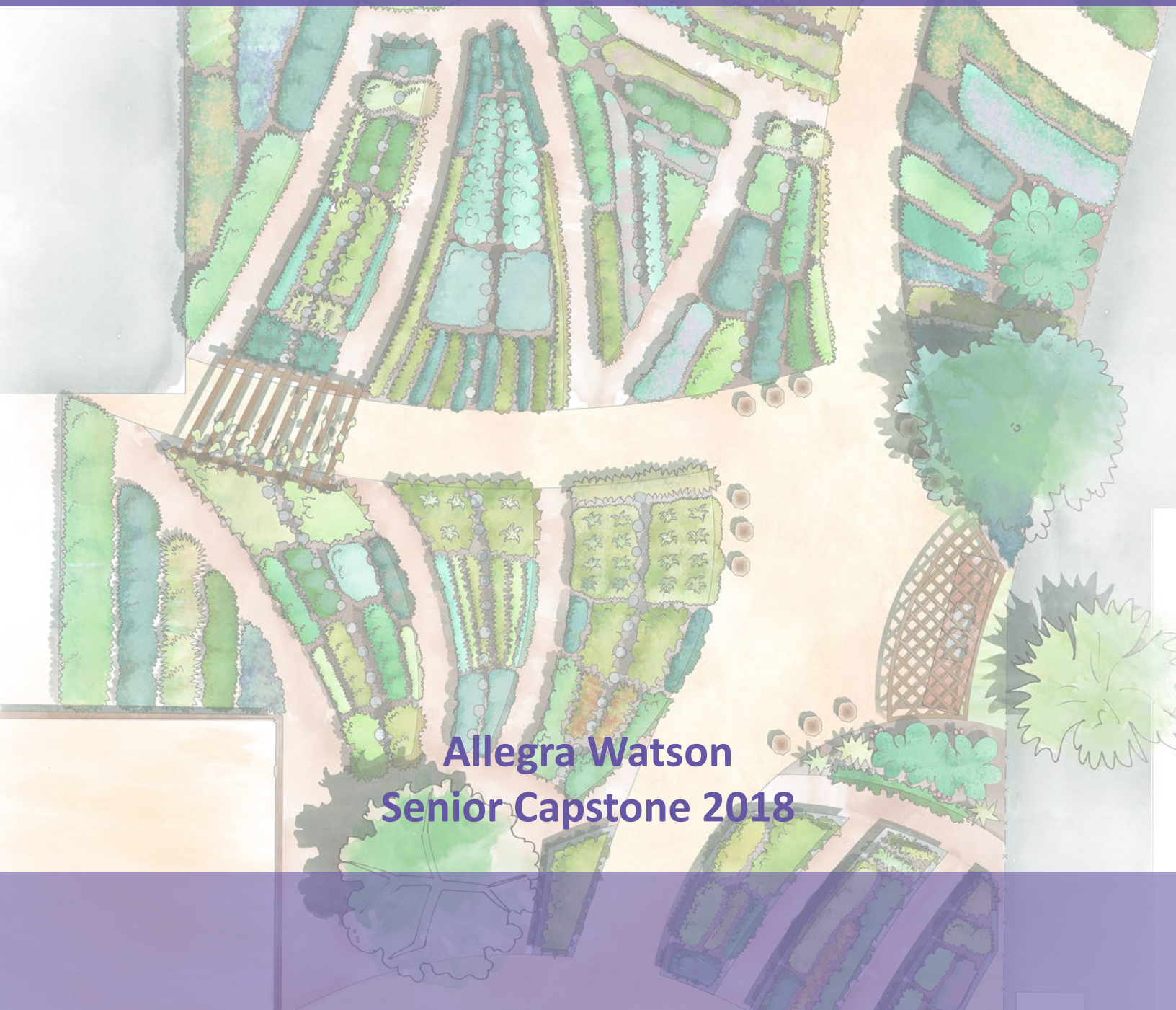
CULTIVATING CULTURAL LEARNING IN SCHOOL GARDENS



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CULTIVATING CULTURAL LEARNING IN SCHOOL GARDENS

by Allegra Watson

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ABSTRACT

School gardens are a great way to provide hands on, interactive learning for kids and they can serve as safe spaces for people to interact with one another. However, these landscapes have not been utilized to their full potential quite yet, as most in California still do not emphasis culture. Elementary education is an important time to foster empathy as well as teach cultural comptency so future generations will not have the current hate and prejudice that is present today. After reviewing literature and interviewing educators, I designed a school garden at an elementary school in Woodland, California, where many hispanic and latinx people live, and documented this experience and ways to practice cultural competency in school gardens. This design provide space for students to learn about diverse cultures as well as provide a tool for other designers and educators to use in their school garden program.

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INTRODUCTION

In the United States, the school environment has been formed by a westernized culture and is a very different environment than many students of color experience at home. In California, the lack of a robust representation of people of color in school curriculum in addition to the sterile asphalt and grass of school landscape creates a space that is not welcoming or inclusive to diverse students that make up these communities. Students of these diverse cultures often suffer from this environment and perform poorly in school. Many latinos and other minority groups are experiencing prejudice in schools as other kids continue to judge them based on the appearance of their skin (Deeb Sossa, 2018). Some teachers continue to teach with cultural destructiveness, claiming cultural blindness and ignoring the obvious and unique differences of their students (Bustamante, 2009). It is imperative that youth learn about cultural competency and empathy especially during this era when the United States president has sparked hateful and prejudice acts (Clark Minok, 2017). This project addresses the need to include diverse voices and cultures in schools in order to create understanding and empathy of different cultures. I intend to utilize the landscape of a school garden as a way for teachers to practice cultural learning with students.

