

Place Value

Planting A Garden Unit

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Diné Institute for Navajo Nation Educators (DINÉ)

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Author Note:

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Introduction:

During my 2nd grade afterschool tutoring session, I'll have about 4 Intensive Navajo students glaring at me with blank questioning looks. I ask softly, "What do you think we all have in common in Mathematics?" They answer promptly, "We need more help. We're dumb. We have low scores." It was disheartening to hear their comments of low self-esteem or not being as mathematically capable as classmates and know they struggle with grade level Mathematic curriculum.

I slowly lean over and whisper, "Once upon a time, I sat in the same place you did and felt as you are now. I use to think I was not smart and didn't know how to do the work. I felt dumb. I use to be quiet in class, hoping the teacher wouldn't call my name." With wide open eyes, my students gaze with amazement and ask, "How come you're a teacher now? I thought you were always smart. How did you get better?" After building a rapport with my students, I continue my childhood life journey about working harder, studying, yearning for knowledge, and asking questions, even if I thought it was dumb. They look at each other and nod their heads. I go on telling them I struggled with math at your age, in high school, college, and sometimes even now. Along the way, I learned some tricks and ask if they are ready to learn my math tricks. Smiling with a weary look, they excitedly say, "Yes, Ms. Yazzie, I want to learn your tricks!"

I take out my 10 spread fingers and say this my 1st tool that I always know I will have. Puzzled and looking at their own fingers with a smirk, begin to mimic after me counting each finger to 10. Starting with my right finger as numeral 1, and correcting students who use pointer finger. I tell them that's 1 of my tricks. We will all write our digits on our fingers, so it is a reminder of where we start with counting 1 to 10. After we have mastered counting forward, we master counting backwards from 10 to 1. Mental counting is very important for my 2nd grade students to know one more or one less strategy.

My 2nd tool is manipulatives. I explain that rods, blocks, beans, seeds, 10 frame, counters, graphic organizers, or snacks are used as a tool. Other tricks, I use are introduced before a lesson, so I can engage student's interest. At bus time, I remind students to share what they learned with family members, and I'll know who did or didn't at Parent Teacher Conference. Most of the parents say they learned a new way to solve a problem or how home objects can be calculated.

Making math meaningful and relevant to real life, makes the students explore and engage in applying mathematic skills in other situations. When I create real-life word problems or projects, parents enjoy the family time and seem more willing to engage with homework projects. By the end of 1st quarter, most projects are completed.

The Planting a Garden Unit starts in the classroom by teacher modeling, guiding, and building confidence for students to independently create a home garden with family. An extended activity for students is to build a raised bed or garden surrounded with a fence to plant some vegetables or melons, so it can encourage families to eat healthier, increase physical activity, and decrease obesity. I would like students to see number and operations, number sense, geometry, and measurements in building a garden and how it may apply during planting and harvesting.

Context

As a second grade teacher, my students will have access to whole/small group instruction for 120 minutes each day Monday thru Thursday. Every Friday is a weekly assessment day due to half a day schedule. Most days, students will have access to 4 student computers, 1 iPad, 1 promethean board, anchor charts, and a laptop to integrate technology. 120 minutes of Math instruction will focus on bell work consisting of adding or subtracting within 20 with or without seeds or manipulatives for about 15 minutes, 10 minutes of whole class instruction on vocabulary, 5-10 minutes of how to represent a number, 15 minutes on strategies for the lesson, 20 minutes to practice whole group or small group on the lesson of place value in 3 digit Place Value Chart, group presentation of group finding will take about 20 minutes overall, and 30 minutes of centers. Centers include Technology, Drafting a Plan, Computation, Number Sense, and Place Value Chart. However due to Covid-19 Pandemic, our school started in a Distance Learning format. Teachers and students are presenting instruction in a synchronous and asynchronous learning platform. We are using Schoology and present most lessons through Google Meets for 15-30 minutes on core instructions; reading, mathematics, writing, vocabulary and community building. Students have textbooks at home and teachers use a document camera or videos with screencastify. Then student also have independent time to complete workbooks, projects, or interactive lessons.

