

# The Chuska Mountains on Navajo Land

Keeping Diné Traditions by Learning about the Forest

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## **Context and Rationale**

My parents and grandparents wanted me to get an education at a young age so they placed my older sisters and me in a Bureau of Indian Affairs Boarding School. My grandma was a very strong and determined woman who had it in her mind that my sisters and I would get a good education. She would talk to me about how important it is to go to school. I hated school. I wanted to be home around the sheep and cattle. I loved drawing pictures on the sandstone in Coyote Springs where I grew up. I was not very interested in leaving home to go to school.

I grew up near red sandstone cliffs that are about 150 to 200 feet high and only four miles from Many Farms, Arizona. In this place I had the opportunity to run and be free. I stacked rocks and counted with my sisters. We also collected herbs, built sheep corrals, and tended the peach orchards. I learned how to climb and dig for water in the sand after a rainstorm. My sister taught me how to write my name and draw stars and animals. I recall my childhood adventures to be an amazing part of my life. Still, discipline was a big part of growing up.

I ran away from the boarding school more than twice. Each time, my father would drive me back and drop me off. As the years went by, I began to enjoy school. As far as I remember, this change happened because the pictures in books made me want to travel to faraway places and explore and I began to see that being educated would help me be able to travel.

During school breaks I would return home to grandma's hogan. I would lay on her couch and listen to her sing and tell our traditional seasonal stories. My grandma's favorite story was about the Long Walk. The Navajo people that made it home were very highly respected. The Long Walk was the name we gave to the forced march of Diné people when they were removed from their land by the U.S. Government in 1864. Today, the Long Walk stories are a part of our teaching curriculum in Navajo and Culture classes at most schools on the reservation.

From where I grew up the Chuska Mountains are only a few miles away and can easily be seen. Today I work near the Chuska Mountains. I teach third grade and enjoy the beautiful mountain scenery from my classroom window. There are many traditional stories about these mountains. I am proud to be a Ba'Olta'I (teacher). As an educator I carry on our stories and songs to assure that they are passed from generation to generation.

Indigenous people blend traditional and modern ways of teaching. It is important to teach our students our stories so that they know where they come from and learn our traditions. It is equally important that we teach our students about current issues that directly affect our community, like climate change. The Navajo Nation is mixed with desert, alpine forest, plateaus, and sacred mountains. Many changes are taking place within our Nation. We are faced with an increasingly dry climate. The winter snow is decreasing, and we can see the direct effects of this in our year-round mountain streams. Additionally, the rangelands that are available to Navajo families to graze livestock have been decreased by local tribal guidelines.

The Chuska Mountains are important to me and our people. It is important to raise our children to connect to these mountains so they can appreciate and have a sense of pride toward them. They need to learn about how the land is changing and how they can help protect these sacred mountains. My third-grade students will have the opportunity to explore the Chuska/Lukachukai forest and to identify ponderosa pine, spruce, fir, oak, and willow trees on the nearby mountains. I hope that this will help them understand our environment and will lead them to want to protect it from the effects of climate change.

### **Content Objective**

Navajo People teach songs and stories together in the classroom. The majority of educators on the reservation are Navajo. We study the earth, sky, animals and people in our cultural class. Our cultural teachers tell us how to protect the forest for the next generation. Students need to address current environmental issues that affect their communities. In this unit students will use real life issues that focus on climate change. Students will develop an appreciation and understanding of the physical and emotional issues concerning climate change. To study climate change, my class will learn about a variety of trees from the Chuska Mountains. We will think about how to change the local forests into healthy forests for all living things and for the spiritual health of the community.

In this unit my primary objective is to educate students on climate change. My lesson will be on trees. Trees enhance climate education in the classroom. Teaching students about preserving trees for future generations will also lead them to have respect for our elder's way of living with nature. The lesson will inspire Navajo children to feel that their culture, land, and all living beings have a significant value to their daily lives.

