

Student Driven PBL on Navajo Plants & Trees

Wildlife, Plants, and Habitats of the Southwest

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Diné Institute for Navajo Nation Educators (DINÉ)

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Author Note:

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Introduction

Yá'át'ééh. Cheryl Singer dashijini. Dził tà'hii Kinyaa'áanii nishkíigo, Táchii'nii báshishchíín, Tsé deeshgiizhnii da shichei dóó Naakai diné da shináí. Tsé chizh **dah'si'áanídéé' kééhasht'í.** 'Akót'éego 'asdzáan nishkí.

Greetings. My name is Cheryl Singer. I am Near the Mountain of the Towering House clan, born for the Red Running into the Water clan, my maternal grandfathers are of the Rock Gap clan, and my paternal grandfathers are of The Mexican People clan. I come from a place referred to as the “rough rock that stands near a mesa”. Therefore, this is how I identify myself as a woman.

I have been married to Andrew Singer for 40 years now. My oldest daughter is Andrea Singer, she is the mother of our two older grandchildren, Landon and Rylee Hardy. My youngest is Cassandra Conner, she is married to Jeremy Conner and they are the parents of my two youngest grandchildren, Jayden and Elizabeth Conner. As a grandmother, I have instilled in my grandchildren the importance of the Navajo kinship, Ké (the Navajo identity of our Navajo clans). The Ké concept is very important to this curriculum because we must respect ourselves, our relatives and clan relations, and our surroundings. Hopefully you have noticed that my clans above have some type of association to water, rocks and rock formations, and another nationality. For this reason, we need to show respect to other people and our environment. From a very young age I remember being taught the Navajo language by my maternal grandmother, Tillie Begay. Shima sani (my grandmother as she is referred to in the Navajo language) her first and only language was Navajo. She taught me the Navajo names of our local plants and animals, our household items, the objects outdoors, and the names for our environmental surroundings. As I practiced pronouncing these terms and connecting them with the objects I began to understand the explanations that followed and these terms applied to the things in our surroundings. Shima sani would explain the cultural meanings of these terms or phrases and how it applied to me, and our Navajo people. Through her patience with me, I was able to learn the Navajo language quickly. I immersed myself into the Navajo language with shima sani as my teacher.

I firmly believe that my grandma Tillie was teaching me life concepts and that showed how we, as Navajo human beings (the five fingered ones) are connected to everything around us. I would like to share the Navajo language and culture with my students in the same way that shima sani taught me. This style of teaching is also reflected in the “T'áá Shá Bik'ehgo Diné Bi Na'nitin” (Diné teaching style of the cardinal directions planning process of learning) from Office of Dine Culture, Language and Community Service from Window Rock, Arizona.

“A four-part planning process is central to traditional Navajo way of knowing: Nitsáhákees (the process of thinking and conceptualizing), Nahat'á (the process of inquiring, investigating, and experimenting), Iiná (the process of applied learning, accomplishing, producing, performing, and publishing), and Sihasin (the process of making critical affirmative action of thinking, planning, learning, becoming experienced, expert, and confident to adapt). It organizes all aspects of learning and

teaching for children and adults, and reflects the principles for guidance and protection from the imperfections in life; Sa'ah Naagháí and the principles for the well-being and being a whole person: Bik'eh hózhó."

(Office of Dine Culture, Language & Community Services, 2000, vi.)

Context

I reside in Kayenta which is located on the Navajo Nation in northeastern Arizona. In the Navajo language Kayenta is called Tó Dinéeshzee' (pronounced as Toh-Din-Eesh-Zhee) which translates as "water that flows straight". My late father-in-law used to explain that this term refers to the land where farmers would do their planting because there was accessible water. He grew up in the 1940's and our people were known to be very humble and generous. Farmers would help, share, and trade their crops with one another. Mr. Phil Singer, Sr. (my father-in-law) used to tell me stories about how land that the Kayenta School District is now on used to be farmland.

Kayenta is located about 26 miles south of a major tourist attraction, Monument Valley, "one of the natural wonders of the world". According to the "2018 census, the population is 5,512 and the average household income is \$47,391, and the poverty rate of 37.7%. The elevation is 5,700 feet and the area is about 13.24 square miles. English is spoken by 19.34% of the people in Kayenta and 80.57% of the population speaks other languages. ("World Population Review").

In Kayenta, there are three restaurants, several fast food places, three gas stations, two laundry mats, a Bashas' grocery store, an Ace's hardware store, a movie theatre, a Wells Fargo bank, a Post Office, a fire department, a small airport, a medical clinic called the Kayenta Health Center, the Kayenta Township Office (a local government established to empower the concept of community sovereignty on the Navajo reservation), Kayenta Boarding School, Kayenta School District, and the Kayenta Chapter.

Kayenta Unified School District #27 (KUSD) consists of four public schools: a Preschool/Kindergarten, Elementary School, Middle School, and High School. According to the School Profile on the KUSD website,

"KUSD as of May 25, 2022 consists of a total of 1,610 students. The current active enrollment for the Fall School year of 2022 will be - Preschool/Kindergarten at 128 students, Kayenta Elementary School (grades 1-4) at 384 students, Kayenta Middle School (grades 5-8) at 491 students, and Monument Valley High School (grades 9-12) at 607 students. The teacher ratio is 15 to 1. Every day, the district buses transport over half of the student body. Some of these students travel as far away as 60 miles one-way to come to school. Breakfast and lunch are served daily and over 80% of the children are eligible for free or reduced meal." (Kayenta K12).

