

## **Growing Stewards with Ancient Wisdom and Modern Tech**

**Joseph Parrett**

### **Introduction**

I grew up in the forest, and the creek (not crick), and the marshes, and the fields. I marveled at the crayfish which I found under rocks in the stream, the salamanders that would scurry about the old abandoned spring house, the tadpoles that filled the marshy waters, and the lightning bugs (not fireflies) that would twinkle on and off before I was called in for the night. I grew up outdoors, surrounded by nature and all the other organisms that shared it with me. I appreciated the plants and animals that I grew up with, from the tiny British Soldier Lichen that my grandmother introduced to me, to the Black Walnut tree from which my tire swing hung. My students largely do not share this experience. Many do not have the exposure to the great outdoors that I received as a child. In turn, I fear that they may not develop my appreciation for the soil, the water, the sky, and other living things with which we share our neighborhoods and schoolyard. I propose to step outside our sanitized classroom, touch the morning dew, dirty our hands, and develop a relationship with nature.

We'll be dirtying our hands behind Kathleen Wilbur Elementary School in New Castle, Delaware. Wilbur is a large school of almost 1,200 students. Our 1,200 come from diverse backgrounds. They come from mansions, motels, and everywhere in between. I teach in one of the nine kindergarten classes found at the school. In each of these nine rooms you will find students of varying skill levels. Some will have grown as they attended years of preschool. Some will have learned much from Sesame Street, an older sibling, or an inspired parent. Other students may never have held a book before. In a typical year my class ranges between 20 and 22 students. As last year closed I had 22 students on my roll. I had an even split between male and female students (though this is actually atypical.) My class was predominantly (55%) of African-American descent. The rest (45%) of my class was pretty evenly split between Caucasian, Hispanic, and Asian backgrounds. Seven of my students were pulled out during the day to receive English Language support. Throughout the school year three of my students were regularly pulled from class to receive additional academic support. I also had one student who would go out weekly to receive behavioral intervention support, as well as a student who had an Individualized Education Plan put in place in his preschool setting. These numbers are pretty common among kindergarten classes at Wilbur and I anticipate a similar class makeup in future years.

## **Content Objectives**

### **Stewardship**

“Environmental Stewardship refers to the responsible use and protection of the natural environment, through conservation and sustainable practices.”<sup>1</sup> Stewards protect nature in differing ways. Some go out into the environment and take action to make a difference. Some stewards donate financial resources to causes that protect the natural world. Some stewards work tirelessly to steer groups towards making a difference. Stewardship, in all its forms, seems like an important thing to teach children. It is incredibly important that the next generation show a better appreciation of our home than my generation or the previous generation have shown. Earth is facing massive threats due to our modern-day lifestyles. Pollution is a serious problem. The Environmental Protection Agency (EPA) reported back in 2017 that on the average, every person in America produces 4.51 pounds of solid waste a day.<sup>2</sup> That equates to more than a quarter of a billion tons of trash production a year, just in America. America dumps more than half of that in landfills. Although politically contested, scientists agree that global warming is a result of our modern style of life. In fact, the Intergovernmental Panel on Climate Change states that “Scientific evidence for warming of the climate system is unequivocal”.<sup>3</sup> They also attribute this as a direct result of human activity. Another global concern is the rapidly approaching 6<sup>th</sup> mass extinction. Species of plants and animals are disappearing from the Earth. As it is called the 6<sup>th</sup> mass extinction it can be surmised that this has occurred 5 times prior. Those times were the result of catastrophic events that altered the planet’s environment. Such as volcanic activity or a collision with an asteroid. The 6<sup>th</sup> time will be different because “scientists say it’s caused by humans.”<sup>4</sup> Habitat loss, climate change, and pollution are combining to endanger and in fact eliminate species from the world. The call for stewards has never been better stated than by Dr. Suess in *The Lorax*, “UNLESS someone like you cares a whole awful lot, nothing is going to get better. It’s not.”<sup>5</sup> We need to make the younger generation care a whole awful lot.