My students will learn about the trees in the forests by using real resources, pictures, facts, and ideas outside the classroom. These teaching methods will inspire them to appreciate nature. Students will have the advantage of asking questions and by learning in a hands-on way by using trees to make arrows and weaving tools and by exploring ways of making herbs.

The Navajo Nation Department of Education has developed a curriculum for local schools and has introduced new research for student learning. It also integrates lesson plans with the western sciences by addressing biology, geology, math, social studies, along with Diné language and arts classes.

I hope this curriculum will inspire all young Navajo students to pursue a career advocating for action in climate change and will work to protect the trees on the Chuska Mountains. I would like my students to understand my deep concern about climate change issues. I would like to push all teachers, students and community members to continue to promote learning about nature and culture.

### **Teaching Strategies**

## Lukachukai Community

Lukachukai Community School serves approximately 176 students in kindergarten through eighth grade (*Public Schools Within 5 Miles of Navajo Route 13, Lukachukai, Az 86507*, n.d.). The percentage of students that achieve proficiency in math is 33% (lower than the Arizona state average of 42% for the 2016-2017 school year). The percent of students that achieve proficiency in reading/language is 39% (also lower than the Arizona state average of 42%). Nearby schools include Many Farms High School, Tsaile Elementary, the Rock Point Public Schools, and Cove Day School. In the fall of 2022, construction on the new Lukachukai Community School will be completed with various facilities including K-8th Grade classrooms, a student dormitory, staff housing, a bus maintenance facility, and a community fire station. The new construction is on a 44-acre site surrounded by the beautiful Chuska Mountain range. The school is designed to reflect Navajo culture and values. This new school will have modern facilities with healthy learning environments and ample daylight and plenty of outdoor learning opportunities for students (*Final Lukachukai Site Animation VI*, 2020).

## History

The Chuska Mountains are located in Northeastern Arizona and Northwestern New Mexico. Roof Butte is the highest point in the Chuskas. The mountain range reaches 9,465 feet and much of it is forest. Logging was operated by the tribe beginning in 1994 and was later suspended by an environmental group. This group wanted to preserve the old forest and traditional sites in the Chuska Mountains.

Our ancestors gave us a world view of how to live in peaceful coexistence with nature. The Navajo people, known as Diné, sing and pray about walking on Mother Earth and connecting with the universe through our holy being. We acquire wisdom through all elements such as water, fire, and animal and plant life. Through traditional and cultural teaching, the Navajo Nation education system is continuing to work toward self-reliance, focusing on sustained development in our communities. Our leaders use their experience and wisdom to act in the best interest of Diné people. We all need to work together to protect our traditional values.

In this unit students will participate in learning how to protect their local mountain, Lukachukai Mountain. Students will apply their self-knowledge, empowering them to make changes in climate change issues. Throughout this unit, students will be given more time to learn by working through various activities concerning environmental changes that affect trees. Students will write out plans and use templates to aid in their understanding.

## Our Natural Resources and Climate Change

We will build a hogan (a traditional Diné hexagonal house) and students will develop a plan on where and how much forest resources are required to build a house. Our community has relied on the Chuska Mountains for many years. Because of the drought, many ceremonial plants, trees,

herbs and seasonal rituals are out of balance. Years of drought have disrupted the ecological system.

The third graders in my class will make a plan to oversee the natural, cultural and economic resources that are found in the forest. We will work towards bringing the Navajo people together to work on solving the problems that are happening to our land. All living things are affected by climate change. In the journal, *Science of the Total Environment*, Dale et al. explains, “climate changes affects both directly and indirectly through disturbances” (Dale et al., 2000), p. 201). Research says that climate change is predicted to affect forests. Changes in productivity, carbon sequestration, water, as well as how people interact with the forest are all impacted by climate change.