While working in Kayenta for over 34 years, I have seen many of our students recognized for their academic achievements and for their athletic achievements. Below is a statement that shares this information:

“Monument Valley High School has been continuously accredited for over twenty years by the North Central Association Commission on Schools which is currently referred to as the AdvancEd. Monument Valley High School takes pride in their academics especially in the area of scholarship recipients. Some of the scholarships that the students apply to are Gates Millennium Scholarship, Chief Manuelito, Dell scholarship, Military scholarships, private and governmental scholarships/awards. Nearly 10% of the high school students are enrolled in AP classes for the 2022-2023 school year. Advanced Placement courses offered are AP Literature and Composition, AP Calculus, and AP Biology. (Kayenta K12).

Monument Valley High School’s mission statement is: “The purpose of our school is to graduate students in four years who are literate informed individuals capable of making effective decisions about their lives” (Kayenta K12). Our mission statement is used in our daily morning announcement at the high school and the teachers who teach a first period class always read the morning announcement to their students. The morning announcement also includes upcoming athletic events, student council and extra-curricular club events, students of the month at each grade level, recipients of awards, future guest speakers (e.g., college recruiters, military recruiters, etc.), school exam days and counselor information.

I teach Navajo Language courses (Navajo 1 and Navajo 2) to students of various backgrounds and races from grades 9-12. These courses I teach are targeted for students who are college bound, those who want to apply scholarships such as the Chief Manuelito Scholarship, and for high school credit requirements under the Foreign Language. College bound students need to take both courses to be able to apply credits towards college or university requirements. At Monument Valley High School, these two Navajo Language courses are the only foreign language courses that are currently offered; therefore, the student numbers are quite high (at 25 or more students per class). The following statement is taken from kayentatodineeshzhee.weebly.com, “The most difficult part of the Navajo culture is the language. It is very easy to try saying one word, but end up pronouncing it wrong. The Navajo language is very tonal and descriptive.”

The textbook currently being utilized within the classroom is *Rediscovering the Navajo Language*, written by Dr. Evangeline Parsons-Yazzie and Dr. Margaret Speas by Salina Bookshelf, Inc., the textbook is focused on teaching the Navajo language to secondary level students and college students. This book was created by Navajo language teachers, linguists, and professors. As a Navajo language teacher and participant in the Navajo Language Academy, Inc. with Dr. Margaret Speas in the summer sessions of 2004, 2005 and 2006, I assisted in the development of this classroom textbook. The professors who taught the summer academy were experts in their field and shared their scientific methods on learning the Navajo language, to target the information to secondary and college level students learning the language in a linguistical approach for the proper Navajo grammar structure, and on the methods to breaking down the grammatical components for young learners of the language.

Rationale

The “Diné Terms or Phrases and how it applies to Plants and the Habitat” Curriculum is developed for secondary level students (grades 9-12). It will include the plants that are currently found in the areas near Kayenta, Arizona. The textbook, *Rediscovering the Navajo Language*, has several chapters that will apply to this topic on the plants and habitats including on traditional foods and seasonal plants, planting, and harvesting. Additional information that could be used are the verb conjugation models of “eating it” and “drinking it”.

This curriculum unit will focus on students taking the Navajo 2 course (the advance level class), which deals with the advance level Vocabulary terms and Navajo verb conjugation models of the following modes: perfective mode (past tense), imperfective mode (present tense), and future mode (future tense). As stated in the KUSD School Profile page for the high school “According to the State test scores, 18% of students are at least proficient in math and 22% in reading (Kayenta K12).

This is an indication that our students need some continued guidance with fundamental reading skills. Therefore, my curriculum unit will include the fundamental reading comprehension and vocabulary skills (in Navajo and English).

Vocabulary words for plants in both Navajo and the scientific terms in English will be useful for the students to learn. In Navajo each plant’s name is also a description which illustrates its meaning. The students will learn the English name and the two-part scientific term that incorporates the genus and the specific name of the plant (using the Latin words). The scientific name is universal and is used by scientists because the names cannot be changed except by international scientific agreement.

The reading materials will include information and facts about the plants in the Navajo culture and the western world. These readings will benefit the students when they begin their research task that will be the assessment for this curriculum. For this research assignment, students will be placed in pairs with the task of completing a Project Based Learning (PBL) presentation. PBL is a student-centered teaching method, where students are allowed to investigate and gain knowledge and skills for topics that are challenging. For this curriculum, students will engage with the subject of “Diné Terms or Phrases and how it applies to Plants and the Habitat” through partner collaboration and the sharing of a final product presentation. In this process, students will gain reading, writing, speaking, listening, researching, and presentation skills and learn about a specific type of plant or tree that is local to the Kayenta area.

Some “features” of this will include (a) the Main Title, (b) headings and sub-headings, (c) paragraphs that support the topic information, (d) vocabulary in Navajo and English, (e) in keeping information in sequential order, information should have bullet-pointed lists/ideas, (f) provide photographs and illustrations (which could be student-made drawings called a botanical illustration) with captions, and (g) APA style citations.

This curriculum will include field trips where students will visit the local Kayenta area within the “school community.” These trips, which can be as simple as walking across the street from the KUSD District Offices and Middle School to an open area of land that contains some local plants and trees, will help the students create the plant illustrations. Prior to this field trip, students will be given a picture of a plant or tree that will be the focus of their Project Based Learning.

