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Engaging School and Family in Navajo Gardening for Health: Development of the Yéego Intervention to Promote Healthy Eating among Navajo Children

India J. Ornelas, PhD, MPH,

University of Washington, Seattle, WA, United States.

Kassia Rudd, MEd,

Fred Hutchinson Cancer Research Center, Seattle, WA, United States.

Sonia Bishop, BS,

Fred Hutchinson Cancer Research Center, Seattle, WA, United States.

Desiree Deschenie, BS,

New Mexico State University Agricultural Science Center, Farmington, NM, United States.

Emily Brown, MPH,

Fred Hutchinson Cancer Research Center, Seattle, WA, United States.

Kevin Lombard, PhD,

New Mexico State University Agricultural Science Center, Farmington, NM, United States.

Shirley A.A. Beresford, PhD

University of Washington, Seattle, WA, United States.

Abstract

Objective: Navajo children are at increased risk for obesity, in part due to limited access to healthy foods. School garden interventions have been shown to increase access to fresh fruit and vegetables and consumption of healthy foods. Our study describes the development and pilot testing of a school garden intervention for Navajo elementary school children.

Methods: We reviewed existing school garden interventions and conducted formative research with students, caregivers, and school staff to inform the intervention. The intervention consisted of a garden built at the school and a yearlong curriculum on gardening and healthy eating. We pilot tested the intervention in an elementary school on the Navajo Nation.

Results: Formative research revealed the importance of incorporating Diné culture, including traditional growing practices and the preparation of traditional foods into the curriculum. School staff also stressed the value of tying the curriculum to state and Diné educational standards. Students enjoyed opportunities for hands-on activities and snack preparation.

Correspondence Dr. Ornelas; iornelas@uw.edu.

HUMAN SUBJECTS APPROVAL STATEMENT

All study procedures were approved by both the Fred Hutch and Navajo Nation Institutional Review Boards.

CONFLICT OF INTEREST DISCLOSURE STATEMENT

All authors of this article declare they have no conflicts of interest

Conclusions: Schools have a meaningful role to play in addressing childhood obesity disparities among Navajo children. School-based interventions that draw on cultural strengths and include healthy traditional practices can be a promising strategy for increasing fruit and vegetable consumption.

Keywords

nutrition; gardening; school health; child health; Native Americans

American Indian communities face a higher burden of childhood obesity than other racial/ethnic group groups.¹ Recent studies have documented particularly high obesity rates among American Indian children living in the Southwest, with one study indicating 47% of children were overweight and 28% were obese in the region that includes the Navajo Nation.² Previous studies have also found that children living on the Navajo Nation had higher rates of overweight and obesity compared to other racial/ethnic groups.³⁻⁵ Childhood obesity is a risk factor for developing type 2 diabetes and other chronic health conditions, and indeed, recent studies have shown that rates of diabetes are also high among American Indian children.⁶

Previous research in adults has concluded that there is an inverse relationship between whole fruit and vegetable intake and weight suggesting that one way to reduce obesity risk is by increasing fruit and vegetable consumption.⁷ Fruits and vegetables are low in calories yet high in nutrients making them healthy food choices. New Dietary Guidelines for Americans also focus on the importance of a healthy dietary pattern that includes vegetables and fruit, as well as grains, dairy, protein and oils.⁸ There is moderate evidence that such dietary patterns are associated with healthy body weight and lower risk of obesity.⁹

Recent studies indicate that fruit and vegetable consumption are low among members of the Navajo Nation, with more than half of Navajo adults consuming less than two servings of fruits and vegetables combined.¹⁰ For Navajo Nation residents, one factor that contributes to low fruit and vegetable consumption is the limited availability of fresh fruit and vegetables.¹¹ The colonization of American Indians in the U.S. has led to the destruction of traditional food systems, and as a result, almost the entire Navajo Nation is characterized as a food desert.^{12, 13} This has been compounded by the loss of traditional growing and farming techniques. Many Navajo rely on food sources with limited healthy options.¹⁴ The high cost of fresh fruits and vegetables (even when available) also contributes to low levels of consumption.¹¹ The lack of access to fresh fruits and vegetables has contributed to poor diet quality among Navajo.¹⁵ Therefore, improving access to healthy foods within the Navajo Nation and decolonizing the food system is crucial to reversing this trend.