### **Ancient Wisdom**

So where should we look to best understand how to serve the planet? Indigenous peoples are the original inhabitants of an area and their descendants. Indigenous communities existed in the region prior to its colonization from another community. In Delaware and throughout the states, they are often referred to as Native Americans. These people have long had a strong association with the natural world. Their traditions and beliefs have been passed down over the generations. Many of these beliefs are far different than the prevalent modern-day views on the environment and the role of humans in an ecosystem. These same beliefs could also aid in the development of future stewards of our environment.

## The Web of Life

“Man did not weave the web of life, he is merely a strand in it. Whatever he does to the web, he does to himself.” These are the words of Chief Seattle. A chief of the Duwamish tribe for which the city in Washington state is named. Chief Seattle expressed his peoples’ belief that humankind is not greater than the world, or any other creature or plant in the world. Further he foretold that whatever man does to our home, he ultimately does to himself. This sentiment is radically different from modern beliefs. Modern beliefs seem to reveal that man has the right to take and take and take whatever is desired from the land. And, that man does not have to give back to the land. These modern beliefs have placed the world in a precarious position. For if the web as a whole is destroyed so too are each of the strands that belong to that web, including humanity. Conservationists and environmental scientists have come to understand this and are trying to make a difference for the sake of the entire ‘web’. One person who understands this philosophy is Jon Waterhouse, a scholar on Indigenous people. He states that “The future of our planet lies in indigenous ways of living on the Earth. As a global community, we have lost our way, we forgot what it means to have a relationship with the land.”<sup>6</sup>

## Relationships

A cornerstone of Indigenous beliefs is that the land, the plants, the animals, and the humans all have a relationship together. The modern view of this relationship sets man apart from and even above all other living things and the land itself. This belief leads to an unsustainable use of natural resources. For example, the seas are overfished because man can do it and mankind believes they have the right to do so. Trees can be harvested faster than nature can replace them. In seminar, we discussed how the Indigenous belief is that all lifeforms stand on equal footing, and that man is actually the youngest of Earth’s creatures.

Our view of animals and plants is readily observable when we listen to someone speak of them. A bear is referred to as ‘it’. A fish is referred to as ‘it’. A lion (the king of the beasts) is referred to as ‘it’. So too is a tree, a flower, or an herb. Just as a hammer, or a car, or a house are referred to as ‘it’. With the simple application of the word ‘it’, animals and plants are equated to things that people use as they see fit. That two-letter word makes it so easy to harvest these plants or animals. After all, ‘its’ are things that are for us to use. The only animals that seem to rise above the classification of ‘it’ would be our pets. These animals are not lumped together with things, they are often considered parts of the family. Our cats and dogs do teach us that animals have feelings and value. They can do this because we choose to have a relationship with them. Pets may teach us lessons. But if we really looked, we may find that other plants and animals have lessons to share as well.

Indigenous cultures often learn lessons from the plants and animals of their region. Beans, squash, and corn are known as the three sisters. These crops are highly important to many Native Americans. These three vegetables are planted together. Observing how these plants interact reveals important lessons. Each of these individual plants provides a gift to the other. The corn grows straight, strong, and tall. The long stalks provide a structure for the vines of the beans to climb, allowing the beans to rise up toward the sun. The squash grows enormous leaves. These leaves cover the ground around the high growing corn and beans. Beneath the leaves, in the shadows, moisture is locked into the soil increasing water for the corn and beans. The shadows also limit the growth of competing plants as they block out the sun at the ground level. The beans also provide for the other sisters. Beans have the ability to convert nitrogen from the air into valuable nutrients for the soil. Beans produce fertilizer. The three plants work in unison to support each other's growth and success, while also ensuring their own growth and success.<sup>7</sup>