Each student will also have an additional assignment of their own that will be observed near their own residential area to find the plant that has been given to them for their main topic. This assignment will be to take pictures of and to put them into their final product. This is referred to as the “home community assignment” using the same plant or tree (their main topic). Part of the assignment is to provide similarities or differences between the “school community” vs. the “home community” by providing a Venn diagram for their main topic plant or tree along with the pictures from their own home area plant or tree. This time, the teacher will share information from the reading selections of the “Navajo Nation Range Management Handbook” about the term “Rangeland”: Rangeland—the vegetation, soil, and water—is the Navajo’s greatest and most valuable natural resource. Rangeland has played an important part in the history, the culture and the life of Navajo People. (Parrill, 1981)

For one of the activities, called a botanical illusion, students will draw out their plants in form, color, and labeled with the details of the plant or tree species. Students do not have to be expert illustrators but by putting the designs of the curves, lines, etc. in their drawing will show how they are able to see the details of the leaves, flowers, buds, seeds, roots, etc. By doing a botanical illustration, students will better understand the place where their plant is grown. This assignment also helps students realize the value of their own work. By making their own drawing, an original work of art and not another one like it, students can take ownership and be proud of what they have done.

Content Objectives

Plants and trees are the focus of this curriculum unit. Vocabulary terms pertaining to plants and trees will be shared with students, and the terms will come from the following three resources, “Navajo Nation Range Management Handbook by Frank Parrill”, “Selected Plants of Navajo Rangelands with Navajo names developed by Navajo Tri-State Federally-Recognized Tribes Extension Program in collaboration with New Mexico State University”, and “Nanise’ – A Navajo Herbal by Vernon O. Mayes and Barbara Bayless Lacy”.

Students in the secondary level need to increase their language skills and by using vocabulary words that are relevant to their written work, they will be able to express their ideas clearly and demonstrate their understanding of their topic on a plant or tree. The words used in the student’s final product will show that they understand their content topic.

The students that continue their education at a junior college, college, or university, will need to be able to use the academic language that relates to the content areas they choose to study. The ability to write sentences using the academic language pertaining to their topic will enhance their understanding of the topic and will allow them to be better understood by others in the field.

The Navajo Ethnobotany Project created by the Navajo Health Authority - was created with the goal of providing an excellent explanation for the purpose of studying Navajo plants, trees and their habitats. “It [the Navajo Ethnobotany Project] had a twofold gold: to awaken students’ interest in Navajo culture as well as in the possibility of science careers.” (V. Mayes & B. Lacy, 1989, p. vii.).

Vocabulary Development

The KUSD Dine Language and Cultural Curriculum for Grades 5th to 8th have the Plants which are referred to as Ch'il and Trees which are called Tsin, categorized as follows:

Under Ch'il are: K'ish (Alder), K'aasdá beeyigá nitsaaígíí (Big-arrow-poison antidote), **Dibédaa'** (Buffalo berry), **Awééts'áál** (Cliff rose), Tł'oh nástasí (Foxtail grass), Díwózhiishzhiin (Dark greasewood), Díwózhiilbei (Chamiza or Chamisa), Tádídín dootł'izh (Larkspur), Ts'ah (Sagebrush), Azee' nitł'iní (Globe mallow), **Dahyiitíhídáá** (Desert paintbrush), **Ch'il ahwéhé** (Lesperma gracile, Navajo tea), Ni'hadláád (Ground lichen), Hosh bineest'a' (Prickly pear), K'iiltsoii Tsoh (Golden rabbit brush), Ha'altsédii, **Haaltsédii** (Wild walnuts), K'ailchíí' (Red willow, Creeping dogwood), Tsintł'iz (use it for weaving tools), Tséch'il (Oak tree) Tsin bijeeh (Tree sap), Dahts'aa' (Mistletoe), Haashch'éédáá (Mistletoe), Kétłoh (western thoroughwort), Lók'aa' (Reed), Lé'aze' (Buckwheat), Tł'oh azihii (Mormon tea), Tł'ohchin (Wild onion), Tsá'ászi' (Yucca), **Tsé'ésgizii** (Golden currant), Wóláchiidáá (Wild buckwheat), and Haza'aleeh (Wild celery).

Under Tsin are: Chá'óól (Pinon branch), Deestiin (Pinon Tree), Gad (Juniper), Gad ni'eelii (cedar), N'díshchíí (Ponderosa pine tree), Ch'ó (Douglas fir), Ch'ó deeníní (Blue spruce), and T'iisbái t'iisbái (Aspen). (Diné Language and Culture Curriculum, 2012, pp. 90-91)

Project Based Learning

The curriculum will be about the plants and trees, and their habitats. Students will be able to create a Project Based Learning (PBL) "final product" which will be presented to the class. This PBL final product will be the overall goal of the curriculum. So, what is Project Based Learning? "In one sentence, project-based learning (PBL) is the process of learning through projects. To be a bit more specific, PBL is the process of learning through the design, development, and completion of projects." ("Teach Thought")

The previous Diné Standards (adopted in June 2000) from the book of *T'áà Sha Bik'ehgo Diné Bi Na'nitin dóó Ihoo'aah*, has a clearer explanation that applies to the content objectives for the final product aspect of this curriculum unit.