Assessment days are usually on Friday, which is a half day schedule, with a quick timed quiz and concept of the week test. Plan a Planting Garden Unit will be designed for a second grade classroom, which will integrate three Common Core Mathematic Standards and Diné Standards. This unit will take approximately 10 weeks with about 120 minutes mathematic instruction daily. Students will be adding or subtracting seeds, vegetables, melons, and weeds. Arrays will be used to plan a garden on a graph paper. Having hands on counting will help students' associate numbers to objects. Using Kinesthetic Learning, students will learn handing verbs with Navajo names of seeds, vegetables, and weeds. Hopefully, this will increase NWEA and core math program scores.

Why?

Planting vegetables and melons have always been a way of survival for Native Americans. Gardening has become a dying tradition due to the dominant society influences, such as fast food franchise, restaurants, grocery stores, and premade heat up food, along with this, brought obesity, diabetes, high blood pressures, and unhealthy food habits. If students can start learning how to plant and grown their own food, then it may increase physical activities, but more importantly, families can eat more homegrown healthy vegetables and melons. Navajos are affected by obesity and diabetes due to unhealthy behaviors. (India J. Ornelas, 2018) Yeego Gardening study found that those families gardening more than 4 times per month are eating about 1 more serving of Fruits and Vegetables per day than those gardening 4 or fewer times per month. Diabetes is the 4th leading cause of age adjusted deaths in Navajo Nation, which is causing 47.7 deaths per 100,000 people. Intervention to promote gardening has shown to increase fruit and vegetable intake, decreased obesity measured by body mass index, and reduces the hemoglobin A1c, a measure of blood sugar control, and risk of Diabetes complications, according to Ornelas study. The participants benefited in controlling their healthier eating choices and got daily exercise from being physically active. Other studies have found that traditional Diné (Navajo) teachings and practices state Diné people gain strength from the land and use the land as a teaching tool for survival. This study also found Navajo farmers felt like they were maintaining Navajo tradition

and upholding Navajo Culture through gardening teachings. (India J. Ornelas, 2018) Gardening would be a hands on activity make math more engaging, culturally relevant, and understand mathematic concepts in-depth.

Most students come from single, or low income households. Some students have no electricity or running water and often live with extended family members. Most families have little or no education beyond high school, therefore education is frowned upon. Low attendance or tardiness at beginning and middle of the month shows that education is not a priority, due to Social Security Checks, Retirement Checks, Disability Checks, WIC, and SNAP deposits leading to parents or grandparents heading to Flagstaff, Page, or other towns. Homework is rarely turned in due to no importance, no electricity or other home chores that have higher precedence. 100% of students receive free/reduced school lunch. 98% are English Language Learners and require a 2 hour bus ride to and from school. Parent involvement is limited. Parent Teacher conference, Family Nights, or Afterschool Academic events have low attendance; however sports will bring in spectators you rarely see in school. Students are in self-contained classrooms for 8 hours. Elective classes for Life Skill is by a counselor, however computer, P.E., and library are done by their home teacher. Schooling has changed from being in the building to teaching at home and students learning at home from a computer screen, tablet/ipad screen, or phone call/screens.

Online Schooling has been around for years, however it is 60% online education and 40% Xerox copies for our children. Learning Packets are also being create and distributed to parents on the bus delivery along with food trays for students. Our student live in rural areas with limited or no internet access. Some students do not have a phone, tablet, ipad, laptop, or desktop to utilize the online learning. Our school will distribute laptops and hotspots in October. Our school is then going to fully immerse students to Online Education. I will have to become creative on how I can virtually still integrate my Garden Unit hands on in a Distance Learning situation.

The Plant a Garden Unit will help students fluently add or subtract by counting up or down the seeds, plants, or veggie/melon individually, groups, or whole class. Students will create a Seed Chart at the beginning of the unit, later a Garden Plotting Chart, and a Harvest Chart. Students will understand 3 digit numbers by grouping seeds into hundred bags/sticks, tens bags/sticks, and ones bags to be placed into a Place Value Chart. Teacher will scaffold from using Base Ten Blocks to seeds to show hundreds, tens, and ones to represent a number, and then add or subtract 2/3 digit numbers. When students master representing a 3 digit standard number with seeds, will they be ready to work in groups to show addition or subtraction of 3 digit numbers from the Plant a Garden Classroom Chart. When students have practiced multiple ways of adding or subtracting numbers, will they create a one-step word problem, leading to paired groups to work on creating a two-step word problems.