Considering these barriers, interventions to increase fruit and vegetable consumption as part of a healthy eating pattern among Navajo children and their families are needed. School garden and complementary nutrition education interventions have been developed across the United States to try to address issues of poor availability and low consumption and to establish healthy eating patterns early in life that will be sustained across the life course. Several studies have shown that school garden interventions are effective in improving healthy eating among children and their families.¹⁶⁻²⁰ Childhood obesity disparities among

racial/ethnic minority children and children in rural areas have highlighted the need for programs that specifically address these populations.^{21–23} One such intervention is LA Sprouts, a 12-week curriculum consisting of cooking and nutrition education lessons aimed at increasing fruit and vegetable intake among urban Latino elementary school children.²⁴ Results from this study indicated significant changes in dietary and health outcomes among participants compared to control group members, including increased dietary fiber intake and fewer overweight children.²⁵ The CHANGE study, a school-based intervention to prevent unhealthy weight gain among rural children, also found that students in intervention schools had higher levels of vegetable consumption compared to those in the control schools.²⁶ Both of these studies point to the potential of using school gardens as a means to increase consumption of healthy foods for Navajo children living in rural areas. An even broader literature points to the potential of nutrition education interventions ability to improve healthy eating intentions and behaviors among elementary school children.^{23, 27–29}

The goal of this study was to demonstrate the feasibility of a school-based gardening intervention to increase fruit and vegetable intake among Navajo children. The intervention consisted of an on-site school garden used as a teaching space, and an elementary school curriculum that promoted gardening and healthy eating among students and their families. By pairing nutrition and gardening education with a school-based garden, the study team sought a combination the most effective strategies to address healthy eating among schoolchildren. Furthermore, the intervention sought to incorporate cultural factors by integrating Navajo traditions into nutrition and gardening lessons. This paper describes the approach to developing the curriculum as well as the lessons learned from an initial pilot study to assess feasibility of delivering the intervention in a Navajo elementary school.

METHODS

Identifying Existing Evidence-Based School Based Gardening Curricula

In developing the Yéego gardening and nutrition intervention, the study team drew on existing school-based garden programs and curricula. These included LA Sprouts, a curriculum comprised of two 12-week units on gardening and nutrition that was designed to be culturally and age appropriate for urban-dwelling Latino elementary school students and their parents.²⁴ The nutrition component targeted obesity prevention through a series of hands-on lessons that address carbohydrate quality, the importance of reducing intake of added sugars, and increasing intake of dietary fiber. The garden component taught skills necessary to plant and maintain edible plants and incorporated ecological concepts that encourage stewardship of the environment and natural resources. Lessons are sequential, following the growing season, and were designed to equip students with the knowledge and skills necessary to garden on their own. The curriculum developers also drew on the theoretical construct of self-efficacy, which asserts that a person's belief in their ability to take an action increases the likelihood of them taking that action. The curriculum was evaluated in several studies), and was publicly available online at the time the Yéego curriculum was developed.^{18, 24, 30}

Members of our research team also participated in a training on school-based gardening offered by Life Lab.³¹ Life Lab is school garden education organization providing curricular

materials and a California School Garden Training Program. The training provided garden-enhanced nutrition education using designated garden space as an outdoor classroom. The onsite training provided the opportunity to see how an outdoor school garden functions and how to create activities for any subject in the curriculum using the garden as a tool in the education process. Many of the Life Lab suggestions were incorporated in to the pilot school garden. For example, the use of bilingual signage, making the garden highly visible for parents, teachers and children and adding benches and tables for outdoor classroom instruction.