"Standard 2. Culture – Nahat'á. Culturally knowledgeable Navajo students are able to build on the knowledge and skills of the local cultural community as a foundation from which to achieve personal and academic success throughout life. Diné áłchíní t'áábí ádá nahat'á dooleel dóó t'áábí na'ák'íyálti' dooleel. PO2. apply precautionary measures in educational projects in accordance to understanding traditional concepts of showing respect for nature (e.g., abide by traditional customs and consensus in maintaining cultural values and harmony in performing science projects)." (Office of Diné Culture, Language & Community Service, 2000, p. E-6)

For this curriculum in the Anglo-western way of thinking, the teacher will create a PBL final product to model alongside the student's projects. When teachers are engaged with their students, assisting them with their product and helping them to bring their product alive, it results in a more meaningful experience for both teacher and students. PBL also allows students to be

creative, to put thought into their product, to research and to challenge their minds, and to share a product that is unique.

In the Navajo way of thinking, the Navajo Standards from June of 2000 and Herbert Benally, provide some of the best ways for Navajo thinking for this PBL final product outcome:

“The intention of T’áá Sha Bik’ehgo Diné Bi Na’nitin dóó Ihoo’aah is to weave across the content and process of the children’s educational programs to help them retain and accelerate their learning by using methods, activities and learning style of the children’s family and community. A four-part planning process is central to traditional Navajo way of knowing. It organizes all aspects of learning and teaching for children and adults and reflects the principles for guidance and protection from the imperfections of life; Sa’2h Naaghái and the principles for the well-being and being a whole person; Bik’eh Hózhóón. At the level of processes, teachers and students conceptualize an idea through brainstorming and plan the strategies for implementation. Iiná is the implementation of the plan and Sihasin is making critical affirmation of the processes. The system requires a progressive movement in the sunrise fashion as each content, concept, unit of study is delivered. In this fashion, learning and teaching pattern will become a way of life and a way of approaching new concepts. A foundation in Navajo cultural studies constitutes developing a strong basis for Nitsáhákees, Náhat’á, Iiná, and Sihasin.” (Office of Diné Culture, Language & Community Service, 2000, pp. vi-vii)

Herbert Benally also mentioned that “The traditional concept of a harmonious life required balancing all four categories of Diné knowledge so that the individual will have sound beliefs and values to make the best possible decisions, will possess skills to provide the best living for the family and provide good leadership to the family and community, and will have a sense of reverence for the earth and for all living things and for that which is in the heavens.” (H. Benally, 1987, p. 6)

Teaching Strategies

As a Navajo teacher and curriculum developer for many years, I try to incorporate teaching and learning lessons that contribute to the student’s cultural awareness and knowledge, their understanding of the Diné language. An excellent explanation of this teaching and learning method can be found in the textbook Amà Sani dóó Achei Baahane’. When I develop a lesson plans, I do it with this belief from Amá Sani dóó Achei Baahane in my mind, “It is through heritage culture and language that we need to instill the sense of self, self-respect, the appreciation for origin, and descendant of being the Diné People in our children, so that they too can become aware of their history and place in society as people of character; as lifelong thinkers (binitsáhá’kees ninees doo), lifelong planners (binahat’ánineez doo) with great minds, wealth of knowledge, wisdom, and teachings of language and heritage culture.” (Amá Sani dóó Achei Baahane’, 2004, p. 3).

The Diné teaching strategies that will be used for the PBL final project are based on the foundation of the “T’áá Sha Bik’ehgo Diné Bi Na’nitin dóó Ihoo’ah content planning process:

- I. Nítsáhákees (the process of thinking and conceptualizing),
- II. Nahat’á (the process of planning, inquiring, investigating, and experimenting,
- III. Inà (the process of applied learning, accomplishing, producing, performing, and publishing, and
- IV. Sihasin (the process of making critical affirmative action of thinking, planning, learning, becoming experienced, expert, and confident to adapt).”

(Office of Diné Culture, Language & Community Service, p. vi)

PBL: Student Learning Lessons using the Diné Planning Process

- I. Nítsáhákees – East direction
 - A. Prior Preparation (The way the teacher wants to share in the westernized world and/or the Navajo way of thought).
 - B. Student Objective: Students (in pair partners) will be able to plan, organize, research, create a product, and share with an audience their Topic (which could be a plant or tree).
 - C. A Prior Approval is need for:
 1. Leaving the classroom for a Botanical Illustration by taking a field trip in a designated area on the school grounds or near the campus grounds.
 2. Students are given a Parent Permission form that will need to be turned in to the teacher prior to the scheduled field trip day.
- II. Nahat’á – South direction
 - A. List of Students in a Partner setting of two students per product.
 - B. Partners will be given a card with a photo of a plant or tree to research for their final product. Students will be given some time in the library and on their laptops to look up information about the plant or tree in the picture. Teacher will take pictures at least 1-2 weeks prior to the students going to the location where the plant or tree is located.
 - C. Power Point made by the teacher will show:
 1. Daily Research Days for students to explore through resource materials for their research that are found within the classroom, the library (during library days), or the cultural center library (during cultural center days),
 2. The daily student objective(s) during the week with the Diné Standards and the Arizona Standards will be posted within the classroom.
 3. Lesson Plans (each day or each week) will be written and posted within the classroom.
 4. Required Vocabulary, Reading, Videos, and Teacher Generated Materials will be included within the Lesson Plans.
 5. The how-to instructions for completing a PBL final product and what will be incorporated into their Power Point display will be written in a Student Handout as the guideline instructions for each group to follow to complete their product.
 6. A Power Point display layout and visual examples for students to follow will be in a sample template included in the Student Handout.