Despite the rise in school gardens in the past couple decades, there is still a lack of widespread cultural emphasis in these gardens. The curricula often favor European history over others and utilize examples that are mostly of the European and American experience. School gardens still use Western agricultural practices and grow a limited amount of fruits and vegetables that are often present in mainstream supermarkets. One economic study that examined the variety of vegetables that sample of families bought at a supermarket only had 24 types of vegetables in the store (Hayden, 2005). Parents and students from diverse cultures do not see themselves represented in these school gardens, creating a disconnect between their home life and school life. This presents a problem especially in California where there is great cultural diversity in schools and the overall population. In 2014, Census estimates found that the Hispanic population surpassed the non-Hispanic white population in California at 15 million compared to 14.9 million (Reese). Now is the time to begin creating gardens that reflect the population of California as our demographic has already changed and will continue to change given “minority” populations are the majority. In order to address this problem, I researched how other public gardens such as community gardens are addressing culture, how culture can be incorporated in a way that promotes equity, and how to get the community more involved in the school. To achieve this, I define cultural learning and culturally responsive teaching as an ongoing process and show how this how this can be applied in the physical and intangible programming of the garden.

THEORETICAL FRAMEWORK

The theoretical framework behind this project is based in aspects of learning, landscape, and gardening itself. Gardens have been used to expanded upon curriculum standards in many schools, allowing students to experience the natural processes around them. I would like to help students experience and express culture by creating a sense of empathy and inclusivity to foster equity in a school setting. Gardens are conducive to practicing cultural competency as food is often a gateway to learning about new cultures as well as sharing one's culture with someone else. The garden itself is a way to bring many people together from different backgrounds and create connections and relationships that participants wouldn't have otherwise. In a study at UC Berkeley by graduate Emily W. McMane, the garden setting enabled child participants to practice social interactions in the garden setting (43).

David Sobel's theory of developmentally appropriate stages of teaching explains that between 4-11 years of age is the time to teach empathy and exploration. He advocates for place-based, experiential garden learning as an effective way to teach empathy and encourage exploration in his book Childhood and Nature. Therefore, elementary is the ideal time to begin teaching cultural competency as it involves empathy and exploration of other cultures. My project is also based on the theory of landscape as language from Anne Whinston Spirn. Landscape can be formed and read in a certain way. For example, many plants used in current landscapes have been brought over from Europe and other countries for horticultural aesthetic uses. Many institutional landscapes has been shaped with symmetry and straight lines, reminiscent of the French royal landscapes. The design imposed on the landscape is very far removed from the Native American land uses and other cultures around the world. Diverse cultures have developed unique relationships with the land that are not reflected in the current California landscapes in schools. In eurocentric america, our landscapes fail to include diverse cultural elements and relationships, creating an isolating and unfamiliar place for other cultures.

RESEARCH QUESTIONS

My primary research question asks how can cultural learning be incorporated in the design and landscape of public gardens? I create guidelines on how to use landscape as a tool to learn about culture in a respectful and inclusive way in school gardens. There are many elements to landscape such as plants, materials, signage, color, and scent. I use principles of culturally responsive teaching and cultural learning spectrum and diverse foods to emphasize culture and representation in the garden. The spectrum of cultural learning addresses the fact that there are multiple levels of understanding and interacting with other cultures. My subquestion asks: How can I apply this to foster community engagement and inclusion through the practice of cultural competency in a school garden in Woodland, California? In order to answer these questions and design the school garden at Maxwell Elementary School in Woodland California, I met with key members of the school and reviewed literature about public gardens, garden programs in California, and cultural curriculum and learning.

PUBLIC GARDENS

Fig 1: Cultural Community Garden in New York

Public gardens by nature are inclusive because they draw people from different backgrounds who share the same interest in growing their own food. They create a safe space for those who participate in the communal gardening to interact and learn about one another's cultures (McMane, 2013). One main difference between community gardens and school gardens is that those who are interacting in the community garden decide what they will grow, while in school gardens, there is often a teacher or parent deciding what will grow in the garden. Youth can still interact with others and learn from each other, but if they do not have any say in what is planted in the garden, they may not have the variety like the food grown by the community gardeners.

Through school gardens, educators are able to teach environmental science, nutrition, and core subjects curriculum in a innovative way. However, gardens still have not reached their potential to teach culture using diverse agricultural practices.

CULTURAL GARDEN PRECEDENTS

To understand the current situation of cultural gardens, I sought out examples of school gardens both outside the United States and within Northern California. The first cultural garden example was implemented at Dalem Primary School as a part of a larger Multicultural School Garden Program, in the Dandenong Region of Melbourne, Victoria, Australia. This school is located in one of the most culturally diverse areas of Australia, and has a prominent English Learner student population as many are immigrants from other countries such as Afghanistan and Sudan. The multicultural garden was only associated with the English as a Second Language program at the school (Cutter-Mackenzie, 2009). In the process of creating and using the garden, the researcher found that preparing food at the garden kitchen encouraged dialogue and sharing of cultural customs between students of different cultural backgrounds. The students felt a sense of responsibility and connectedness to the environment after their work in the garden. The garden also provided another learning opportunity for the students to practice their English (Cutter-Mackenzie, 2009).

To find out more about Northern California school gardens, I attended the 'A Garden in Every School Symposium' on March 10th and 11th, 2018 and spoke with educators who teach in the diverse schools in Sacramento. In Sacramento and West Sacramento,

Fig 2: Sunshine North Primary School Garden Students, Australia

Fig 3: Students working in Luthar Burbank Urban Garden, aka. B.U.G.

there are large communities of African American, Hispanic and Latino/a, and Hmong people. Educators from John Still Middle School were highly interested in ways to involve parents at their school. One educator had worked at an elementary school previously that had a community garden in which Hmong parents were heavily involved in the creation and maintenance of. At Luthar Burbank High School, there had been a strong initiative from the students themselves to claim a space in the garden for growing their cultures food. The Hmong language class created a space in the garden to grow plants significant to Hmong culture and had assignments to research these plants. Both African American and Latinx student communities approached the director with the idea of cultivating a plot in the garden for their cultural communities within the school. Even though there is a cultural presence in the garden now, the school and garden program did not take the initiative to actively provide an inclusive space or a space for learning about culture. It is possible that they may not have actively promoted culture in the garden because they did not have the resources or time available to consider culture as it is not emphasized in many garden based learning curriculum.