## Balance

Native Americans lived in balance with their surroundings. They did harvest plants to create tools, medicines, and food. They used what they needed and nothing more. In this way they maintained a balance with nature. They had enough to thrive and nature was left with enough to reproduce what was harvested. They hunted and killed animals. They used every part of the animal. Balance was maintained. Nature and Humans could thrive together. However, with colonization came new ideas. The idea of harvesting for profit came to the Americas. Harvest as much as is possible and sell what I don't need. Kill as much as is possible and sell what I don't need. "I meant no harm. I most truly did not. But I had to grow bigger. So bigger I got." "And I biggered my money, which everyone needs."<sup>8</sup> Dr. Suess recognized what was happening. He shared the lesson in *The Lorax*. Of course, that lesson was shared in 1971. Almost fifty years later, business is still biggering and biggering, and biggering.

## Our Local Environment

In simple terms, biodiversity is defined as the variety of life in the world. For our purposes, we will focus largely on the variety of life found in and around Delaware. The Delaware Department of Natural Resources and Environmental Control has stated that "in Delaware these living resources are facing multiple threats. These threats include habitat alteration, loss and destruction due to development and poor land-use planning, proliferation of invasive species"...that choke out native species, and pollution and contamination"<sup>9</sup>. Clearly biodiversity in Delaware is endangered. 14 years ago, a large field of grasses, flowers, and other native flora was cleared to make room for Wilbur Elementary. With the plowing under of this ecosystem, away moved many insects, reptiles, birds, and mammals. Where once, cardinals and bluebirds could have soared above the deer and fox, and the butterfly and the bumblebee, life (though not as diverse as before) can still be found and observed. Around our school, students can find

caterpillars, beetles, and the occasional earthworm. My students while initially not fans of insects are still very intrigued by the animals. They are engaged when I pick an insect up and they want to investigate more closely. Every spring, our playground is joined by nesting Killdeer birds. The parent birds keeping watch over the eggs always draws a crowd, which us teachers control and divert to safe distances. Just beyond the playground fence, groundhogs can be seen munching on grasses and ducking in and out of their burrows. The students love watching our natural neighbors. But they have no appreciation of what once was. Perhaps by sharing the species that have moved on while we explore the ones still here, I can alert students to the fact that, unless they care an awful, awful lot there may come a day when the caterpillars, Killdeer, and groundhogs have gone as well. Much like the local fauna, the local flora has changed as well from the days of field and meadow, to the days of school building, playground, and parking lot. Where once wildflowers grew amid the tall waving grass, now, frequently cut grass is the norm. My students are drawn by the plant life that remains. They frequently crowd around (and usually pick) the dandelions, and buttercups. But, much like the animals, the plants could use our help as well. Our local flora and fauna are in need of a generation of stewards.

### **Identifying Flora and Fauna**

Students are highly engaged by animals and plants. They call them bugs, or birds, weeds, or flowers (which is a step above 'it'). However, I feel certain that knowing the names of these living things would increase their connection to the members of our ecosystem. An increased connection could lead to an increase in caring.

My kindergarten classroom has access to a couple of I-pads. There are also a pair of pretty simple to use apps that can aid us in identifying plants and animals around the schoolyard. The first app is called iNaturalist. This app allows the user to photograph flora and fauna. These pictures can then be uploaded to a databank. The app gives the user its 'best guess' as to what the picture shows. Further, the app will also allow the user to see similar species of plant or animal that were observed in the vicinity or the uploaded picture. This app is simple to use and quickly identifies the subjects of photos. Of course, the quality of the photograph dictates the level of success of that identification. iNaturalist offers a scaled down version of the app which would be perfect for younger students. This version of the app is called Seek by iNaturalist. Seek is a somewhat simplified version, but it does offer challenges to the user. An example of a challenge may be to photograph an amphibian or to photograph a fungus. Both iNaturalist and Seek, are connected to National Geographic, the California Academy of Sciences, *Our Planet* from Netflix, and even the World Wildlife Fund (WWF).