7. Student Rubric for an Oral Presentation,
8. The Teacher-made Power Point that will be in the Student's CANVAS (a learning management system being utilized by the Kayenta Unified School District) program, and in the Student Handout.
9. A calendar with the Partner's names for the Final Product Presentation days (Adjustments are sometimes needed due to health reasons, sports, etc.) will be created. The calendar will be a reminder to the groups for their Product Presentation Day and it will be posted within the classroom.

III. Iiná – West direction

- A. Students will check CANVAS for their daily lesson plans, standards, teaching instructions, etc. from their teacher and these will also be posted within the classroom in a hard copy for students to view.
- B. Students check the classroom for the posting of any additional information that may need to be mentioned for this final product.
- C. Mini-Field Trip:
Teacher will take a class period (90 minutes – Monument Valley High School is on a block schedule) field trip across the street from the high school and district office to do a Botanical Illustration.
 1. The day before the field trip: Explain what a “botanical illustration” is to the students and if possible, to put it in to their Power Point slides as additional information if time permits or to share it during class.
 2. Students will need to collect materials for this mini-field trip: colored pencils, lead or mechanical pencil, extra eraser, paper, and a clipboard. A backpack will be needed to put their supplies into it for the outdoor field trip.
 3. Some additional necessities that will be needed are to: wear appropriate clothing wear for the outdoors (e.g., tennis shoes, socks, hat, etc.), and maybe to bring an umbrella (if it going to be sunny).
- D. Personal needs to be accounted for as well, like bringing a water bottle and to have it filled up. Prior to taking the walk, students need to take care of themselves by going to the restroom and having what they need in their backpack. Another reminder would be to take care of mother nature by recycling and not to leave things at the designated field trip area, so by bringing a trash bag and disposing of their trash before returning to the school building would be showing a sign of respect to self and their environment.

IV. Sihasin – North direction

- A. A Student Assessment will be in the form of an Oral Presentation Rubric which students can find in CANVAS.
- B. Presenting on a selected date for the final product: students/presenters will be graded according to the Oral Presentation Rubric and for any additional creative ideas that accompanied their presentation.
- C. Audience participants are also graded for their “listening skills” and in “asking knowledge-based questions” about their classmate's final product presentation.

Classroom Activities

Classroom Activities for this curriculum will be:

- Botanical Illustration which is “the art of depicting the form, color, and details of plant species.” (“Wikipedia.org”)
- Venn Diagram of the plant or tree species to share the differences between habitats and environment.
Home habitat plant or tree life vs. School habitat plant or tree life.
- Additional readings for the Navajo Cultural Knowledge about plants, trees or habitats by reading from the magazine article published by *Leading the Way: The Wisdom of the Navajo People* magazine. The publisher and editor is Kathleen Manolescu of Gamerco, New Mexico.

Botanical Illustration

Prior to the drawing a botanical illustration, prepare your students to a new experience by having them view some tutorials, so they have an idea of their purpose for doing the illustration of the plant or tree. For example: The Botanical Illustration Tutorial, it will show some details and share the importance of their drawing, <https://youtu.be/rB62zZM1cd0>.

Additional activity prior to the observation and drawing of the botanical illustration. Teacher will show visual slides of plants and trees on a Power Point that contains the colors, shades, buds, etc. of the coloring book page. Students will color in the coloring book page with the colored pencils and putting in shades, the colors, the buds, etc. of the plant and tree species to demonstrate the natural picture of the plant.

Content: Students will be provided a photo of their plant or tree and to locate the plant or tree on the school campus grounds to draw with a regular pencil on to a sheet of paper. Color can be added using colored pencils.

Assignment Objective: Students will be able to draw out their plants in form, color, and labeled with the details of the plant or tree species.

Materials: Photo of plant or tree, pencil, sketching paper, colored pencil, clipboard, and partners to help do the drawing.

Areas to focus on are buds, seeds, leaves, color, curves, ripples, sharp areas, length, etc.

Venn Diagram

Students will locate the plant or tree in their surrounding area (near home) and to draw another botanical illustration (sketching for the form, color, and details).

Content Objectives: Students will draw a botanical illustration and to create a Venn diagram with his/her partner(s). Students will share their drawings and to write in a Venn diagram the similarities or differences of the plant or tree from the school environment and home environment.

Materials: Paper, pencils, colored pencils, and Venn diagram worksheet (like the one below).

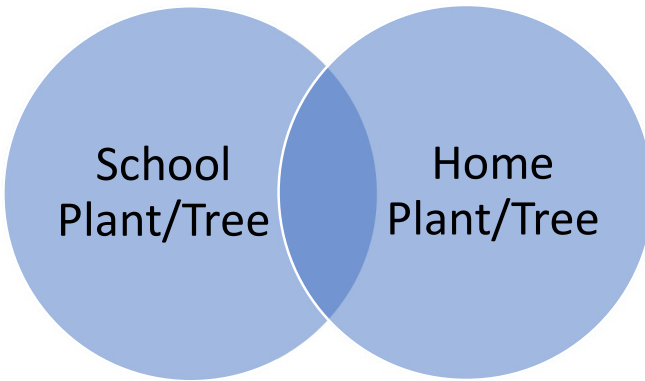


Figure 1

Cultural Knowledge: Magazine Reading

Content: Students will be able to read magazine articles from the *Leading The Way: The Wisdom of the Navajo People* magazines that contain articles on plants, trees and its habitats.