NORTHERN CALIFORNIA GARDEN PROGRAMS:

In Northern California, there are many schools receiving funding for school gardens. Garden programs have been mainly focused on nutrition and environmental science. This is very important to youth as it addresses the obesity epidemic and reconnects youth to the natural environment, inspiring them to take care of the earth. However, not many programs have incorporated cultural or the idea of cultural competency into the garden. Many organizations that support school gardens with resources and lessons focus on nutrition and learning about the science of the natural environment. For example, Life Lab, a garden learning organization based in Santa Cruz, has many lessons on pollinators, soil and habitat. Their mission statement is to “cultivate children’s love of learning, healthy food, and nature through garden-based education” (“Life Lab”).

These topics are very important to students education, but to include those from a diverse background and introduce youth to other cultures, there needs to be an emphasis on culture in the garden and how to utilize the landscape in the garden in a way that youth will develop an understanding and respect for others. There is a need for more diverse teachings of cultural ways of agriculture, food, and connection to the earth.

CULTURAL COMPETENCY

It is essential to define "cultural competency" and the principles of its practice. In my literature review, I discovered that the Barr Foundation, a Boston, Massachusetts based private foundation involved in experiential learning, had defined this term in the context of environmental education programs. They see cultural competency as "an ongoing process of developing awareness, behavior, structures and practices that allow an organization or program and its members to reach or engage diverse groups and communities in relating to the natural and built environment and in environmental stewardship"(4). Instead of an end goal, cultural competency is something to be constantly practiced and developed. It has multiple levels ranging from individual to an organization's relationship with the community (Barr Foundation 2006, 6). To determine the level of cultural competency in environmental education programs, they studied three programs in Boston: CO-SEED, Urban Ecology Institute, and Boston Nature Center. They created a set of principles of cultural competency to measure the practice and progress of cultural competency in these programs. These were divided into 5 levels: individual, interpersonal, program, organization, and organization relationship to the community.This literature provides a basis for understanding cultural competency in the context of public gardens.

Another piece of literature that sought to define principles of cultural competency is from the Child Welfare Information Gateway, a US governmental organization. One of their definitions of cultural competency is "the capacity to value diversity, conduct self-assessment, manage the dynamics of difference, acquire and institutionalize cultural knowledge, and adapt to diversity and the cultural contexts of the communities served" (Guiding Principles). In this context, the act of institutionalizing cultural knowledge is a part of practicing cultural competency. Incorporating culture into school gardens and curriculum is itself a beginning to institutionalizing cultural knowledge. They also acknowledge the importance of understanding the context of different communities. Community is ever changing and needs to be periodically re-examined to adapt to cultural changes.

Cultural competency can also be expressed in the design process of programs and landscapes of school gardens and other public spaces. In Julian Agyeman's article, "Interculturally Inclusive Spaces as Just Environments," the Tufts University Urban and Environmental Policy and Planning Professor writes that it is important to include diversity is respected and considered throughout the process of planning and creating new public landscapes (2017). He also recognizes that community collaboration and inclusion often fails to continue beyond the design phase. Therefore it is important to not only include diverse groups of the community in the design phase, but also create a plan for after the design is implemented.

CULTURE AND EDUCATION:

Cultural competency is a common term used to promote cultural learning. However, this term is limited in its understanding of the complete cycle of cultural learning and how this might be taught in the curriculum of schools. Cultural competency is often thought of as an end goal, but is in actuality only one stage of cultural learning. In this section, I describe two aspects of cultural education: culturally responsive curriculum and the cultural learning spectrum. These two components will provide insight for the creation of a school teaching garden that incorporates culture in an educational and exploratory way and is inclusive to the many cultures present in California.

CULTURAL LEARNING:

When addressing cultural learning, it is important to recognize that there are different stages of cultural learning and that not everyone may be at the same stage. As defined by the Women of Color Network, there are 5 stages on the cultural learning spectrum (Lopez, 2017). These are cultural awareness, cultural competency, cultural humility, cultural relevance, and cultural specific. The first stage, cultural awareness, is about thought. At this stage, one develops an interest in other cultures, but does not necessarily know how to interact with or understand other cultures. Cultural competency is when the individual actively learns and

Fig 4: Cultural Learning Spectrum Stages

understands how their actions may impact other cultures. At the third stage, humility, the individual gains a respect for other cultures and works to become more accessible to these cultures. The cultural relevance stage is where an individual or organization includes elements from different cultures in the space they work in and actively incorporates the advice and voice of the various cultures they serve. The last stage, culturally specific, is when the individual becomes an ally to people from other cultures and supports their cultures preservation and self-sufficiency (Lopez, 2017).

CULTURALLY RESPONSIVE CURRICULUM:

Another important aspect of teaching is the creation of culturally responsive curriculum to form an inclusive environment for students of all backgrounds. As authors Irvine and Armento explain in their book, Culturally Responsive Teaching, there are three components to consider in order to create culturally responsive curriculum: instructional examples, student engagement, and assessment. In education, it is important to include many different types of teaching examples to insure that many perspectives and experience are acknowledged. This can take the form of providing different cultural examples, sharing alternative perspectives, discussing diversity and commonalities within a certain subject, or utilizing student generated, culturally relevant examples (Irvine, 2001). The second aspect of creating culturally responsive curriculum is student engagement. To maintain engagement in the curriculum, a teacher should incorporate multiple learning preferences and modes and create activities that can be completed by an individual student, a team, or with the entire class. The teacher should allow for student decision making and engage students in cooperative competitive activities. In the assessment portion, teachers actively and continuously assess the curricula and employ a range of materials and tactics for assessment, analyze feedback to incorporate into their instruction, include special accommodations for special learners.

SITE ANALYSIS

There are plenty of schools in California that I could choose to design a garden for. However, I decided that proximity to Davis and the presence of a mostly underserved and diverse student population were the most important in a school that I would design for. I contacted the Yolo County Office of Education to inquire about possible schools to design a garden for. The Director of Curriculum and Instruction connected me to the school of Rhoda Maxwell Elementary, a school which had recently held a fundraiser and entered into a partnership with Yolo Farm to Fork to be a part of the 'Growing Lunch' program. The fundraiser raised enough money to pay a parent garden program coordinator to relaunch the abandoned garden at the school. The school has many Latino students and many students participating in the free and reduced lunch program, meeting my criteria for the ideal school to design for.