Formative Research with Elementary School Students, Caregivers and Staff

While the LA Sprouts curriculum served as the foundation for the Yéego curriculum, substantial changes were made to the content and structure based on formative research with our Navajo community partners. In 2016, our research team approached a small charter school in Shiprock, NM about conducting a pilot feasibility study to test the Yéego intervention. The school was located next to the Shiprock community Chapter House and served elementary students in kindergarten through 5th grade. At the time, it had one of the smallest average classroom sizes in the community, with fewer than ten students in each grade level. The school offered a strong emphasis on the Navajo language, which attracted families who wanted their children to be able to understand and speak the language.

School administration and staff were familiar with the NMSU Agricultural Science Center's previous gardening projects and were interested in collaborating on a school-garden project. As a relatively new school that was still in the early stages of establishing their own curriculum, they saw the study as an opportunity to provide culturally relevant gardening and nutrition education to their students. In addition, through previous gardening projects in various Navajo communities, the study team had garnered the support of key influential community members and organizations.

One focus group was conducted with adult caregivers of the school's students (N = 13). Caregivers were asked about what they would like their child to learn at school regarding gardening and nutrition as well as their own behaviors related to healthy eating and gardening. The discussion lasted about 90 minutes and was moderated by a study team member using a discussion guide. Participants were provided a light dinner and child care, if needed. Study team members took notes during the focus group, which was also audio recorded. The recording was transcribed, and both the transcription and notes were reviewed by multiple study team members to identify key themes.

Two focus groups were conducted with the charter school students during the school day. One group included students in kindergarten and first grade (N = 7), and the second was for students in the second and third grades (N = 8). Students were divided into groups of three to five students for an interactive small group discussion moderated by a study team member. The guide for this discussion included questions related to what students already knew about healthy eating and gardening, what else they would like to learn about healthy eating and gardening, what they would like to plant in their garden, and which foods they most commonly ate. Discussions lasted about 45 minutes. An adult caregiver provided consent for all students that participated. Again, study team members took detailed notes during

the sessions, which were also audio recorded. After the sessions, the audio recordings were reviewed to add further details to the notes. The written notes were also read by multiple study team members to identify key themes.

Study team members also conducted individual meetings with the school principal, school teachers at each grade level, school staff, and the Navajo language expert to discuss aspects of the program, including both the school garden and curriculum. During these meetings study team members reviewed the proposed curriculum topics and related activities (Table 1). When school staff weren't available for individual meetings, their input was sought via email. Notes from these meetings and correspondence were reviewed by study team members to identify key themes.

Pilot Test of the Curriculum

The school garden and curriculum was pilot tested to assess the feasibility of delivering the intervention. The garden was prepared in the summer preceding the school year. The garden consisted of four raised garden beds which were 24 square feet each and filled with imported soil. A water harvesting drip system which utilizes building rain gutters was installed. A greenhouse and storage shed were constructed on site. Most garden preparation and maintenance was done by intervention staff, although school staff members were also trained to do garden maintenance. A combination of cool and warm season crops were planted and cultivated throughout the year, including corn, squashes, beans, and tomatoes in line with students' preferences. Intervention staff monitored the garden yield in order to assess how much the space could produce. The fruits and vegetables harvested were used to prepare meals and snacks for students. Teachers were encouraged to use the garden as a teaching space.

Curriculum lessons were taught throughout the year from September 2016 – May 2017, with an average of two lessons being delivered per month. Lessons lasted about 60 minutes to deliver and were offered to the two multi-grade classrooms separately by two trained intervention staff with backgrounds in health, education and gardening. School staff, including teachers, often assisted with the lessons. Intervention delivery was monitored with a "curriculum summary sheet" that the staff member completed after the lesson. On this sheet, staff noted when the lesson was conducted, number of students in attendance, the number of staff involved, supplies needed, a summary of what was done, anything unexpected that happened and student engagement. Summary sheets and implementation issues were also discussed by the full research team at weekly team meetings. After implementation of the entire curriculum, staff reviewed the lessons and summary sheets to summarize lessons learned, including aspects of the curriculum that worked well and suggested modifications for future delivery.