Reading and Writing Assignment Objective: Read the articles and to write an IVF Summary from the Step-Up-To-Writing Program.

Materials: IVF Summary examples (template sample), magazines, pencil/pen and paper.

Information about an IVF Summary: IVF stands for: “I” to Identify by naming the source of information, “V” stands for Verb, and the “F” stands for Finishing the thought (the main idea of the reading). IVF Summary comes from a Writing Program called Step-Up-To-Writing.

Teacher will model some IVF summaries and students will practice the IVF summary writing exercises. When students are familiar with the IVF style and know how to use these acronyms in their first line to begin their summary paragraph, they can then add major supporting points to the main idea.

Here is an example of this IVF Summary using a *Leading the Way* magazine article from the November 2018, Volume 16. No 11. issue of the “Female and male squash blossoms” by Sylvia Leuppe and Bertha Etcitty.

IVF Summary Sample:

The article on the “Female and male squash blossoms” explains the development of the squash blossom. For the squash blossom to produce fruit, it contains a male and female developing stage as it ripens. An illustration of the squash blossom is shown with the flower parts and these parts are labelled in the Navajo language with the English translation, for example: the pollen is called tadidiin. Various insects pollinate the female flowers by collecting pollen from the male flower’s anther and taking it to the female flower’s stigma so that the squash blossom fruit can develop. (Leuppe & Etcitty, 2018)

Below are some suggested readings about trees from the Leading the Way magazines that could be used as IVF Summary readings:

December 2021, Volume 19, No. 12. "Caring for our forests" by Frankie Thompson, Herman Yazzie, Cazzie Thomas & George Skeet.
December 2021, Volume 19, No. 12. "Trees: carbon storage experts" by Melissa Kreye of Pennsylvania State University Extension, September 24, 2020.
December 2021, Volume 19, No. 12. "Human-fire interactions on Navajo forests" by Christopher Guiterman, E. Margolis, C. Baisan, D. Falk, C. Allen, and T. Sweetnam in Ecosphere November 2019.
March 2021, Volume 19, No. 3. "Born on the mountain" by Marie R. Begay.
April 2018, Volume 16, No. 4. "Kinaalda essentials" by Hastiin Beeshłigai.
September 2018, Volume 16, No. 9. "Making Cradleboards" by Robert Alsbury, Sr.
June 2018, Volume 16, No. 6. "Working to protect our natural & cultural resources" by Jason Nez.
May 2017, Volume 15, No. 5. "Working together to support nature & culture" by Chako (Anthony Ciocco).
May 2017, Volume 15, No. 5. "Fort Defiance Soil & Water Conservation District: Preserving & improving what we have" with Wallace Tsosie, Nels Roanhorse, Roger Shirley, Dennis Becenti, and Ivan Joe.
August 2016, Volume 14, No. 8. "Cedar promotes healing" by Asdzáá Ta'neeszahnii.
August 2016, Volume 14, No. 8. "Cedar in Anaa'jí" by John E. Salabye.
September 2016, Volume 14, No. 9. "A working summary of Diné land use values & beliefs" by Kathleen Manolescu and John Salabye.
September 2016, Volume 14, No. 9. "Uses of the cedar tree" by Harry Goldtooth.
July 2015, Volume 13, No. 7. "Nature is all around us" by Nixon Martinez.
July 2015, Volume 13, No. 7. "Plants for healing" by Anderson Hoskie.

Below are some suggested readings about plants from the Leading the Way magazines that could be used as IVF Summary readings:

June 2022, Volume 20, No. 6. "Planting in the Third World" by Kathleen Manolescu.
March 2021, Volume 19, No. 3. "Soil: The beginning" by Hastiin Beeshłigai.
March 2021, Volume 19, No. 3. "Breathing inside the body of Mother Earth" by Kathleen Manolescu.
May 2021, Volume 19, No. 5. "Diné farming & the Canyon de Chelly National Monument" by Ravis Henry.
May 2021, Volume 19, No. 5. "Planting is a part of our Diné way of life" by Delta Higdon.
May 2021, Volume 19, No. 5. "Growing up with planting" by Chantz Samuel.
June 2021, Volume 19, No. 6. "Plants in Hócho'íj" by Eric Willie.
June 2021, Volume 19, No. 6. "Plants in the Beginning" by Anderson Hoskie.
June 2021, Volume 19, No. 6. "Growing plants with manure" by George K. Sterner
July 2021, Volume 19, No. 7. "Tł'ézhii" by Kathleen Manolescu.
July 2021, Volume 19, No. 7. "Monitoring plant growth in your grazing area" by Gene Shepherd.