### **The Honeybee**

The message of the bees; "Take time to give and to serve."<sup>10</sup>

Although I intend to expose my students to a range of local lifeforms, to be truly effective, my lessons will need a focal point. Our lessons will spotlight the plight of the honeybee. “The bees have always faced dangers from predators, disease, and parasites. But now they face threats from humans as well – from pesticides, loss of habitat, and pollution.”<sup>11</sup> While honeybees may not be a native species, they are certainly a helpful and indeed necessary species that now calls Delaware home. I would assume that if I told my students that the bees were dying off that they would be okay with the situation. This prediction is based on years of experiencing students yelling and panicking whenever a yellow and black insect enters the classroom. Despite the stinger, bees are not aggressive unless provoked. Bees are incredibly important to our world and that message is important for future stewards to understand.

Honeybees are pollinators. Pollinators are essential for some plants to make seeds, and to ultimately reproduce. Without bees “around half the fruits and vegetables in our supermarkets would disappear! Not only that, we would also lose the animals that eat these plants.”<sup>12</sup> While many students would likely rejoice at less vegetables on the dinner plate, we must consider some of the fruits and vegetables that are reliant on honeybees to reproduce. Apples, raspberries, watermelon, almonds and cucumbers are all dependent on honeybees.<sup>13</sup>

Besides the factors listed above, there are other reasons that the honeybees are disappearing. One reason is attributed to farming. Specifically, in the manner that modern farms plant their crops. Traditionally, farmland was a patchwork collection of small farms that grew widely varying crops. This variety was appealing to the honeybees. Small family farms are becoming massive farming operations that specialize in a single crop. Gone is the patchwork of assorted crops. And with them gone are the bees.<sup>14</sup>

To protect our apples, watermelons, and other fruits and vegetables we must support the bees. There are ways that this can be done, even by a child. A simple way to help the bees is to urge family members to buy locally sourced honey. This purchase supports local beekeepers and in turn it supports populations of bees. Another way to help the bees is to plant with the bees in mind. Some plants that bees would gravitate toward are sunflowers, cone flowers, and marigolds. There are many other bee friendly plants. Allowing weeds to come to flower before removing them would also support bee populations. Goldenrod is favored by bees. It can also be used medically by people. A final way to support the bees is to leave open spaces for plants to grow. Every street and parking lot takes space away from plants that support bees.

To reflect back on the lesson from Chief Seattle, the web is created by many strands. These strands need each other to keep the web strong. If we allow the strand belonging to honeybees to weaken, it will weaken the entire web. As go the bees, so goes the people.

## **Teaching Strategies**

This unit will include three sections. The first section of this unit will be called “Nature Around Us”. During this section the students will be introduced to flora and fauna located around the school. I will challenge the class by using several teaching strategies.

### **The Anchoring Phenomenon**

The Next Generation Science Standards (NGSS) recommends starting a unit with an “anchoring phenomenon”. This phenomenon is usually an interesting visual hook that makes students think about some aspect of what will occur in the unit. I will use a YouTube video about a beehive made from Legos and ask the students to consider the contents of the video.

### **Notice and Wonder**

I will guide the students on a hike around the school grounds. During this nature walk we will be noting plants and animals found. I anticipate many of these organisms to be unknown (beyond simply recognizing something as a flower, a bug, or a bird). We will use our classroom i-Pads to take photographs of these plants and animals and identify them through the use of the Seek App.

### **Writing (K-style)**

Kindergarten writing is defined as a combination of drawing, dictating, and actual writing. The most important part of writing in K is the sharing of ideas. My students will be adding the use of photography to the three other components of writing to help communicate their ideas about our natural neighbors.

The second arch of our unit will be “Good Neighbors Get Along”. During these lessons, we will share stories and texts about native plants and animals (several of which will come from Native American cultures). We will also discuss how human activity impacts the natural world. Following are strategies that will aid us in learning about and growing a respect for the animals and plants around us. They will also help us to understand how nature is changed by humans.

### **Active Listening**

During the sharing of stories and non-fiction texts students will be encouraged to be active listeners. I can best forge this type of listener by asking questions of the students to focus their listening. I will also encourage the students to formulate and ask their own questions as they listen.