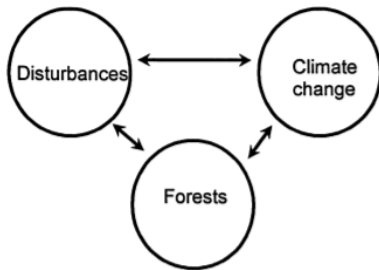
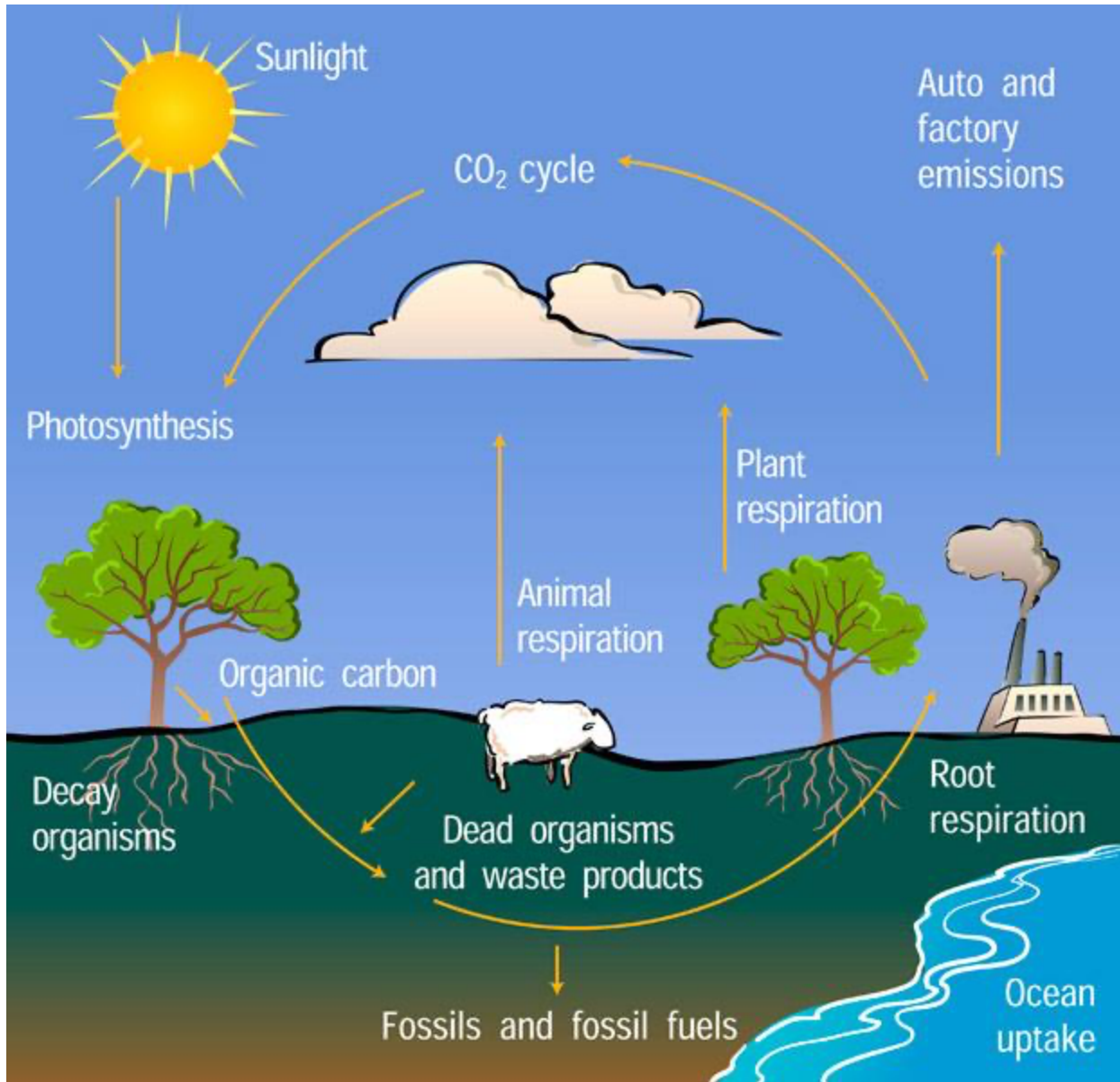


Fig. 1. The interaction between climate change, disturbances, and forests.