November 2019, Volume 17, No. 11. "Some plants in my father's grazing area" by Nixon Martinez.
September 2018, Volume 16, No. 9. "Collecting Indian Ricegrass, Tł'oh Déełí" by Kathleen Manolescu and Anderson Hoskie.
May 2017, Volume 15, No. 5. "Diné land use: Respect – the key word for success" by Nelson Roanhorse.
June 2017, Volume 15, No. 6. "Plants in Life" by Anderson Hoskie.
October 2017, Volume 15, No. 10. "Corn represents the journey of life" by Galen Ben.
September 2016, Volume 14, No. 9. "Enjoying fall fruits" by Harry Goldtooth.
May 2015, Volume 13, No. 5. "Collecting wild edibles" by Bertha Etcitty and Nora Nolan.
August 2015, Volume 13, No. 8. "The first yucca" by John E. Salabye, Jr. and Kathleen Manolescu.
August 2015, Volume 13, No. 8. "Yucca in Diné culture" by Harry Goldtooth.
August 2015, Volume 13, No. 8. "Making yucca fruit rolls" by Sadie Lister.
August 2014, Volume 12, No. 8. "Following my grandparents' footsteps" by Vince James.
May 2013, Volume 11, No. 5. "Hopi dry land corn farming" by Kathleen Manolescu.
May 2013, Volume 11, No. 5. "Heritage seeds" by Kathleen Manolescu.
June 2013, Volume 11, No. 6. "A tradition of growing corn" by Faye Gorman.
June 2013, Volume 11, No. 6. "Corn & the ceremonies" by John E. Salabye, Jr. and Kathleen Manolescu.
November 2011, Volume 9, No. 11. "Our traditional tools: our cultural standards" by With Deed.
August 2008, Volume 6, No. 8. "Waa' " by Lucy Becenti. (Waa' is wild spinach).
October 2006, Volume 4, No. 10. "Care of the Mountain Soil Bundle" by Ryan R. Hosteen.
October 2005, Volume 3, No. 10. "Harvest time: a special feeling" by John E. Salabye Jr. & Kathleen Manolescu.
October 2005, Volume 3, No. 10. "Taking care of the land" by Kathleen Manolescu.

Student Assessment Plan

The assessment plan will be to have students complete a Project Based Learning Project of 2-3 students per Power Point presentation.

Project Based Learning Project (PBL)

Theme for this Project: "Being in a hózhó mindset about plants and trees"

Content: Students will be able to explain at least 5 unique details about a plant or tree that grows in Kayenta and in their own home area. To share these details into their Power Point presentation.

Project Objective: Students will be able to create a Power Point that demonstrates the 5 unique details of the plant or tree in its habitat.

Materials: Navajo Nation Range Management Handbook by Frank Parrill, Nanise: A Navajo Herbal by Vernon O. Mayes and Barbara Bayless Lacy, Leading The Way magazine, 2-3

persons per PBL Project, paper, pencil, laptop, photos of the plant or tree, and additional resources from the library or family members.

Grades will be based on a PBL Rubric and a Self-Assessment Summary. A rubric will be given to the students prior to starting their Power Point Project to assist them in the organization of their project. While a verbal Self-Assessment will help the teacher to listen to the group’s progress on their project and to share suggestions, ideas, or improvements to the group’s presentation.

Areas to focus on for the details are: The Navajo name of the plant or tree, the Scientific name of the plant or tree, the Description and Distribution [the way in which something is shared out among a group or spread over an area]. (“Merriam-Webster”), Navajo uses (food, medicinal, ceremonial, location, etc.), Pictures or Illustrations of importance to show, Resources (with APA style citations) and Family Members as a personal resource. Include the Botanical Illustration and students will share information about their drawing that they thought was interesting to their plant or tree.

The Rubric

“A rubric is a guide that gives direction to the scoring of student products. It is especially helpful for assessing products such as open-ended questions, lab experiments, debates, oral presentations, visual representations, and written work.

In addition, rubrics encourage teachers to reflect on the validity and value of assignments not only before they are assigned but also after they are completed. This dual reflection time strengthens the assignment, the curriculum, and the assessment procedures, and aids in establishing a more rigorous curriculum.” (How to Assess Student Work, 1997, pp. 37).

As a teacher, I plan to provide a Rubric for my students to follow as they collect, explain, illustrate, and create their Project Based Learning project on “Being in a hózhó mindset about plants and trees”. Upon completion of their PBL project, the students will feel confident to share with their classmates their final presentation.

The following is the rubric chart that I will have students use for evaluating their presentation. The following is a rubric that will measure the completed presentation and the process (which is the cooperation part of the rubric chart which means students need to be involved in their group work and stay on task as a team player). This template is one that I have taken out of the soft covered booklet published by Prentice Hall for professional educators called *How to Assess Student Work*”

	Awesome	Admirable	Acceptable	Amateur
<i>Organization</i>	Well organized Transitions from idea to idea were excellent	Thoughtfully organized Transitions easy to follow	Somewhat organized Transitions not always smooth	Difficult to follow Transitions were abrupt and distracted audience
<i>Cooperation</i>	Worked extremely well with others	Worked very well with others	Attempted to work well with others	Little or no teamwork

<i>Content</i>	Excellent job of research Utilized information effectively	Good job of research Utilized information in an efficient manner	Acceptable job of research Limited information	Unacceptable job of research Little or not fact gathering
<i>Presentation</i>	Original, unique, and engaging	Well done and interesting	Few original touches and at times interesting	Predictable, bland

I firmly believe that by allowing students to create a unique presentation, it will show what they know, activating their prior knowledge, which is a part of an instructional strategy as an advanced organizer. Then, by having them make their own personal connections with the information they are collecting and including the information into their presentation, it will also increase their background knowledge on their selected topic on the plant or tree.

Diné Standards

9-12th Diné Culture Standards

Standard: I will develop an understanding of Dine way of life.

Concept 2 – Nahat’á: I will apply and practice the Diné way of life with confidence.

PO 3. I will practice respect of nature in my daily life.

9-12th Diné Character Building Standards

Standard: I will develop and apply critical thinking to establish relationships with the environment.