Roger Howe, a research mathematician, proposes arithmetic instruction should develop understanding of the overall structure of the base ten place value system and develop comfort with large and small numbers. In understanding at a deeper level the nature of approximation and how it interacts with computation helps students compute with 1, 2, or 3 digit numbers deal with numbers of all magnitudes and understanding the world-both natural and social structures. Current educational practice is having students deal with 1 digit number, then two digit, and then three digit. The main components of base ten system are:

- (i) Learning the addition and subtraction facts to 10 very well and flexibly;

- (ii) Learning the teen numbers as a 10 and some more 1s;
- (iii) Learning higher addition and subtraction facts by making/unmaking a 10.

Early instruction in addition needs to emphasize:

- (i) That two digit numbers are made of tens and ones in place value
- (ii) When you add two two-digit numbers, convert into next place value. (Howe, 2018)

Roger Howe's research justifies that in the Unit of Plant a Garden needs to first lay down the foundational skills need to be mastered and understood. Integrating garden aspects into building place value skills allows students to get hands on experience with seeing ones, tens, and hundreds with seeds. Understanding ones can be turned into tens and then tens into hundreds will help with addition and subtraction. When it comes to composing and decomposing numbers will be better understood if students visualize it. Using seeds instead of place value blocks and more hands on materials will help create a more culturally relevant manipulative.

Students exposed to culturally relevant materials will increase engagement, higher order thinking strategies, and increase Navajo language awareness. Most students come from home environments where Navajo- English is spoken. It is a blend of 1 or 2 Navajo words mixed with English or mainly English but with Navajo accent, therefore students come in with limited academic vocabulary and proper English. With lack of exposure to Math vocabulary words, it is important to introduce Math terminology before lessons on Anchor Charts. Students will integrate the Navajo Language by stating numbers and vegetables/ melons in Navajo along with exploring the importance and history of gardening in the Native Culture.

Navajo students will create a plan to Plant a Garden and integrate Navajo language to name vegetables/melons and state numbers in Navajo in order to grasp addition and subtraction with concrete material. Navajo gardening is a tradition that seems to be fading away into the wind. This unit will allow students to create a school garden, and in hopes a home garden to promote healthy eating, cultural relevancy, promote Navajo language, and enhance mathematical concepts in real life experience.

Content Objective

Plant a Garden Unit will focus on understanding Place Value, one and two digit addition and subtraction, along with one to two step story problems. Planning a Plant Garden Unit will be designed for a second grade classroom. It will focus on three main Common Core Mathematic Standards and integrated Diné Standards to make it more culturally relevant. This unit will take approximately 10 weeks with about 120 minutes mathematic instruction daily. Students will be adding or subtracting seeds, vegetables, melons, and weeds. Creating hands on counting and adding or subtracting materials will help students' associate numbers to objects. Using Kinesthetic Learning, students will learn handing verbs with Navajo names of seeds, vegetables, and weeds. Giving students various opportunities to build upon prior knowledge will help students understand composing and decamping numbers in their own Native Language.

Understanding Place Value will be done with seeds in the ones, tens, and hundreds place. Students will be able to convert 10 ones into tens, 10 tens into hundreds, and 100 hundreds into 1000 and vice versa. If students can manipulate seeds in the place value chart, they can visually

see what happens when they compose or decompose numbers in 1 to 3 digit numbers. Being able to count numbers in Navajo will create another opportunity for students to use Native Language.

One, two and three digit addition and subtraction can be done with counting corn, squash, zucchini, watermelon, cantaloupe, string beans, radish, or onions. While planting seeds, students can count how many seeds they put in holes and record that in a journal. During harvest, students can see how much vegetable or fruits were harvested and can record that. Understanding objects to numbers will help students create the value of the number rather than just seeing it as a number to count. Labeling vegetables or fruits in Navajo combined with Navajo number counting can create a deeper understanding of addition or subtraction.

One and two step story problems can be created around gardening. Students will have plenty of opportunities to create story problems about harvesting corn, squash, zucchini, watermelon, cantaloupe, string beans, radish, and onions. They produce differently therefore, students may write one story problem about string beans and then build upon that into a two-step word problem. All students can be assigned a vegetable a week to write about and edit or solve each other's work. After harvesting is over, students can focus more on the subtraction story problems with vegetables and fruits being picked.