In order to understand my research site, I studied and researched the school garden, Maxwell Elementary, and the City of Woodland (Fig #). Woodland was named for its oak trees that dotted the land. This name was thought of by the wife of businessman, F. S. Freeman, after Founder Henry Wycoff sold the town to him. Before it was named Woodland, the city was called Yolo City ("History of Woodland"). The word, Yolo, in the local Patwin Native American language meant to wait, as the native americans would have to wait for long periods of time here in order to hunt the deer that passed through the Sutter Buttes. Another source says that the name may have come from the word Yo-loy, meaning "a place abounding in rushes" (Ferguson). Cache Creek, which runs Northwest of Woodland, was were many native americans lived off of the land. However, when settlers took over the land, they found that it was very suitable for agriculture and a high ground to avoid the flood of the creek. They cleared many of the oak trees to develop the land. This created the town of Woodland and with an abundant agricultural business, many Hispanics and Latinos have found work here. As there is a rich history of Native American people and Latino culture in Woodland, I intend to highlight these cultures in the garden as well as in the guidelines I create to promote cultural competency in school gardens.

Woodland Elementary school has many Latino and Spanish speaking students, making it an ideal place to incorporate education and plants of various cultures, emphasizing those present in the school (see Fig #). As of 2017, Latinos make up 72% of Maxwell's students, 34.1% of students are English Learners, and 73.8% of students receive free and reduced lunch ('Rhoda Maxwell'). Currently, Maxwell has some existing infrastructure for a school garden such as plant beds, water spigots, and a gate (Fig # and Fig #). However, it has not been used in several years and few plants are growing. This space is an opportunity to revitalize the school garden and improve school

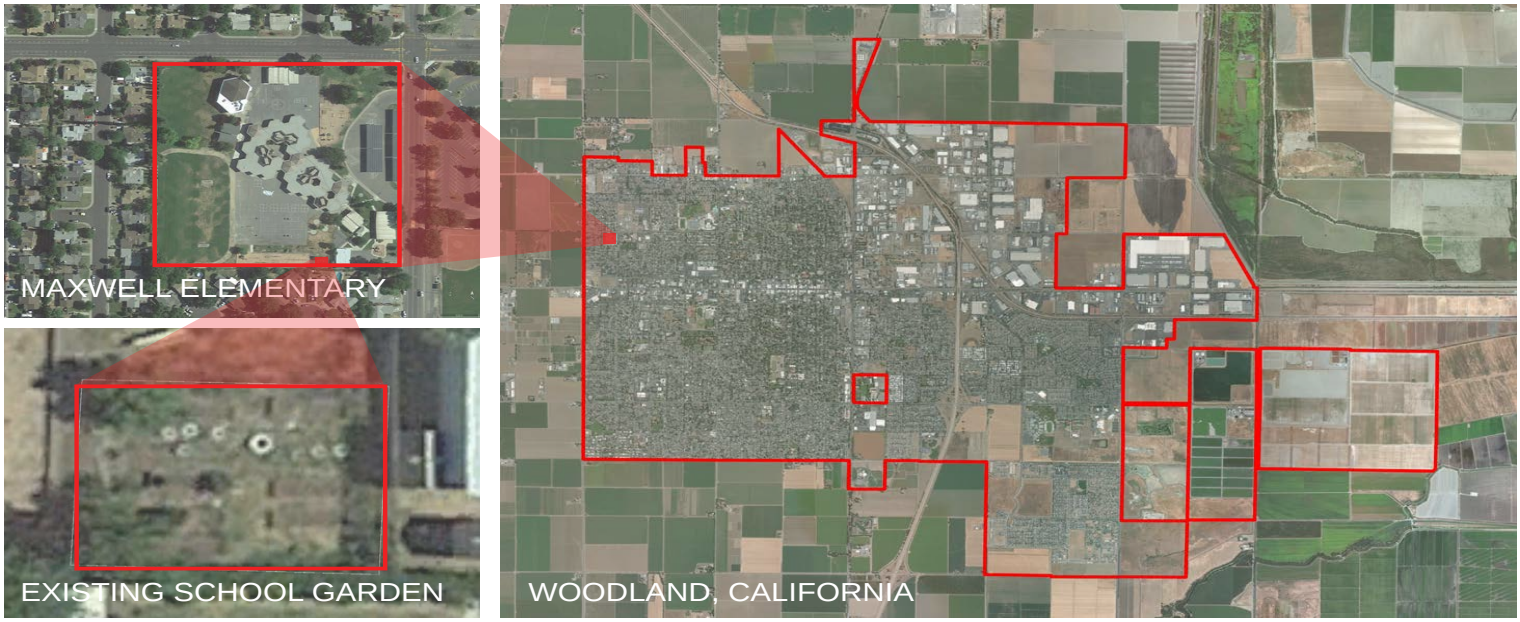

Fig 5: Context of Maxwell School Garden

Fig 6: State of Maxwell's Abandoned Garden, December 2017

education and community connections. There is also plenty of space to potentially expand the garden in the future (Fig #). While there is a large Hispanic population, there are not many other ethnicities have a large representation besides Caucasian. I used this to my advantage by incorporating plants from many cultures in the garden despite the limited diversity of dominant cultures present in the school. Creating a space for cultural learning is essential in creating equity and is important to teach in schools no matter the diversity of the school.

There are many programs and committees currently at Maxwell that are anticipating the garden's revitalization. These include the Parent Teacher Association (PTA), Yolo Farm to Fork non-profit (YF2F), English Learners Advisory Committee (ELAC), After School Education and Safety (ASES) program. During the time I have worked on this project, I have maintained contact with the program coordinator of Yolo Farm to Fork and the parent garden program coordinator, who also is a part of Maxwell Elementary PTA.

