape Indian Tribe of Delaware, it is chocked full of facts.

“Lenape Tribe: Facts, Clothes, Food and History.” Native Indian Tribes. Accessed May 14, 2020. <https://www.warpaths2peacepipes.com/indian-tribes/lenapi-tribe.htm>.

This resource offers interesting information about how the Lenape dressed, and what they ate.

“Lenape Women’s Clothing.” Official Website of the Delaware Tribe of Indians. Accessed May 14, 2020. <http://delawaretribe.org/blog/2013/06/27/lenape-womens-clothing/>.

If students wish to learn more about the types of clothing worn by Lenape Indians long ago, this site offers an abundance of information.

Messinger, Carla and Susan Katz. *When the Shadbush Blooms*. New York: Lee and Low Books, 2007.

This is a picture book that will serve as the main informational text for students to introduce “long and ago and today” in our Social Studies unit.

Newman, Joyce. “Native Plants 101: The Shadbush Story.” Last modified April 25, 2012. <https://www.nybg.org/blogs/plant-talk/2012//04/learning/native-plants-101-the-shadbush-story/#:~:text=One%20story%20is%20that%20the,known%20as%20the%20%27serviceberry%20tree.org>

Teachers will appreciate this resource to learn more about the shadbush if one is going to be planted.

Norwood, John R. *We Are Still Here! The Tribal Saga of New Jersey’s Nanticoke and Lenape Indians*. Moorestown: Native New Jersey Publications, 2007. https://nanticoke-lenape.info/images/We_Are_Still_Here_Nanticoke_and_Lenape_History_Booklet_pre-release_v2.pdf.

This resource offers more facts about the Lenape.

Quiet Thunder, Chief. “Lecture.” Online Portal for Delaware Teachers Institute Project. Video file. Accessed October, 2020. https://udel.instructure.com/courses/1506998/pages/chief-quiet-thunder-lecture?module_item_id=19086261.

This is a wonderful video that will engage the students as they “meet” Chief Quiet Thunder online!

Shah, Harsh R. and Luis R. Martinez. “Current Approaches in Implementing Citizen Science in the Classroom.” *Journal of Microbiology and Biology Education* 17, no. 1 (2016): 17-22. <https://doi.org/10.1128/jmbe.v17i1.1032>.

This article offers more insight on how to use citizen science and its benefits.

Soderlund, Jean. *Lenape Country: Delaware Valley Society Before William Penn*. Philadelphia: University of Pennsylvania Press, 2015.

This resource offers background history regarding the time long ago in our area.

“Standards-Based Field Trips Program Information.” Iron Hill Science Center. Accessed May 14, 2020. <http://ironhillsciencecenter.org/for-educators/field-trips/>.

This resource provides a handy location to visit in the spring that is near our school. Iron Hill Museum contains Lenape artifacts.

Suttie, Jill. “The Surprising Benefits of Teaching a Class Outside.” *Greater Good Magazine*. Last modified May 14, 2018.

https://greatergood.berkeley.edu/article/item/the_surprising_benefits_of_teaching_a_class_outside.

For years Social Studies has been taught inside and this article supports reasons why students will benefit from being outside “researchers”.

Weslager, C.A. *Delaware’s Forgotten Folk: The Story of the Moors and Nanticokes*. Philadelphia: University of Pennsylvania Press, 2006.

This resource offers factual details regarding the history and timeline of the people who lived “long ago and today” near our area.

Notes

¹ Carla Messinger and Susan Katz, *When the Shadbush Blooms* (New York: Lee and Low Books, 2007), 27.

² C.A. Weslager, *Delaware’s Forgotten Folk: The Story of the Moors and Nanticokes* (Philadelphia: University of Pennsylvania Press, 2006), 157.

³ Jean Soderlund, *Lenape Country: Delaware Valley Society Before William Penn* (Philadelphia: University of Pennsylvania Press, 2015), 1.

⁴ Weslager, *Delaware’s Forgotten Folk*, 48-49.

⁵ “Lenape Stories,” Official Website of the Delaware Tribe of Indians, accessed May 14, 2020, <http://delawaretribe.org/blog/2013/06/27/lenape-stories/>.

⁶ Weslager, *Delaware’s Forgotten Folk*, 161.

⁷ Robin Wall Kimmerer, *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants* (Canada: Milkweed Editions, 2013), 130-131.

⁸ Kimmerer, 131.

⁹ “Frequently Asked Questions About the Lenape or Delaware Tribe,” Official Website of the Delaware Tribe of Indians, accessed May 14, 2020, <http://delawaretribe.org/blog/2013/06/26/faqs/#Games>.

¹⁰ Weslager, *Delaware’s Forgotten Folk*, 163.

¹¹ Kimmerer, *Braiding Sweetgrass*, 9.

¹² Harsh R. Shah and Luis R. Martinez, “Current Approaches in Implementing Citizen Science in the Classroom,” *Journal of Microbiology and Biology Education* 17, no. 1 (2016): 17, accessed May 14, 2020, <https://doi.org/10.1128/jmbe.v17i1.1032>.

¹³ Messinger and Katz, *When the Shadbush Blooms*, 28.

¹⁴ Jill Suttie, “The Surprising Benefits of Teaching a Class Outside,” *Greater Good Magazine*, May 14, 2018, https://greatergood.berkeley.edu/article/item/the_surprising_benefits_of_teaching_a_class_outside.