RESULTS

Formative Research with Elementary School Students, Caregivers and Staff

Key themes from the focus group with adult caregivers are summarized in Table 2. There were four main topics discussed: the content they wanted their children to learn,

the skills they wanted to be taught, what they considered to be essential components of the curriculum, and the potential impact of the program beyond the classroom. Topics they wanted their children to learn through the program included Navajo concepts of ecology, ceremonial use of plants, and food system literacy. Caregivers also recommended that students be taught how to make healthy dietary choices, kitchen safety and cooking skills, and sustainable gardening practices such as water conservation and food and seed preservation. They considered Navajo culture to be an essential piece of the curriculum, including how to grow and prepare traditional foods. Caregivers also hoped that student participation in the program would extend beyond the school to positively impact cooking, eating and gardening behaviors at home. As a result of caregiver feedback, the curriculum was modified to include the preparation of culturally significant dishes such as Kneel Down Bread and Blue Mush. Storytelling was identified as an important way of conveying content; thus, several children's books featuring Navajo stories were added to the curriculum.

Student focus groups echoed the preference for using storytelling as a teaching tool, and emphasized an interest in learning through observation and interaction. In particular, students expressed excitement over the idea of viewing the entire life of a plant from seed to harvest, and learning how to take care of plants. Students also communicated an interest in learning through drawing.

Teachers requested that the curriculum support the literacy and math learning outcomes outlined in state and Diné educational standards, with particular attention paid to basic math skills such as addition, subtraction, and measurement. They also suggested reordering some of the lessons to better reflect the arc of the school curriculum. In reviewing the focus on making healthy eating choices in the curriculum, school staff noted that their own school cafeteria offered very few choices for children. The curriculum was updated to address healthy decision making when presented with limited options. Additionally, school staff that had more experience with gardening practices requested that companion planting, the traditional practice of planting corn, squash and beans together, be included in the gardening lessons.

Curriculum Development

While some of the core content from the original LA Sprouts curriculum was retained, lessons with common themes and learning outcomes were combined to make more space for content and cultural aspects requested by Navajo students, caregivers, and school staff. In addition, many content examples, activities, and recommended snacks were changed to reflect Diné cultural traditions. Lessons also incorporated traditional Navajo knowledge and cultural practices, including inviting a guest speaker, such as an elder from the community, to discuss traditional foods and growing practices. In addition, relevant children's books were included to address the desire for learning through storytelling to meet common core literacy standards. Several of the books included were explicitly requested by community partners or focus group participants.

Several other modifications were made to lessons in the LA Sprouts curriculum. Learning targets were rewritten to better reflect the outcomes requested by the target community. They were also edited so that they could be more easily assessed. The guiding questions outlined

at the beginning of each lesson were edited to elicit student ideas so that the teacher could better highlight and incorporate relevant student knowledge and tailor the lesson to address any identified gaps in understanding. Students were encouraged to use content taught in each lesson to make choices in both the garden and in their own homes, generating their own meaning for terms and practices when relevant. We integrated a student journal into the lessons that could be sent home with students after the culminating harvest and used as an ongoing content reference. All lessons were edited to follow the same format:

1. Introduction: This section asked students to think back to what they had learned during the previous session, and then introduced students to the day's activity.
2. Activity: This included new content and a hands-on activity.
3. Garden work (for Gardening Lessons) or Snack Preparation (for Healthy Eating lessons): This component was generally directed by the instructor but executed by the students.
4. Closing: This section asked students to think back on what they had learned during the session and record it in their journal.

As a result of these changes, students' voice and priorities became a central part of the Yéego curriculum. This format was designed to make it easier for those delivering the lessons to adapt as needed to meet the varied needs of specific students. This was an essential change, as the Yéego study included a wider age-range than LA Sprouts. Additionally, the flexibility inherent to a student-centered curriculum required that examples be pulled from students' daily lives and personal cultural traditions, increasing the cultural relevance of the lessons. In addition to leveraging the many strengths of the LA Sprouts curriculum, the content covered by the Yéego curriculum was influenced by Office of Diné Education school standards, Columbia Teachers College Food Day Curriculum, Next Generation Science Standards, New Mexico and Arizona Common Core Standards. Research team expertise in epidemiology, community health, nutrition, and science curriculum development were combined with iterative community feedback to create a curriculum that empowered students to make healthy choices by introducing nutrition and gardening content that referenced and built upon the resources and traditions already present within the community.