## Forestry Unit

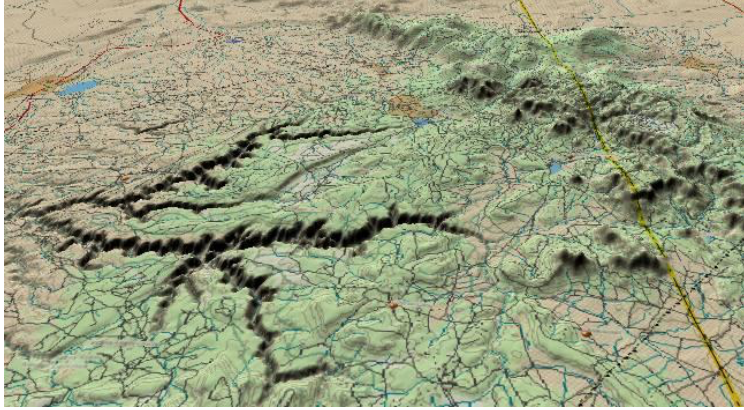
What are the issues when we talk about the effects of the climate crisis on the reservation? When we look at the empty fields, we can see that most of them lay fallow because of the drought. Native American communities have been dealing with a decrease in the amount of precipitation for the last 20 years. The small communities surrounding the Chuska Mountains used to be known for their agricultural industry. This summer the lake, a reservoir that is used for farming, completely dried up. Our beautiful Chuska Mountain lakes and rivers are disappearing. The forest needs water and this resource needs to be protected.

In addition to the loss of water, Navajo families have allowed overgrazing to happen in the forest. The overgrazing of sheep, cattle and horses contribute to poor forest regeneration. In my unit, I will teach students how forests can have a big role in mitigating the effects of climate change and we need to protect them. Forests act as a solution for our gas emissions. Our forests can be a stabilizing force in the climate. Forests regulate ecosystems, protect biodiversity, and play an important part in the carbon cycle.



(Carbon Cycle Diagram, n.d.)

The Navajo Nation has forests on the Chuska Mountains and Defiance Plateau which is also called the Defiance Uplift and Defiance Upward. The eastern boundary of the uplift is a monocline near the Arizona and New Mexico border. The Chuska Mountains run northwest to southeast along the border on the right side of the picture below. Canyon de Chelly National Monument is on the left side of the picture.



(Butler, n.d.)

The rivers and streams on the uplift follow a path to lower elevations. One of these streams that develops in the northern end of the mountains is called Tsaile creek. This creek has created the Canyon de Chelly National Monument.

In 1981, a study on Navajo Nation forestry identified serious concerns in the forests of the Chuska Mountains and Defiance Plateau. For many years our nearby mountains have been logged without any attempt to mitigate damage, or at replanting or regenerating the forests. In 1991, these practices were still not being addressed so a group of concerned citizens came together to advocate against timber cutting. Diné CARE was formed and challenged the Navajo Nation government to protect the forest.

Why is the Chuska-Lukachukai Forest Important?

The forest is home to many living things. We need to understand the condition of our forests and begin to plan how we can help restore them from the effects of logging. Local community members living close to the land, ranchers with sheep, cattle and horses, and the use of ceremonial sacred herbs are all part of the restoration process. While the forest was negatively affected by logging, cutting trees down also helps maintain a healthy forest. We need to learn how to restore and regenerate our forests in the right way by having a healthy process for logging and regeneration. While teaching, I will ask my students, “What type of plan do you think our local chapters offer and do you think our Navajo government has a plan to protect endangered species, as well as the archeology, and our sacred sites?”