## Pair Share

Pair Share is a strategy in which students pair up and share their thoughts about a topic. This strategy is highly useful as they are generally relating key details from the readings or discussions and they are also practicing speaking and listening skills which are proscribed by the kindergarten curriculum. In addition, peers can often help highlight bits of information that an individual may have missed in the reading or discussion.

## Compare and Contrast

In this portion of the unit we will also be learning about the needs of native flora and fauna. I will be having the students practice the skill of comparing and contrasting by examining both animals and plants. They will then consider the differing and similar needs of these organisms.

The final chunk of the unit will be called “Stewards are Helpers”. This portion of the activity will focus largely on strategies associated with the scientific process.

## Scientific Process

As we determine how we could best help our natural neighbors, the students will need to make observations, identify a problem, brainstorm solutions, develop a hypothesis, and test their hypothesis. These observations of nature will surely also lead the students to make notices about the changing seasons, which will also allow us to examine patterns in nature.

## **Classroom Activities**

### Lesson 1: Nature Around Us

Nature can be found all around my school. Beyond our classroom window lies a playground. In addition to the requisite swings and sliding boards, our playground also sits amidst a field of grass. Grass is not the only plant that calls the school yard home. It also hosts a few trees and, in the summer, and spring, many flowering plants. The students treasure gathering dandelions and buttercups and bestowing them upon any teachers or other staff they can reach. They also frequently request to transport them home to give to one of their grown-ups, though I have yet to see one of these treasures get through an afternoon in the locker intact. My students have always loved the plants growing outside our classroom window. However, they have no idea what they are seeing, picking, or stomping through during a round of tag.

As engaging as the students find our playground flora, the schoolyard fauna ignites much larger reactions. In the summer and spring, a few times a week a beetle, a fly, or



(brace for chaos) a bee will manage to find its way into our classroom. Early in the school year, an appearance from an insect ignites overreaction. In the presence of a flying insect, the students will duck and cover, or swing their arms and hands to shoo away the bug. Some students come close to panic should that bug appear to be yellow and black. If our visitor is of the crawling variety, students will race to try and stomp it into a smudge on the carpet. I am able to redirect this energy into curiosity by introducing the insects by naming them and introducing them as neighbors. For example, Barry the Beetle and Freddie the Fly are repeat visitors to our room, mostly because the name is attached to any beetle or fly that happens our way. I started naming these insects to minimize the commotion to the educational process when one would appear. As a side effect of naming these insects, I get 3 or 4 visits each recess when I student comes across an ant, a worm, a beetle, or even a bee. Terror and murderous impulses are supplanted by curiosity and an interest to learn more about these creatures. The larger the animal, the greater the drive to learn about it. When the students find a praying mantis, I am summoned to scene every time. Sometimes I'll pick them up and move them to a safer location and a large parade of onlookers join the large insect and myself as we cross the playground. Most springs a pair of killdeer birds build a nest and lay a few eggs under some piece of playground equipment. The students are so excited by this event, that guarding the nest becomes a playground duty that the teachers share. From time to time students line up along playground fence and press their noses to the grating to watch a groundhog 50 yards off take in some sunshine.

Despite the students' interest in the occasional flower, bug, bird, or rodent. They really have little knowledge of our neighbors. This lesson will begin to change that. As an activating activity I will be sharing an anchoring phenomenon with the class. Any nature video could suffice, but I decided to focus on the honeybee as they are yellow and black, they fly and buzz, and they interject the most chaos into a K classroom. I googled beehives and found a YouTube video about a beehive made out of Lego bricks. I find this dichotomy of Legos and bees interesting since children love one of those things very, very much and distinctly do not love the other very, very much. I will invite the children to engage in a notice and wonder activity during the video. They will have to watch the video carefully and be prepared to share one thing they noticed during the viewing, or one question that they wondered about at the end of the video.