Integrating Navajo language into the curriculum will enhance the engagement of students. Counting numbers in Navajo will help students associate that place value numbers fall into. The Navajo (Diné) Language is an Athabaskan Language of the Dene-Yeniseian family according to (Language and Numbers, 2009-2020) According to this website, there are Navajo Numbering Rules. Numbers from one to ten are specific words. When it comes to the ten place value, eleven to nineteen the Navajo suffix is –tsaadah (plus ten) to the specific names of one to ten. Multiple of tens have added the suffix –diin (times ten) to the matching digit of tens. In the hundreds is the same way as the tens by adding –diin (times ten) to ten itself an adding the multiplicative enclitic –di to the matching digit multiplier, and then adding a space to the word hundred. Language and Numbers website gives specific examples of how to name numbers in Navajo. Knowing how to correctly say numbers in Navajo will also students to build upon their Navajo mathematical knowledge and able to visualize the place value according to how to properly say the Navajo numbers. Naming corn, squash, zucchini, watermelon, cantaloupe, string beans, radish, and onions in Navajo will make it more culturally relevant to students.

Teaching Strategies

Diné Teaching styles and strategies are mainly oral, visual, hands on, small group instruction, inquiry based, and cooperative. This unit has many oral teachings and stories. Many stories passed down from generations were from the Whitecorn Zuni Edgewater Clan. The stories mainly pertain to overcoming hardship, being consistence, family nourishment, beauty of life, and prayers. Being in the garden is a time of holiness. It's when a person becomes one with mother earth and nourishment is fulfilled through the food we eat. In the past, corn, squash, and beans were the main sources of plants planted. These are known as the "Three sisters". (Eames-Sheavly, 1993) The stories and history of gardening that I will teach are according to what I learned from my grandparents and have researched.

Hands On learning will include manipulatives such as seeds, weeds, place value blocks, digital manipulatives and planting a garden. Student planting seeds in multiple of 3 or 6 will help

teaching multiple counting. Adding and subtracting with seeds and place value blocks will help students visually see the value to the number. This will really be important when regrouping in place values chart. If students can understand that digits need to be regrouped after 10s and 100s. Using the place value chart and manipulatives, it will give a deeper meaning to numbers. Associating the math vocabulary or garden tools to real life objects makes the connection to math more relevant.

Visual aid to garden tools and vocabulary will enrich students' knowledge. Photographs or pictures to aid in what objects are helps bring meaning to word. Students will keep a journal with vocabulary and math concepts. Many math notes that includes objectives, vocabulary, math skills, and examples on how to solve problems will enhance deeper understanding.

Small group instruction is to have student develop understanding of similar instructional needs with effective strategies with mini-lessons in a small group or known as Cooperative Learning also. Teacher will reteach the lesson and engage in an activity or task to practice the weak skill. The teacher will scaffold the student's knowledge from what they know to mastering the skill to a higher level of competence so student can do skill independently. Multiple practice, questioning, and self-processing will allow students to explore mathematics by doing mathematics. (Sammons, 2010) Effectiveness of Small-Group Instructions enables teachers to differentiate instruction, teaching specific mathematical concepts, teaching with manipulatives, assessing student learning, and supporting the mathematics process standards.

Inquiry Based Learning allows students to be in control of their own learning along with classmates collaborating developing higher-order reasoning. (Calleja, September 2016) This process allows hands-on and problem based learning. My lesson starts with a problem or the question of the day regarding gardening mathematical problem. Students can come up with multiple ways to solve the problem, usually I give students time to think through the problem. I select 4 students to show their unique work on the board and explain their thinking of how they solved the problem. Students do most of the teaching, meanwhile I just target the skills needed to scaffold student learning with modeling and coaching students.

Classroom Activities

Area and Array

Student will plan a garden using graph paper, measuring tape, and math journal. One block will equal one foot. The garden bed will be about 4" X 4" for outside boarders for each child. Students will have to measure using graph papers how much space that is. Ask: How many rows can you make to plant in?

Using selected seeds, students will estimate how many seeds in a hole to make an array, and divide an equal number of seeds to go into each hole. Then, students will arrange the seeds according to how they planned it on graph paper. Either all the same plants in a row or every other one, after reading about Companion Planting and The Three Sisters articles. Students will make garden plots in a ten frame format. So students can seed multiple of five or ten. Later as a class, we can plot our garden on our classroom chart to show how many students planted corn, squash, zucchini, watermelon, cantaloupe, string beans, radish, onions, or fruits. This will allow students to create a pictograph chart, so students can see which vegetable or fruit was planted the

most or least, add or subtract groups of vegetables based on numbers, and write them on place value chart to represent numerals. We can create word problem stories based on the garden pictograph chart. Student can have visual cutouts of vegetable or fruits to show in place value chart and see why we have to regroup if adding or subtracting.