Lessons Learned from Piloting the Curriculum

Based on our review of the curriculum and summary sheets, the study team identified aspects of the curriculum that facilitated implementation overall, as well as specific changes that should be made to individual lessons. Intervention staff reported that interactive parts of the curriculum that were particularly well received, including group discussion, snack preparation, and learning through games. Some lessons were seen as being too advanced for those in the classroom with students in kindergarten and first grade. Intervention staff also noted that the lessons needed to account for variations in family structure, such as children being raised by grandparents or other family members, and levels of food insecurity in the community, such as children skipping meals or families not being able to afford certain foods. Another recommendation was that lessons should be better aligned with the seasons

and what is growing in the garden at the time. Some school staff also felt that lessons could incorporate more content on vocabulary and writing practice.

Several additional revisions were made to the curriculum based on the pilot. These included changing the curriculum to focus on third and fourth graders, instead of young elementary school students. Specific revisions that were made to the curriculum content based on feedback from the staff delivering the lessons, such as removing duplicative content and revising activities. The number of lessons was decreased overall and re-ordered to better align with gardening seasons. As part of our revision process, the curriculum and pilot results were shared with a local expert on teaching in Navajo elementary schools. They suggested two additional changes to the structure of the lessons, including adding an “exit ticket” to assess students’ retention at the end of each lesson. This most often involved a drawing or journaling activity related to the lesson content. They also recommended mapping the lessons on to specific state and Diné standards, to assist teachers with incorporating the curriculum into their existing lesson plans. Tables 3 and 4 present the final version of the curriculum after revisions were made, including the corresponding New Mexico, Arizona, and Diné standards.

DISCUSSION

Several interventions have been developed to address racial/ethnic disparities in childhood obesity. However, few have been developed specifically for American Indian children and therefore may not be appropriate for the unique cultural and environmental context of the Navajo Nation. This study builds on previous research by highlighting how evidence-based interventions can be adapted in order to meet the needs of Navajo youth, including the process of pilot testing the curriculum and using the findings to further refine the intervention. There has been an increased focus on interventions that can modify both individual behaviors and address environmental barriers to healthy eating. The study findings point to school-based gardens as a promising strategy for addressing both individual and environmental determinants of childhood obesity disparities.

A key part the adaptation process was soliciting input from key community stakeholders. Several themes of our formative research were consistent with other qualitative studies exploring factors related to childhood obesity among American Indian children. Our study highlighted that the Navajo community members involved in the study wanted nutrition education programs to teach their youth about food systems, the connection of food systems to Diné culture, and the importance of healthy eating for the entire family. Formative research used to develop and evaluate Feast for the Future, a similar program to increase access to healthy foods for American Indian youth in the Southwest, also noted the connection between traditional foods and health, interventions that draw on cultural strengths, and the importance of encouraging behavior change in the entire family.^{16, 17} Similar to our study, qualitative interviews with community leaders also noted the importance of revitalizing traditional food systems through gardening and the connection of gardening and farming to culture.¹⁶ Studies in other indigenous communities have noted the importance of similar concepts, such as social relationships and food sovereignty.²⁰

The Yéego Healthy Eating and Gardening intervention tried to explicitly address these community and family values identified in formative research by embedding them into aspects of both the school gardens and the curriculum. For example, the curriculum taught students how to prepare traditional foods and use traditional growing practices. Other nutrition education interventions aimed at addressing disparities have noted the need to incorporate a strengths-based approach building on aspects of indigenous culture that encourage healthy behaviors.^{21, 32} This is especially important in communities where a history of colonization and oppression have disconnected communities of their language, healthy traditions and relationship to the land.