The following class period, I will lead the students on a nature walk around the school grounds. They will be placed into teams and each team will be sharing an i-Pad. The teams will be challenged to use the device to photograph plants and animals that they observe as we explore our natural surroundings. Upon our return to the classroom, I will demonstrate to the students how to use the Seek app by iNaturalist. This app will identify the organisms that the students photographed. The students will then choose one organism and complete a sentence starter with that organism. The sentence starter will be something along the lines of 'I see a \_\_\_\_\_.' The students will be challenged to add a detailed drawing to their writing.

## Lesson 2: Good Neighbors Get Along

In lesson 2, I will be focusing on teaching the students about the needs of animals and plants. Primarily we will focus on the needs for food, water, and space, as well as sunlight in the case of plants. After generating a list of what our natural neighbors need to survive and thrive, I will show the students pictures of wilderness or rural areas. I will challenge the students to study the images and find places where the animals and plants may be successful. After this first round of “Where’s Waldo-ish” fun, I will present the class with images featuring urban areas, suburban sprawl, and sites of industry. They will then search again for things that would meet the needs of the animals and plants.

Following up this introduction I will ask the students to share their opinion to the question; “Are we doing a good job of getting along with our natural neighbors?”. I’d anticipate a fair number of responses in the negative. We will then discuss a community of people that have a history of being good neighbors to nature; Indigenous people. Using ideas found in the content above and gleaned from the resources at the end of this document, I will demonstrate a different way to ‘get along’ with the animals and plants that share backyards and open spaces in and around neighborhoods and schools.

As a class, we will focus on ways we can live alongside our neighbors like Barry the Beetle, Freddie the Fly and even Barkley (our classroom tree that grows at the school). Taking cues from indigenous wisdom, we will develop a plan for living in harmony with nature.

## Lesson 3: Stewards are Helpers

Can we do more than just get along with our neighbors? Could we actually help nature? In our final lesson, we will focus on steps that we can take to help plants and animals around us. We don’t have to be just ‘good neighbors’ we can be stewards. And stewards are ‘great neighbors’ to nature.

It would be a very large challenge indeed to come up with a plan to help all of our natural neighbors, so I will be narrowing our focus to the honeybee. Through the use of non-fiction grade-level appropriate texts, we will determine the needs of honeybees. We will also come to understand the challenges that being our neighbors tend to cause these insects. I would like the students to also gain an understanding of the important job that honeybees and other pollinators do that helps people greatly.

Following a study of the bees, students will be challenged to collaborate and develop a way that we could act like stewards and do something to support the nature that shares our environments. I will ask the students to focus on one challenge that faces bees, and to come up with a plan that could help them tackle that challenge. I anticipate (and if necessary, guide the students to) coming up with the idea of planting plants that attract

and support honeybees. With administrative approval, I would like to actually sow some of these plants and observe them from a distance (they are bees after all and it may be asking a bit much of our school nurse to take a field trip too near bees, as necessary as they are) to determine if bees are visiting our ‘garden’. If we are successful in supporting bees, we can look for ways to improve our efforts. If we are unsuccessful in drawing out bees, dive back into the scientific process, make some changes to our plans, and try again. Once the students have gone through the process of studying about bees, and developing a plan to meet the needs of bees, they should be able to support other plants or animals around their homes.

## **Appendix A: Standards**

### Common Core State Standards

RI.K.1 and RL.K.1: with prompting and support, ask and answer questions about key details in a text.

This is a very broad standard that will easily be addressed as we read fiction and non-fiction texts throughout the lessons.

RI.K.3: with prompting and support, describe the connection between two individuals, events, ideas, or pieces of information in a text.

As we will be reading multiple texts on the topic of honeybees, there will be ample opportunity to connect the concept of one book to another.

RI.K.4 and RL.K.4: with prompting and support, ask and answer questions about unknown words in a text.

Building vocabulary is an important part of developing reading comprehension. Non-fiction texts of which we will be using a few, offer excellent opportunities to interact with potentially new words; like hive.