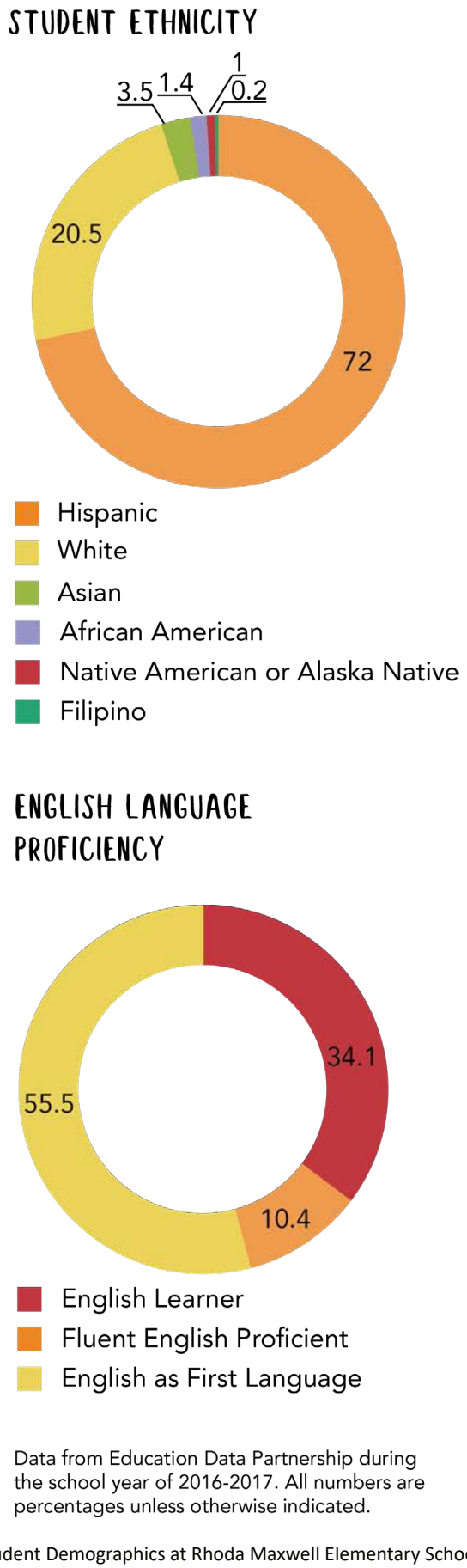

Fig 7: Student Demographics at Rhoda Maxwell Elementary School

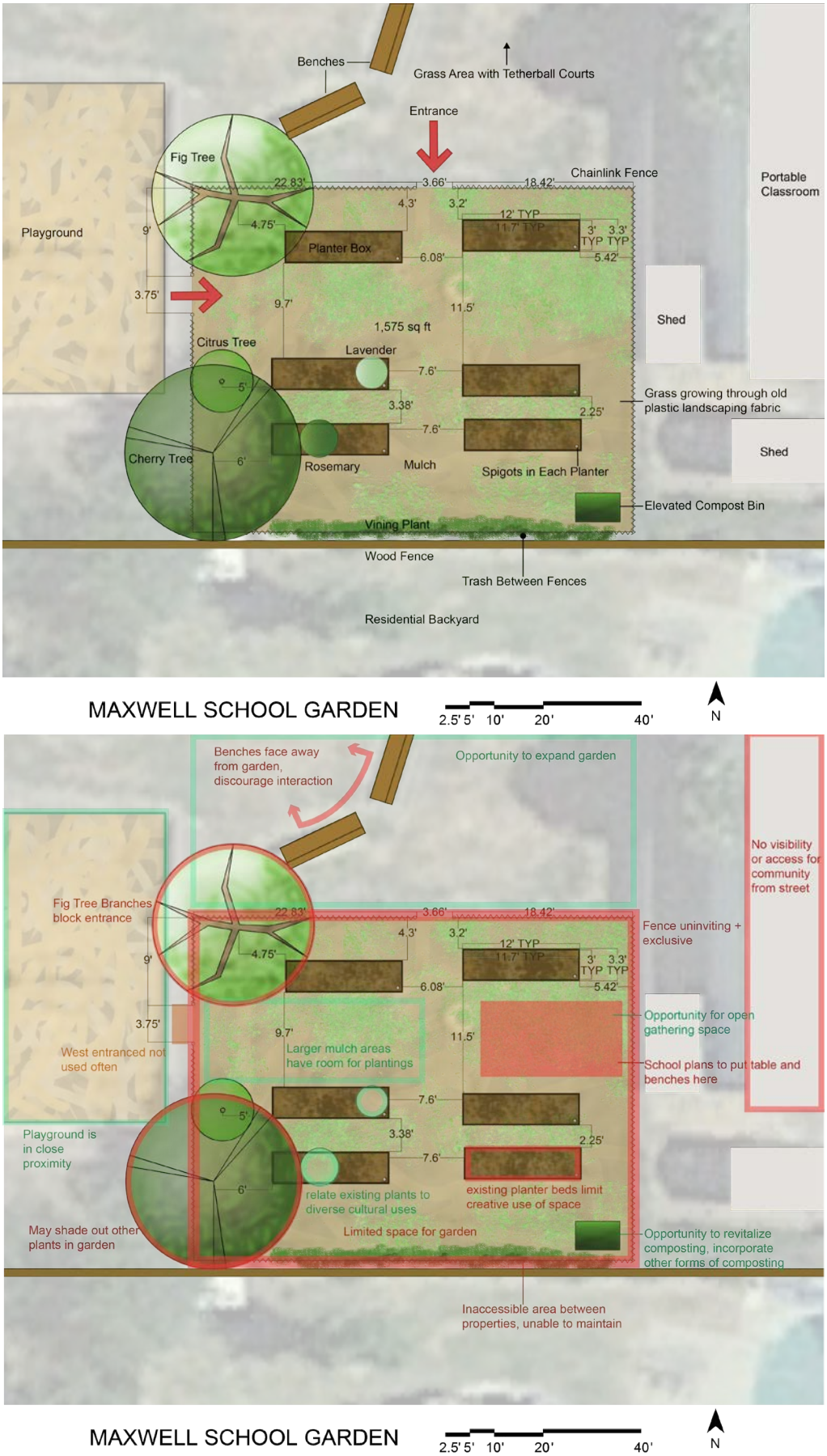

Fig 8: Garden Site Inventory and Analysis

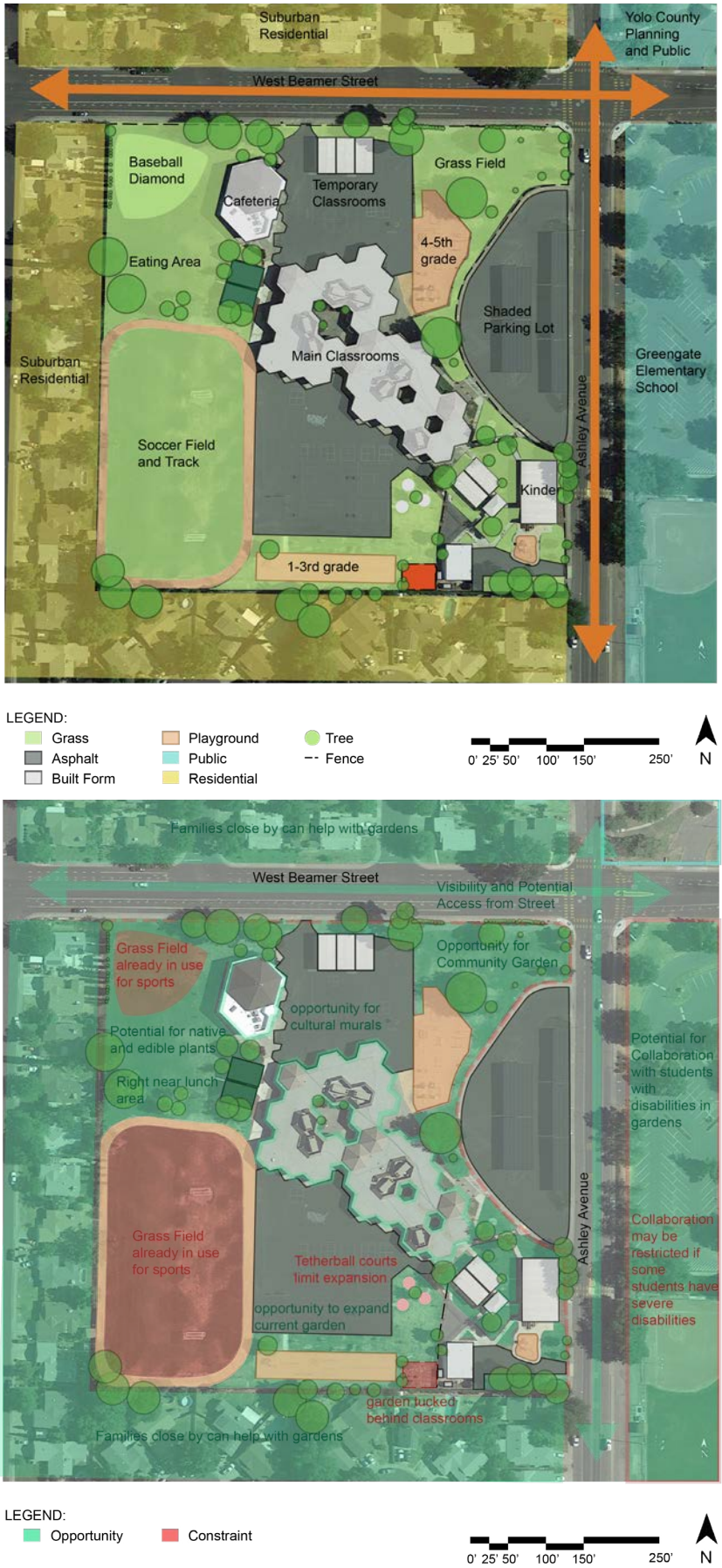

Fig 9: Maxwell School Inventory and Analysis

OPPORTUNITIES AND CONSTRAINTS

Fig 10: Student workshop at TANA

Fig #: View of Cache Creek Preserve, a historical site of Native Americans

To design within the context of Woodland California, I examined the opportunities and constraints of the City of Woodland, Rhoda Maxwell Elementary campus, and the current garden site. There are plenty of opportunities at Maxwell Elementary School for connections within the community. The City of Woodland has a network of schools that can be used to connect with other students as well as maintain the garden. The organizations based in Woodland, including TANA, or Taller Arte Del Nuevo Almanacer, a Chicanx Art Collective, can provide more collaboration and cultural experience for students in the garden. They can create artwork that represents Latinx and Hispanic culture and inform the garden space in other artistic and cultural ways. The nearby Woodland Community College and its Chicanx and other cultural departments can form relationships with the school to facilitate cultural events and curriculum in the garden. The Cache Creek Conservancy and Nature Preserve nearby can also provide information on the Native American ways of life. Patwin/Wintun native, Diana Almendariz, who helps out at the Preserve, has a wealth of knowledge in the traditional foodways of her native people.

On Maxwell's campus itself, there is room to expand the garden. The current abandoned garden is tucked away between a playground and the fence of the kindergarten teaching area of Maxwell.However, there is a grassy area in front of the current garden

that could be utilized in the future design of the garden to create a larger space in which the community and students can use to interact with people and plants from other cultures. Even though there are three tetherball courts that use the grassy area as well, movement in the game of tetherball is generally contained to the circle as the ball is attached to a pole. This provides another opportunity to incorporate the space around the courts into the garden. There are many active areas around the garden like the tetherball courts, basketball courts, and playground. This provides connectivity to other student recess activities. There is also easy access to the garden from the kindergarten area and some of the classrooms at Maxwell as they are in close proximity to the garden.

With the current state of the garden and the short time in which I have to complete this project, there are certain constraints in the design and implementation of my design. I created a future design plan of the garden that the school can draw inspiration from, rather than fully implementing my design at the school. The garden already has 6 garden planter boxes in place and the garden coordinators have expressed that they would not like to move the boxes. Time is another constraint as I only had ten weeks for my project. Despite some funding at the school to revitalize the garden, expanding the garden as much as I would like, would take a considerable amount of time and money that the school does not currently have.