Both the formative research and pilot testing were also critical to refining the curriculum to better address the needs of school teachers. Feedback from school staff and educational leaders in the community noted the need to tie the lessons to learning objectives, as well as national and state standards, and to use culturally relevant and interactive pedagogical approaches to hold students' attention. The curriculum benefitted from this helpful feedback, which may ultimately lead to a more sustainable intervention that aligns with school and teacher priorities. Previous research on school-based health promotion interventions have noted the importance of incorporating teacher feedback into the intervention design, as well as the importance of tying nutrition education to other academic standards.^{33, 34}

There were some limitations to the study. While the work built on gardening and healthy research in several communities on the Navajo Nation, this study only included formative research from one small school. Therefore, the results may not be generalizable to other Navajo schools and communities. In addition, only the research team, including intervention staff evaluated the fidelity and feasibility of the intervention. Having independent observers assess the lesson delivery might have resulted in a more objective evaluation of the curriculum.

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IMPLICATIONS FOR HEALTH BEHAVIOR

The findings suggest that elementary schools may have an important role to play in addressing obesity disparities among Navajo children. This is consistent with Healthy People 2030 objectives related to nutrition and healthy eating (NWS-06, -07, -08), school policies and programs that promote health (EH-D01), and educational achievement (AH-05, -06).³⁵ The development of the Yéego intervention provides a model for how evidence-based school garden interventions can be adapted to other unique contexts and populations. Soliciting input from caregivers, students, community leaders and school staff was critical to further refining the intervention. Establishing these relationships can also set the stage for future research and evaluation of health promotion interventions. The findings can also benefit agricultural extension agents and other organizations working with schools and youth to improve healthy eating. Further research is needed to assess the impact of the Yéego intervention on gardening and healthy eating outcomes, as well as whether the intervention is feasible and appropriate for other Navajo communities. Navajo educational institutions have already indicated an interest in evidence-based curricula that could be more broadly disseminated.

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Table 1.

Initial List of Curriculum Topics Proposed

	Garden Lesson	Healthy Eating Lesson
1	Introduction/Planting a garden	Introduction/Kitchen Safety
2	Sowing and Transplanting	Food Sovereignty & Reading a Recipe
3	Garden Maintenance	Whole Foods and Nutrition
4	Water	Empty Calories
5	Compost	Fruits and Vegetables
6	Plant Parts & Life Cycle	Fiber
7	Traditional Agricultural Practices	Traditional Foods
8	Practices Pollination	Food and Family
9	Seasonal Crops	Garden to Table
10	Native Plants & Navajo Ecology	Breakfast and Lunch
11	Food Preservation & Seed saving	Celebrations & Gatherings
12	Harvest	Garden Celebration

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Table 2.

Themes and Example Quotes from Caregiver Focus Groups

Discussion Topic	Themes	Quotes
Knowledge to be gained	Ceremonial and traditional views of ecology and food system	“All the plants, they’re all nature. So, and they got to need to know about why it’s there and how you can use it – utilize it in our culture.”
Skills to be taught	Healthy dietary choices, cooking, and sustainable food practices	“So, like hopefully the whole process of going through it with how to water it, plan it, just the process that hopefully she’ll appreciate vegetables.”
Essential components	Incorporate Navajo knowledge and culture (growing and preparing traditional foods)	“Maybe some of the stories that tie in specifically to the corn and then also looking at the history of where – the actual history of where corn came from...”
Impact beyond school lessons	Student learning should positively impact home food practices	“She’s more into making healthy choices in the things that she eats. And so we try to always make sure that we have a lot of fresh vegetables and fruits available. She doesn’t – she also is very cognizant of limiting meat.”

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Table 3.