W.K.2: 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.

The students will be involved in writing about their observations following our nature hike.

SL.K.1: Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and large groups.

This is another exceptionally broad standard that will be addressed multiple times throughout this curriculum unit.

#### Next Generation Science Standards

K-ESS2-1 Crosscutting Concept: patterns in the natural world can be observed, used to describe phenomena, and used as evidence.

The students will be observing patterns and connections found in nature throughout the experiences.

#### **Appendix B: Remote Learning**

This unit was developed with the intention of implementation in a traditional face-to-face classroom setting. However, the teaching strategies found within the unit can be adapted relatively easily to work well in either a heavily restricted or hybrid face-to-face setting or even teaching that is conducted virtually or remotely.

The intended anchoring phenomenon will be presented as a video and then discussed as a class. Use of video clips and discussion will not be greatly hampered in any of the three educational settings listed above. One minor adaptation that I would recommend if engaging students in discussion remotely would be to utilize break out rooms with a smaller number of participants in each when compared to the whole group. The smaller groups will allow for smoother discussion and provide more share time to each student.

The initial lesson of the unit called for a nature hike around the school grounds to explore nature and document observed flora and fauna through the use of classroom i-Pads. Should the school be operating in a hybrid manner with extensive guidelines on spacing children and minimizing shared materials, the plan could be adapted. The actual hike would fall well within social distancing guidelines as teaching outdoor has been encouraged. An issue that I foresee is that my class supply of i-Pads is limited. Initially, small groups of students would share the devices so that each child will have the opportunity to document the journey. With the sharing of devices frowned upon in a hybrid setting, I would suggest taking multiple, shorter hikes around the grounds with different children assigned as photographer for each hike. This would allow every student equal opportunity to use our technology, and also provide additional opportunity to learn outdoors. The hike will change greatly in a virtual learning situation. I would assign the hike as a homework assignment and suggest that parents and students take the walk together. I would also suggest that parents take or allow the child to take photographs on the walk to document what they observe. These photographs could be electronically sent to school email and then uploaded into a future document to be shared. I imagine that student would love having their photographs shared during class.

The use of Seek by i-Naturalist would also need to be adjusted for either hybrid or remote. Seek will be loaded onto the classroom i-Pads for student use. Adjustments for hybrid would match those written of above. Students would have to take turns using the technology as passing a device from student to student may not be viable in a hybrid setting. Using Seek remotely could work in a couple of ways. As students submit pictures from their walks through school email, those photos could be submitted by the teacher and identifications could be made. The goal of attaching names to the plants and animals observed could be met in this way. I would also inform parents that they could also download the free Seek app and use it with their child for identification of observations. I would highly recommend stressing that this would be an *option* for the parents, not a requirement.

Kindergarten writing is relatively similar whether face-to-face or teaching in a hybrid manner. The process of writing is also the same remotely. However, extra steps are needed for students to submit an assignment, or for the teacher to provide feedback to the students on their writing. My school district recommends that primary students use a program called Seesaw for receiving, completing, and turning in assignments. Older students can do the same through Schoology or even Canvas. There are many platforms for submitting documents and receiving feedback on work. Most of these programs ask students to scan a picture of their work and then upload it to the teacher. The teacher then provides feedback on the work and the student receive this information back.

This unit includes many opportunities for students to work together in small groups or team up for a pair/share activity. Whether they are discussing learning, predicting what may happen or sharing observations and ideas, they will need to talk in small groups or pairs. In a traditional face-to-face classroom small group and partner work is a routine that is returned to over and over throughout the day. In both the hybrid heavily restricted classroom and the remote classroom, this routine needs to be adapted. Both remote and hybrid scenarios have the students working through the use of technology. In my school, students either have Chromebooks or i-Pads. They have become proficient at using Zoom as a classroom platform. Zoom allows for the use of breakout rooms into which I can assign groups of students. In this way, team or partner work can continue.