GARDEN DESIGN PROCESS

My garden design centers around programming and cultural plants arranged in the garden to support and encourage cultural learning in an inclusive space. To achieve this, I gathered information about culturally significant plants from books, websites, and individuals from different cultures. I sat in on both Parent Teacher Association and English Learner Advisory Committee meetings to gain a better understanding of their cultural context and preferences for the garden. From the meeting with the English Learner Advisory Committee, I found that the parents expressed an interest in setting up a schedule in which they could help maintain the garden. The parents also said they would like to grow radishes, peppers, and other vegetables used to make salsa. When I brought up the opportunity to work with TANA, the Chicanx art workshop in Woodland, some wanted to see recycled art. I also have had meetings with the Parent Garden Program Coordinator and Yolo Farm to Fork Program Coordinator to stay up to date on the progress of their garden program. From these meetings I have learned that the teachers of Maxwell want sensory plants to aid their autistic students in experiencing and understanding the different senses. In addition to this, I contacted Melissa Moreno, an Ethnic Studies Professor at Woodland Community College. She shared with me the names of the seven warriors of Mesoamerica: corn, bean, squash, cactus, amaranth, chia, and chiles. All of these were the superfoods in the indigenous diet and are of cultural significance to many Latin Americans. To bring in another cultural expert, I got in touch with Diana Almendariz, a woman of Native American descent who works at the Cache Creek Conservancy near Woodland and educates the public about Native American history and culture. By speaking with her and reading other supplementary sources, I learned more about the plants culturally significant to Native Americans and determined which plants to include in the garden.

CULTURAL PLANTS

For each plant I have included in the garden, I documented the origin of the plant and the cultural significance. I focused on the ethnicities present at Maxwell Elementary School and Woodland to form the plant palette. These ethnicities include Hispanic, European American, Pakistani, Asian, Native American, African American, and Filipino. These were organized into 6 main origins represented in the garden: North America/California, Mesoamerica, South America, Asia, Africa, and Europe. The Americas are a main focus due to the large Hispanic student population and strong history of Wintun/Patwin people in Yolo County, California. The following cultural significance of each plant is not an extensive or complete description, but a sample demonstrating how each plant can have significance among many cultures. I purposefully organized these plants by their origin to avoid confining plants to one culture. This organization also allows students to share their personal experiences and cultural understanding of each plant.

Fig 12: Blue Elderberry, *Sambucus nigra ssp. caerula*

Fig 13: Blue Oak, *Quercus douglassii*

Fig 14: Butterfly Milkweed, *Asclepias tuberosa*

Fig 15: Farewell to Spring, *Clarkia ameona*

NORTH AMERICA/CALIFORNIA

The plants of North American/Californian origin include Blue Elderberry, Blue Oak, Butterfly Milkweed, California Blackberry, Farewell to Spring, Redmaids, Sunflowers, Tule Mint and Yarrow.

Blue Elderberry has a variety of uses in native american culture (Fig. 12). The stems and branches were used to make baskets and musical instruments such as clapper sticks and flutes, while the berries could be dried or cooked and flowers could be eaten raw, or used to make tea (Stevens, 2016).

Blue Oak grow acorns that the Native American people used as a staple food in their diet (Fig. 13). Branches were used for construction materials, and the inner bark was used to relieve arthritis by the Kawaiisu tribe in Southern California (Anderson, 2009).

Butterfly Milkweed was used by Native Americans as a salve or tea to treat swelling and rashes or stomach pains (Casey, 2010, pg 22). In addition to its cultural value, Butterfly Milkweed is an important plant for Monarch caterpillars to feed off of before they transform into butterflies (Fig. 14).

Farewell to Spring (Fig. 15) and Redmaids (Fig. 16) are wildflowers with nutritious seeds. Farewell to Spring's seeds were used by the Sierra Miwok native americans in offerings and ground into a seed flour

meal to be eaten (Young-Mathews, 2012).

Native Americans would collect Redmaid seeds to eat and the Chumash tribe used them in ceremonies. Red maids leaves were also eaten but in small quantities, due to their high oxalic acid content (Immel, 2006).

The Sunflower is from North America, but it is also sacred to many native peoples in Meso and South America to honor their sun deity and used as an addition to the three sisters plantings of corn, squash and beans (Fig. 17).

Tule Mint (Fig. 18), also known as Corn Mint, is another plant important to the Native Americans, and was used by the Cheyenne Native Americans in tea for its medicinal and antiseptic properties ("Wild Mint").

Yarrow is an important plant to the Native Americans in California, as it was used for its medicinal properties (Fig. 19). Many Native American tribes usedthe anti-inflammatory leaves topically as a first aid for scrapes and burns as well as internally for aches and pains (Reid et. al, 2009).

Fig 16: Red Maids, *Caliandrinia ciliata*

Fig 17: Sunflower, *Helianthus californicus*

Fig 18: Tule Mint, *Mentha arvensis*

Fig 19: Yarrow, *Achillea millefolium*

Fig 20: Amaranth, *Amaranthus cruentus*

Fig 21: Chia, *Salvia columbariae*

Fig 22: Cushaw Squash/Pumpkin, *Curcurbita agyrosperma*

MESOAMERICA

Plants from Mesoamerica include Amaranth, Chia, Cushaw Pumpkin, Jalapeño, Sonoran Gold Tepary Beans, Teosinte and Corn, and Tomatillos. All of these plants were recommended by Melissa Moreno, Ethnic Studies Professor at Woodland Community College, who is of mesoamerican descent.

Amaranth was used in religious rituals in indigenous cultures. Because of this, it was outlawed by Spanish conquistadors (Fig. 20). Amaranth seeds are considered a superfood, like many of the other plants included in the mesoamerican plant section and is called huautli in the Aztec language (Bruce, 2014). It is currently being grown in Oaxaca, Mexico with the three sisters: corn, squash, and beans to reintroduce it as a staple food.

Chia is another important plant, especially to the Aztecs who used the seeds in sacrifices and ceremonies and the Mayans who used the plant in a drink called Iskiate, made of water, lemon and chia seeds, for the strength to run long distances ("Chia Seeds"). Chia was also outlawed for a time by conquistadors because of its sacred significance to the indigenous peoples (Fig. 21).

Cushaw pumpkin or squash is important to both North American native peoples and Mesoamericans (Fig. 22). The Tohono O'odham native people in Arizona use the squash blossoms, young fruits, ripe

fruits and seeds (Mogul, 'Tohono'). Unripe fruit is sometimes eaten boiled, while the ripe fruit can be used in sweets. The seeds are eaten whole are used as the main ingredient of sauces for stews such as mole verde. The seeds contain a high oil and protein content, and are important to the diets of manypeople in Mesoamerica. In Yucatán, the flesh of the cultivated squash is used to treat burns and sores (Saade).