Yéego Healthy Eating Curriculum

Lesson	Topic and Learning Objectives	Standards	Activity/Snack
1	<p>Introduction & Cooking Safety</p> <ol style="list-style-type: none"> 1 Provide personal definitions of individual and community health, explain their significance, and describe what actions they already take to feel healthy. 2 List the behavior expectations for nutrition class, including proper kitchen safety practices. 3 Describe the purpose of gaining positive attitudes and positive behaviors towards fruit and vegetables. 	<p>AZ: HS1 C1 PO1 NM: CS1 B1; CS6 B1 B3 B4 DINÉ: 3DCS1 C1 PO1</p>	<p>Knife safety Snack: fresh fruits & veggies</p>
2	<p>Reading a Recipe</p> <ol style="list-style-type: none"> 1 Read a recipe and understand its sequence and parts 2 Use a recipe to create a snack. 	<p>AZ: HS1 C3 PO2 NM: CS4 B1 B4 DINÉ: 3DOLS1 C2 PO4</p>	<p>Recipe flip book Snack: Apple donuts</p>
3	<p>Whole Foods and Nutrition</p> <ol style="list-style-type: none"> 1 Distinguish between whole foods and heavily processed foods 2 Read and understand a nutrition label 3 Prepare a snack using processed/whole frozen fruits and vegetables. 	<p>AZ: HS1 C3 PO2 NM: CS3 B4; CS2 B1 DINÉ: 4DCHS1 C2 PO4</p>	<p>Reading nutrition labels Snack: Smoothie</p>
4	<p>Eating for Energy</p> <ol style="list-style-type: none"> 1 Describe and calculate energy in and energy out. 2 Use My Native Plate to describe a balanced meal. 3 Define food groups and what they include. 4 Assess their personal dietary choices and reflect on ways they can include more nutritional variety. 	<p>AZ: HS1 C3 PO2 NM: CS3 B4 DINÉ: 3DGS1 C2 PO3</p>	<p>My Native Plate Snack: Agua Fresca</p>
5	<p>Fruits and Vegetables</p> <ol style="list-style-type: none"> 1 Understand the importance of “eating a rainbow” (2 – 3 servings of a variety of fruits and vegetables). 2 Demonstrate that color can indicate different nutrients available in fruits and vegetables. 	<p>AZ: HS1 C3 PO2 NM: CS3 B1 DINÉ: 4DCS1 C3 PO4</p>	<p>Eat the Rainbow! Snack: Fresh fruits & veggies</p>
6	<p>Traditional Foods & Food Sovereignty</p> <ol style="list-style-type: none"> 1 Explain how food access and availability affect personal and community health. 2 Describe how the Navajo Nation works towards food sovereignty. 3 Prepare a traditional dish. 	<p>AZ: HS C3 PO2 NM: CS4 B1 B4 DINÉ: 4DGS1 C2 PO3</p>	<p>Guest speaker Snack: Traditional dish</p>
7	<p>Food and Family</p> <ol style="list-style-type: none"> 1 State three benefits of family meals. 2 Appreciate that families have different meaningful traditions and structures. 3 Double a recipe. 	<p>AZ: HS1 C1 PO1 NM: CS4 B1 B4 DINÉ: 4DGS1 C2 PO3</p>	<p>Interviews about family traditions Snack: Chips and fresh salsa</p>

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Lesson	Topic and Learning Objectives	Standards	Activity/Snack
8	<p>Garden to Table</p> <ol style="list-style-type: none"> 1 Identify the sources of the food they eat. 2 Investigate their local food system and how gets from the farm/garden to their plate. 	<p>AZ: HS1 C1 PO1 NM: CS7 B3 B2 DINÉ: 4DGS1 C2 PO3</p>	<p>Vegetable fact wheel Snack: Samples featured in <i>Who Grew My Soup?</i></p>
9	<p>Breakfast and Lunch</p> <ol style="list-style-type: none"> 1 Explain the importance of eating a healthy breakfast and lunch. 2 List strategies for making healthy food choices at school. 3 How to make a healthy meal for eating on the go. 	<p>AZ: HS1 C1 PO1 NM: CS3 B4 DINÉ: 4DGS1 C2 PO3</p>	<p>Fruit & vegetable scattergories Snack: Rainbow garden wrap</p>
10	<p>Celebrations and Gatherings</p> <ol style="list-style-type: none"> 1 Explain strategies for creating healthier meals for celebrations and gatherings. 2 Redefine personal and community health using information that they have gained through the course of this unit. 	<p>AZ: HS1 C2 PO1 NM: CS7 B1 B3 DINÉ: 3DGS C4 PO1</p>	<p>Celebration Snack: Traditional dishes</p>

Table 4.