Counting Numeral Objects

Planning to Plant a Garden Unit is a way for students to create a connection between Mathematics and apply it in real life situation. Students need to create a concrete relationship between number and an object starting off with counting seeds. Students will select corn, squash, zucchini, watermelon, cantaloupe, string beans, radish, or onions to plant in their garden. When they have selected the types of vegetables or fruits, students will count the number of seeds needed to plot into the garden. While counting the suggested number of seeds into a hole students will have to write into Math Journal how many more or less they will need of seeds. Students will add how many seed they need for each vegetable or fruit and subtract how many they may not need. This will cover basic computation skills. To make it more complicated, we can complete a class-wide chart of seeds, so they can count up or down two-three digit numbers and convert it into a place value chart. Students will need to be able to represent 257 using 2 hundred seed bags with 3 ten seed bags and 7 seeds for expanded form on the table place value chart. If another student has 162 number of seeds, then they could add and subtract the number of seeds to see regrouping or carrying.

In Journal students will write down name of seed, plant height, and days to germinate. Next to days to germinate students will count on according to calendar to estimate day it will sprout and be ready to be harvested.

Once harvest is here students can calculate female and male squash and zucchini flowers and number of leaves on a stem. Students can count the number of flower buds bloom on each plant and calculate all the flower beds as an individual and as a class. Students can record how many grew or how many didn't or were destroyed. On the corn, students can measure how tall stalk got and how many corn it produces per stalk. Harvested watermelon can be cut up and count up the seeds per watermelon. This will allow students to count fluently, also add the number of seeds or subtract the number of unhealthy or damaged seeds. Students need to be able to associate number with an item. Later, students can make groups of 5, 10, 50, or 100 number of seeds in a bag to practice skip counting, or multiples of 5 or 10.

Navajo Language

Students will learn to count numbers in Navajo up to 10,000. Students will learn how to count 1-100 when counting seeds, fruits, vegetables, weeds, and flower blossoms. Daily repetition of counting in Navajo will help students retain the Navajo Language and applying it daily will help ingrain it so it can become part of the daily language of the students. As a morning bellwork, students can count orally and point to the words on a page to be about to count to 10,000 daily. However, scaffolding for students to count 0-10 to 11-20, 21-50, 50-75, 75-100, then by tens and multiples of 10 all the way up to 10,000. This exercise will help associate students understanding of the number system in English and Navajo.

When adding as a class, students will count in Navajo 1-10,000. Adding various things in the garden or pictures of them in Navajo daily will assist with student's knowledge of addition in according to the place value. As mentioned above in Language and Numbers report the Navajo Math numeration has rules. (Language and Numbers, 2009-2020) Saying numbers in Navajo has them broken up into place value such as eleven to nineteen the Navajo suffix is –tsaadah (plus ten) to the specific names of one to ten. Multiple of tens have added the suffix –diin (times ten) to the matching digit of tens. In the hundreds is the same way as the tens by adding –diin (times ten) to ten itself an adding the multiplicative enclitic –di to the matching digit multiplier, and then adding a space to the word hundred. Knowing this Navajo Rule will give students a deeper understanding of adding objects and understanding the place value of the numeration.

Students will name vegetables and fruits in Navajo. Pictures of vegetables and fruits and the name of it will help students learn the name of them. When they grow out in the garden students will be able to name and count them in Navajo independently. At first, I would model pronouncing the name of the vegetables or fruits, then students can echo read, until students and independently name them.

Students will use handing verbs to ask for vegetables or fruits. Using handing verbs such as shaani'aah (object), shaa nit'iih (slender, sticklike object), shaa nijaah (multiple objects), and shaa niniil (2 objects) are some of the handing verbs students will be using to ask for vegetables or fruits. These are important to know so students can hold conversation with classmates or use at home with family members.

Weed Pulling Contest

Students will have a Weed Pulling contest to work on addition and subtraction. Students will receive a Bashas bag and stand on the start line. When teacher says, GO! Students will count the number of weeds they pulled out with the roots. Plants without roots do not count. When finished, each student will write in their journal how many weeds they pulled. As a whole class, I would have 2 students tell me their total amount and add the digits together. After adding, we will subtract using the sum on top and check our work. After multiple practices, students will work in pairs to add and subtract their weeds. When pencils are down, I will have 4 groups add their digits together and subtract to check their work. As a whole class, 1 student from a group will write their total sum on board and add them all together and subtract to check their answer. Students will subtract how many weeds our class pulled every week. Students will do this weekly and note in journal weekly.