As a third-grade class, we can focus on the poor condition forests on the Chuska Mountains by using trees as our primary measurable objective. Students will learn how to identify ponderosa pine and mixed conifer forest structures which have been replaced with aspen and oak trees. The restoration planning will involve using samples of tree measurements. Student planning will include cultural resources, wildlife habitat protection, land use planning, and recreational development. Other issues like abandoned mines and technology approaches will be applied to student learning. Overall, students will be taught directly and indirectly about climate change while comparing diverse and monoculture ecosystems (Eagrovision, 2021).

## **Classroom Activities**

### Activity One: Build a Hogan

My third-grade students will use a variety of trees from the Chuska Mountains. They will use their background knowledge to identify different trees and show their skills in building a Navajo hogan. I will ask students what type of tree, what size, how old is the tree, and what color trees are best for building a hogan. A hogan is a sacred dwelling with one room with eight sides. Most hogans are used primarily for ceremonial purposes.

#### Concept One: What is a Forest?

Students will learn tree identification and the different parts of a tree.

#### Concept Two: Vocabulary

Students will learn the definitions of ecosystems, interrelationships, forests, and humans. We will work with materials like Chizi (wood), mud, and white bulletin paper. We will also read *Ponderosa Pete*, a book written by Julie Black Gidley.

#### Diné Teaching Standards

*Concept One: K'èzhni d zin dooleel*

I will express critical thinking to establish relationships with the environment.

Arizona Department of Education: Arizona Science Standard 2018

*Life Science*

L2: Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.

### **Activity Two: Group Story and Measurement**

Students will learn how trees provide shelter, designing and building a hogan, and sustainable and environment-friendly features of hogans. The duration of this lesson will be three to five days.

Students will pair off in groups of three or four. Using the story *Ponderosa Pete* as a model, groups will make a story that begins, "I was born in 1676," (Gidley & Northern Arizona University. Ecological Restoration Institute, 2007). Student's stories will describe who they live with in the forest, the types of trees and shrubs they live near, if they have enough sunlight, if the biodiversity in the forest is high, and if it is difficult growing up in the forest.

Students will do a second activity in this lesson that measures tree length. They can use a ruler, inch tape or other methods to measure the length. I will ask them, "Do Navajo families still use an axe to measure for length?" I will explain that height is the measurement of the tree from its base to its top or from its head to its toe in the same unit. Students will measure four different trees in the Chuska Mountains for hogan building. They will decide if they need longer trees, whether to cut the trees into halves, or should use short trees that have a bigger diameter.



We will then build trees out of construction paper. Each student will make their own forest diorama. The dioramas will be shared with the community.

### Navajo/English Vocabulary

While making the dioramas, I will teach my students the following Navajo words: Naaki (two), taa' (three), dii' (four), Ligaii (white), litsooi (yellow), lizhini (black), lichii (red), and the words for tall, short, big, skinny, color, and smell.

We will also focus on the following vocabulary terms: biodiversity, surface fires, pine tree, ponderosa, aspen, fir, willow trees, young, old, understory plants, truffles, measurement, height, length, units, feet, inches, dimensions, width, and number.

We will use the following materials: construction paper, glue, ruler, tape, and 2x3 bulletin paper.

### Diné Teaching Standards

*Concept 4: T'aa altsoni baa aheehwiindzin*

I will understand and appreciate all things.

PO 3. I will identify and appreciate the teaching of life surrounding the home.

Arizona Department of Education: Arizona Science Standard 2018

### *Life Science*

L2: Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.

U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of various phenomena. As new evidence is discovered, models and theories can be revised.

### **Activity Three: Investigation of the Importance of Forests**

We will focus on making a connection between forests and humans, the role of the community and what it means to have a sustainable forest, and how forest management is needed.

Students will be able to comprehend how everyone in the community needs to participate and work towards having sustainable forests. Students will share with their family the importance of forest management.