Yéego Gardening Curriculum

Lesson	Topic and Learning Objectives	Standards	Activity
1	<p>Introduction to the Garden</p> <ol style="list-style-type: none"> 1 Understand expectations for behavior in the garden 2 Identify the different parts and plants in the garden. 	<p>AZ: HS1 C3 PO1 NM: 3LS3 C2 DINÉ: 3DCS1 C2 PO2</p>	Garden scavenger hunt
2	<p>Maintaining a Garden</p> <ol style="list-style-type: none"> 1 Perform basic garden maintenance tasks such as weeding, watering, and thinning. 2 Identify and describe 3 common weeds. 3 Explain how nature helps take care of the garden (PLANT: Place, light, air, nutrients, thirst-quenching). 	<p>AZ: 3P4; U113 NM: 3LS3 C1; 4LS1 DINÉ: 3DCS1 C2 PO1</p>	Weeding and watering
3	<p>Food Preservation and Seed Saving</p> <ol style="list-style-type: none"> 1 Explain the process for saving seeds, and the practice's significance for sustainable farming. 2 Describe the plant life cycle and why vegetables are important for healthy eating. 	<p>AZ: 3L2; U16 NM: 3LS2 C1; 4ESS2 C1 DINÉ: 4DCS1 C3 PO3</p>	Quick pickles
4	<p>Soil and Compost</p> <ol style="list-style-type: none"> 1 Understand why compost is important for soil and plant health 2 Describe how soil health connects to human health 3 Identify the components of compost, and explain how to care for it 	<p>AZ: 3L1; U15 NM: 3LS1 C1; 4PS3 C2 DINÉ: 3DCHS1, C2 PO3</p>	Compost jar test
5	<p>Water in the Garden</p> <ol style="list-style-type: none"> 1 Describe the water cycle, and how humans can impact it 2 Explain how what we put in the ground eventually ends up in us 	<p>AZ: 3L1; U15 NM: 3ESS2 C1; 4ESS2 C1 DINÉ: DCS2 C2 PO 1; C4 PO 2; 3DCH, C4 PO2</p>	Stem experiment
6	<p>Plant Parts and Life Cycle</p> <ol style="list-style-type: none"> 1 Compare the life cycle of a flowering plant to the life cycle of another organism. 2 Learn the stages within the life of a plant. 3 Describe the concept of a life cycle 	<p>AZ: 3L1; U15 NM: 3LS1 C1; 4LS1 C2 DINÉ: 3DCHS1 C2 PO4</p>	Plant life cycle diagram
7	<p>Native Plants and Navajo Ecology</p> <ol style="list-style-type: none"> 1 Identify 3 plants that play an important role in Navajo culture. 2 Make a traditional craft using a plant native to New Mexico. 	<p>AZ: 3L2; U16 NM: 3LS3 C2 DINÉ: DCS C3 PO 3; 4DCS1 C3 PO4</p>	Guest speaker
8	<p>Pollination</p> <ol style="list-style-type: none"> 1 Describe the concept of pollination and how it works. 2 Name pollinators and explain their job in plant reproduction. 3 Identify parts of a flowering plant. 	<p>AZ: 3E1; U14 NM: 3LS1 C1; 4LS1 C2 DINÉ: 3DCS1 C2 PO1</p>	Pollinator game
9	<p>Getting Ready to Plant in the Garden</p>	<p>AZ: 3E1; U14 NM: 3LS1 C1; 4LS1 C2 DINÉ: 3DCS1 C2 PO1</p>	Newspaper planter

Lesson	Topic and Learning Objectives	Standards	Activity
	<ol style="list-style-type: none"> 1 State what seeds need in order to grow (PLANT: place, light, air, nutrients, thirst-quenching). 2 Grow seedlings for plants that can help with attracting pollinators for vegetable growth and attract beneficial insects. 		
10	<p>Traditional Growing Practices</p> <ol style="list-style-type: none"> 1 Describe traditional growing practices in New Mexico and the Navajo Nation. 2 Describe the benefits of traditional growing practices: using planting stick, waffle gardens, 3 sisters. 	<p>AZ: 3E1; U14 NM: 3LS4 C4 DINÉ: 4DCHS1 C2 PO4</p>	Three Sisters garden map