Student Assessment Plan

Teacher Made Test: I will be creating a teacher made assessment based on pictorial images focusing more on farming based on three-digit number charts with cut and paste format or write in. Students will have examples of addition and subtraction within 100 to solve one and two word problems by it drawing out. Students will have 5 questions on the paper test. Daily target fluency addition or subtraction with in 20 by using a weekly 3 minutes timed test.

Informal Assessment with Google Meet questions and discussion conversations. Teacher posing open ended questions will allow students to share what they know, peer teacher, and assess who needs to get additional instruction.

Interactive assignments such as posing a classroom questions and watching students solve and present answers allows teacher to assess student's understanding. Some examples I have students solve and share their thinking with class. After several examples, I'll model how to solve problems in multiple ways with drawing a picture, using place value chart, and tape diagram. I'll have about 3-5 examples that we do as a class based on random student's being called upon. Students practice solving math problems.

Exit Tickets are designed to have 3 problems based on the skills that were taught for that day. The Exit Tickets will be based on one thru three digit addition/subtraction based on one or two step word problem designed from garden stories. Teacher will have some created and then later students will have to create their own one or two step word problems for other classmates to solve.

Ixl.com website can assess specific skills that can be starred for students to target the concept that needs to be assessed. Students can work on standard until mastered. Ixl.com allows students to practice skill for the week. When students make a mistake, there is an explanation on how to solve the problems, until mastered and given 100% ribbon. Students will earn little prizes when they have mastered the standard. Teacher will easily be able to see who has mastered or still struggling with concept.

End of Unit Test will assess about 3-5 lessons to make sure students have grasp the concepts. The End of the Unit Test has about 10 questions that target the skills students should master. After students complete it, teacher can fill in chart to see where whole class is struggling so it can be retaught so kids can master skill. This also allows teacher to create small group to reteach targeted skills and retest.

Northwest Evaluation Association (NWEA) is a global research-based adaptive assessment that is a state aligned, computerized adaptive test. The test will assess student's knowledge to reflect their instructional level and growth they could make. Teachers will get a data printout of class report that states how each student or class did on specific standards. From their results teacher can group students based on ability and teach from the RIT score and what MAPs Skills they need to work on. Once students have mastered the skills in that RIT band, they can be scaffold up. This assessment tool will help students, teachers, and parents increase student knowledge.

Alignment with Standards:

According to our NWEA data, students score below average (RIT 161-171) on Math- Operations and Algebraic Thinking and Number and Operations, where end of year RIT Goal for 2nd grade is 198. The Arizona Common Core Mathematic Standards to target are:

2.OA.2 Fluently add and subtract within 20.

2.NBT.1 Understand three-digit number represent amounts of hundreds, tens, and ones.

2.OA.1 Use addition and subtraction within 100 to solve one and two-step word problems.

DINÉ STANDARDS

Standard Culture: Students will develop an understanding of Diné way of life.

S1.C2. PO1 I will use my cultural teaching about how to take care of earth and sky.

S1.C3.PO3. I will name the various plants within my surroundings.

Standard: Oral History Students will utilize the Navajo language and culture. Students will listen, communicate, observe, and understand what they are being taught.

Concept 1- I will listen to and understand the basic Diné oral language.

PO4. Students will respond accurately to commands and instructions.

Resources

Eames-Sheavly, M. (1993). *The Three Sisters; Exploring an Iroquois Garden*. A Cornell Cooperative Extension Publication.

Howe, R. (2018, August 29). Learning and Using Our Base Ten Place Value Number System: Theoretical Perspectives and Twenty-First Century Uses. *Springer*, 57- 68.

India J. Ornelas, K. O. (2018, May 19). Gardening for Health: Patterns fo Gardening and Fruit and Vegetable Consumptions Among the Navajo. *Journal of COmmunity Health*.

Language and Numbers. (2009-2020). Retrieved from <https://www.languagesandnumbers.com/how-to-count-in-navajo/en/nav/>

Sammons, L. (2010). *Guided Math; A Framework for Mathematics Instruction*. Huntington Beach: Corinne Burton, M.