PO 2. I will coordinate a plan to show respect of the environment.

9-12th Diné History Standards

Standard: I will understand historical/factual events, people, and symbols that influence my family.

PO 4. I will research and analyze changes in cultural practices.

Arizona State Standards: World and Native Languages

Interpretive Listening (IL): Understand, interpret, and analyze what is heard on a variety of topics. The student can:

Novice, High: 1. Understand words, phrases and simple sentences related to everyday life; sometimes understand the main topic of what is heard.

Interpretive Reading (IR): Understand, interpret, and analyze what is read or viewed on a variety of topics. The student can:

Novice, Mid: 1. Recognize and understand some characters, words, and phrases.

Presentational Speaking (PS): Present information, concepts, and ideas to inform, explain, persuade, and narrate on a variety of topics using appropriate media and adopting to various audiences of listeners or viewers. The student can:

Novice, High: 1. Present basic information on familiar topics using learned phrases, and simple sentences.

Connections (CON): Build, reinforce, and expand knowledge of other content areas and evaluate information and diverse perspectives while using the target language to develop critical thinking and creative problem-solving. The student can:

Novice: 1. Identify and use familiar vocabulary and phrases in the target language supported by resources (e.g., maps, graphs, visuals, audio, digital media) to reinforce prior knowledge of familiar topics in other content areas (e.g., geography, history, arts, math, science).

Beyond Textbook Standards – 11th Grade

Reading Standards

11.R.RL.04: Determine the meaning(s) of words and phrases as they are used in a text, including figurative and connotative meanings, while analyzing the impact of specific choices on meaning and tone.

Writing Standards

11.W.05: The Highly Proficient student can produce clear and coherent writing in which the development, organization, and style are highly effective for the task, purpose, and audience.

Arizona English Language Proficiency Standards 2019

AZ ELP – Standard 7

By the end of each language proficiency level, an English learner can: conduct research and evaluate and communicate findings to answer questions or solve problems.

Basic: With moderate support, apply a developing set of strategies to:

B-1: gather information from multiple provided resources to answer questions.

B-2: summarize the main idea using evidence from text or presentations.

B-3: paraphrase observations, information notes with labeled illustrations, diagrams, or other graphics, as appropriate.

B-4: cite sources used in research appropriately.

Instructional Supports: Informational text types include but are not limited to: descriptions or accounts (e.g., scientific), explanations (e.g., causal factual), oral presentations, and so on.

Writing: 9-10.W.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively, assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

Speaking and Listening: 9-10.SL.4 Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task; use appropriate eye contact, adequate volume, and clear pronunciation.

Resources

Books

Benally, H. J. (1988). Dine philosophy of learning. *Journal of Dine Education*, 6(1), 1-8.

Benally, H. J. (1987). Dine bo'ohoo'aah bindii'a': Dine philosophy of learning. *Dine Be'iina: Journal of Dine Life*, 1(1), 16-18.

Diné culture and language curriculum framework. (1996). Window Rock, AZ: Office of Diné Culture, Language & Community Service.

Dine Culture-Based Curriculum. American Indian Institute/U of O Outreach & Office of Diné Culture, Language & Community Services.

Amá Sani dóó Achei baahane', Office of Diné Culture, Language & Community Services. Window Rock, Az.

Jackson, S., James, I. K., Attakai, M., Attakai, M. N., & Begay, E. F. (2005). *Amá Sani dóó Achei baahane'/The Office of Diné Culture, Language, and Community Services*. Window Rock, AZ: Office of Diné Culture, Language, and Community Services.

Diné Bizaad dóó Bibee'ó'ool' ijł Bóhoo'aah: Diné Language and Culture Curriculum. (2012). Kayenta Unified School District No. 27 and Cultural Center Navajo Language and Culture Curriculum Team. Kayenta, Az.

Lim, L. (1997). *How to Assess Student Work*. Upper Saddle River, NJ.: Prentice Hall.

Lueppe, S. & Etcitty, B. (November 2018). Female and male squash blossoms. *Leading the Way magazine*, 16(11).

Mayes, V. and Lacy, B. (1989). *Nanise': A Navajo Herbal*. Navajo Community College Press.

Parsons-Yazzie, E., Speas, M., Ruffenach, J., & Yazzie, B. (2007). *Diné Bizaad Bínáhoó'áah, Rediscovering the Navajo Language: An introduction to the Navajo language*. Flagstaff, Az.: Salina Bookshelf.

Online Media

Kayenta Unified School District. Home. (n.d.), Retrieved June 22, 2022, from <https://www.kayenta.k12.az.us/>

NavajoRange.nmsu.edu. (2017). *Selected Plants of Navajo Rangeland*. [file:///C:/Users/csinger/Desktop/Plants%20&%20Trees%20Curr/Selected-plants-of-Navajo-rangelands%20\(1\).pdf](file:///C:/Users/csinger/Desktop/Plants%20&%20Trees%20Curr/Selected-plants-of-Navajo-rangelands%20(1).pdf)

About. Teach Thought. (2022, May 8). Retrieved June 27, 2022, from <https://www.teachthought.com/about/>

2022 world population by country. 2022 World Population by Country. (n.d.). Retrieved June 23, 2022, from <https://worldpopulationreview.com/>

IVF Summary using a *Leading the Way* magazine article from the November 2018, Volume 16. No 11. issue of the “Female and male squash blossoms” by Sylvia Leuppe and Bertha Etcitty.