Although, traditional face-to-face, hybrid, remote teaching are all different, all three scenarios of learning can successfully implement this unit. Whether in the school or at home, students can gain an appreciation of the natural world, and take the first steps towards being a steward or nature.

## Resources

- Climate Change Evidence: How Do We Know?" NASA, NASA, 6 Oct. 2020, [climate.nasa.gov/evidence/](https://climate.nasa.gov/evidence/). Data on global warming and climate change.
- DePasquale, Nicholas A. "Foreword to Our Natural Legacy." *DNREC Online*, [www.dnrec.state.de.us/Biodiversity](http://www.dnrec.state.de.us/Biodiversity). Useful site to learn about biodiversity in the state of Delaware.
- "Everything You Need to Know About Native Gardening." *Delaware Today*, 24 Feb. 2020, [delawaretoday.com/life-style/home-garden/tips-for-native-gardening-delaware/](https://delawaretoday.com/life-style/home-garden/tips-for-native-gardening-delaware/). Offers tips on what to plant and why those plants are beneficial.
- KIMMERER, ROBIN WALL. *BRAIDING SWEETGRASS: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*. PENGUIN BOOKS, 2020. This book opened my eyes to many philosophical differences between my view and those held by some indigenous natives with regards to the natural world.
- Kottasová, Ivana. "The Sixth Mass Extinction Is Happening Faster than Expected. Scientists Say It's Our Fault." *CNN*, Cable News Network, 1 June 2020, [www.cnn.com/2020/06/01/world/sixth-mass-extinction-accelerating-intl/index.html](https://www.cnn.com/2020/06/01/world/sixth-mass-extinction-accelerating-intl/index.html). Provides information on the 6th extinction and lays the blame at the feet of humans.
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<sup>1</sup> The Guyana Chronicle. [guyanachronicle.com/2020/07/12/our-responsibility-as-stewards-of-the-environment-2/](http://guyanachronicle.com/2020/07/12/our-responsibility-as-stewards-of-the-environment-2/) (Accessed October 10, 2020)

<sup>2</sup> Environmental Protection Agency. [www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials](http://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials). (March 13, 2020)

<sup>3</sup> NASA. [climate.nasa.gov/evidence/](http://climate.nasa.gov/evidence/) (October 6, 2020)

<sup>4</sup> Kottasová, Ivana. *The Sixth Mass Extinction is Happening Faster than Expected. Scientists Say it is Our Fault*. [www.cnn.com/2020/06/01/world/sixth-mass-extinction-accelerating-intl/index.html](http://www.cnn.com/2020/06/01/world/sixth-mass-extinction-accelerating-intl/index.html) (June 1, 2020)

<sup>5</sup> Suess, *The Lorax*, 58.

<sup>6</sup> Laman, Tim. *Indigenous Peoples Defend Earth’s Biodiversity – but They’re in Danger*. [www.nationalgeographic.com/environment/2018/11/can-indigenous-land-stewardship-protect-biodiversity-/](http://www.nationalgeographic.com/environment/2018/11/can-indigenous-land-stewardship-protect-biodiversity-/).

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<sup>7</sup> Kimmerer, Robin Wall. *Braiding Sweetgrass*, 129-134.

<sup>8</sup> Suess. *The Lorax*, 49.

<sup>9</sup> DePasquale, Nicholas A. *Foreword to Our Natural Legacy*.  
[www.dnrec.state.de.us/Biodiversity](http://www.dnrec.state.de.us/Biodiversity).

<sup>10</sup> Buffalo Horn Man, Gary. *Dancing Otters and Clever Coyotes: Using Animal Energies, the Native American Way*. 45.

<sup>11</sup> Woolf, Alex. *You Wouldn't Want to Live without Bees!* 23.

<sup>12</sup> *Ibid.*, 5.

<sup>13</sup> Markle, Sandra. *The Case of the Vanishing Honeybees: A Scientific Mystery*. 6.

<sup>14</sup> *Ibid.*, 16.