We will have a discussion using *Ponderosa Pete*. I will ask students, "Are surface fires good for healthy forests?" We will read from *Ponderosa Pete* where Pete says, "But I'm worried because the surface fires that used to keep our forest healthy are growing into dangerous crown fires" (Gidley & Northern Arizona University. Ecological Restoration Institute, 2007), p. 27). The class will then discuss whether crown fires destroy homes and Navajo herbs, and ceremonial sites. I will ask students, "How can we fix forest fires?" We will discuss forest restoration after a wildfire.

After we have a discussion about fire, I will ask students, “Is it good you are using Chizi (wood) from the mountain to build your Hogan? Will this help in forest restoration? Will cutting down the skinny, sick trees leave more room for healthy trees? Do you think we need to tell the community that it is important to have prescribed fires?” And we will talk as a class about how to use fire as a forest management tool. I will also mention how we need to recycle nutrients back into the soil and make room for new trees to grow. This is called restoring the forest.

Next, students will make a poster for the community. In groups of three or four, students will draw a picture about carbon dioxide. They will describe how important carbon dioxide is for all living things. An example of how they could show this in a drawing is to draw animals in the Chuska Mountains breathing out and releasing carbon dioxide into the air. They could also draw native plants that produce fruit and how these plants use carbon dioxide. Plants make their food in a process called photosynthesis. Plants help animals breathe because plants take in carbon dioxide and release oxygen. The students’ posters will be displayed so that the whole community can see them. It will make the whole community more aware of the carbon cycle and forest restoration when they look at the student posters.

Through the making of these posters, students will learn the following vocabulary: carbon dioxide, living things, animals, air, Native plants, producing, releasing, breathing, restoration, surface fires, prescribed fires, crown fires, sustainable forests, dangerous, and soil.

I will share the Navajo creation story (Nihaltsoh) with the students. This story talks about the third world (the yellow world) and about different animals like squirrels, chipmunks, turkeys, deer, and lizards living on the sacred mountains. I will discuss with the students how the water rose higher than the mountains and how the first man planted a cedar tree and how it did not grow higher than the water. The first man also planted pine trees, but the pine trees were too short.

The materials we will need for this lesson are poster boards, markers, and vocabulary words.

Diné Teaching Standards

*Standard: K’ehwiinidzin doo adahozdilzin bee hadinisht’ee dooleeligii bohwiideesh’aal.*

I will develop and apply critical thinking to establish relationship with the environment.

Arizona Department of Education: Arizona Science Standard 2018

*Life Science*

L2: Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.

U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.

#### **Activity Four: The Future of the Chuska Mountains**

As a class we will review the concept of how to Build a Navajo hogan using the right trees. And how to respect the forest, our culture, and our community. This activity will focus on the future

of the forests in the Chuska Mountains. As a class we will discuss ways that we can maintain our forests and how we can help our forests survive the effects of climate change.

Students will discuss their appreciation and future directions for our Navajo Nation Forest with a short essay using this information writing template.

Name \_\_\_\_\_ Date \_\_\_\_\_

### Informational Writing Graphic Organizer



Plan your informative piece by filling out the graphic organizer.

|                     |                  |
|---------------------|------------------|
| Topic Sentence      |                  |
| Idea 1              | Details/evidence |
| Idea 2              | Details/evidence |
| Idea 3              | Details/evidence |
| Concluding Sentence |                  |

(Informational Writing Graphic Organizer, 2017)

## Conclusion

My grandmother always told me, “Use your traditional Diné teachings.” As my way of continuing my grandmother’s teachings I will teach my third graders to use our traditional knowledge as a foundation to learn about climate change. This unit integrates traditional ways of teaching with climate change. Students will develop an understanding of the importance of forests and of animals and humans living in healthily maintained forest ecosystems. This curriculum is designed to increase student knowledge, cultural awareness, and to help our students’ become advocates for their community. The curriculum teaches about climate change and more particularly how climate change affects the communities near the Chuska Mountains. With a few alterations, this unit can be applied cross-culturally and globally.

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