Jalapeño (Fig. 23) has a long historical significance that dates back thousands of years in mesoamerica (Powis, 2013). The Aztecs used jalapeños prior to the Spanish conquest, making mole from smoked jalapeños, or chipotles and fresh chilies (Bosland, 1999).

Tepary beans, such as the Sonoran Gold Tepary Beans, were first domesticated in Tehuacán Valley, and used by indigenous peoples in south-western United States and northern Mexico for at least 2,300 years (Mogotsi, 2006). Tepary bean has been introduced to Africa, Asia and Australia and is now cultivated in these continents. Tepary beans (Fig. 24) can be mixed with maize and used in stews and soups, or eaten as a green bean or bean sprouts. Due to its high nitrogen content, it can also be utilized as a cover crop in agriculture.

Fig 23: Jalapeño, *Capsicum annuum 'Jalapeño'*

Fig 24: Tepary Bean, *Phaseolus acutifolius*

Fig 25: Teosinte, *Zea mays sp parviglumis*

Fig 26: Tomatillo, *Physalis ixocarpa (purple fruit), philadelphica (green fruit)*

Teosinte is known as the wild ancestor to domesticated corn (Fig. 25). It is called Teocintle and said to be the grain of the gods in Mexico. Indigenous seed keepers and cultivators domesticated this plant 10,000 years ago to create the diverse selection of corn that we have today (Neff, 2018). In Mesoamerica and South America today, corn remains a staple food that many people grow to survive off of (Santina, 2006).

Tomatillos actually originated in Northern America and were used by south western indigenous peoples (Fig. 26). However, tomatillo were cultivated in the Tehuacán Valley in Mexico and were an important food to the Aztecs. In the Uto-Aztecan Nuahatl language the plant is called 'tomatl,' and is the origin of the word tomatillo (Mogul, 'Tepehuán').

SOUTH AMERICA

The plants originating from South America include Bell Pepper, Goldenberry, Prickly Pear, Tomato, Strawberry and Sweet Potato.

Bell Pepper and other hot peppers also originated in Meso and South America. Bell pepper is widely used in cooking in Latin America, and in Hondura and El Salvador, it is use in encurtido, a pickled vegetable side dish (Mangan 2017). Peppers (Fig. 27) are used in many dishes around the world including Europe and Asia. Its related cultivars, hot peppers, have been used medicinally, and to flavor many dishes. They are also dried to make paprika, a spice used in Louisiana Creole cooking ("Sweet Pepper").

Goldenberry is similar to the tomatillo as it has a papery sheath to protect the fruit (Fig. 28). However, this fruit can be eaten like other fruit as it is sweet and similar to a tomato. This food has been sold in South American markets and is medicinally significant due to its antioxidants. It originated in Brazil, but has naturalized in Peru and Chile ("Cape"). It is currently grown around the world in Africa and India.

Prickly Pear is widely known for its use in Latinx dishes and its cactus pads or paddles are usually referred to as "nopales." The culinary prickly pear paddles along with the fruit can be eaten more easily than other cultivars as it grows less prickly spines (Fig. 29). The indigenous people of Mesoamerica used

Fig 27: Bell Pepper, *Capsicum annuum*

Fig 28: Goldenberry, *Physalis peruviana*

Fig 29: Prickly Pear, *Opuntia ficus-indica*

Fig 30: Cherry Tomato, *Solanum lycopersicum var. cerasiforme*

Fig 31: Strawberry, *Fragaria × ananassa*

Fig 32: Sweet Potato, *Ipomoea batatas*

this plant for many things: spines for sewing needles and fruits and pads for food, dyes, and fermented beverages (Casey, 2010). The Aztecs used the plant to treat burns and stomach ailments ("Prickly").

Tomato was also an important plant to the Aztecs, despite its origin in the Andes, including countries of Peru, Chile, and Ecuador (Fig. 30). These indigenous peoples cultivated the plant and called it Xitomatl ("Garden Tomato").

The strawberry (Fig. 31) sold today is a cross between Chilean strawberry and European strawberry (Grubinger, 2012). Europeans created the hybrid plant and fruit we know today, but before the Spanish discovered the Chilean strawberry, Mapuche and Huilliche Indians of Chile had been cultivating the plant for years (Darrow, 1966).

Sweet Potato (Fig. 32) originated in Meso and South America, in Peru and Ecuador, but found its way to Polynesia, Asia long ago, before Columbus reached the Americas (Doucleff, 2013). Therefore, it is an important food in both Latinx and Asian culture, rooted in a long history of cultivation.

Asia

Plants from Asia include Basil, Bitter Melon, Cucumber, Carrot, Garlic, Ginger, Lemongrass, Lentils, Mustard Greens, and Onion.

Basil (Fig. 33) is important to many cultures such as Italian, Thai, Vietnamese, and Laotian. It is also a sacred herb in the Hindu religion and is only used sparingly in Indian dishes (Sullivan, 2009).

Bitter Melon is a staple in Southeastern cultures and one of the earliest accounts of the gourd was found in Thailand (Fig. 34). Bitter Melon is high in antioxidants and is antimicrobial. Therefore, the fruit and leaves have been used medicinally in India, China, Africa, and Latin America as the plant was distributed around the world (Behera, 2010).

Carrots (Fig. 35) originated in Afghanistan and have been found depicted in Egyptian temples. Greeks cultivated carrots and Romans ate carrots raw with oil, salt and vinegar or cooked with cumin and used them medicinally for venomous bites, ulcerations and for urinary infections (“Carrots”).

Cucumber (Fig. 36) originated in India and has been cultivated for thousands of years in Western Asia (Swaider, 1997). Chinese, Europeans, and even Native Americans have grown this plant in their gardens and it has become a common vegetable in many cultures.

Fig 33: Basil, *Ocimum basilicum*

Fig 34: Bitter Melon, *Momordica charantia*

Fig 35: Carrot, *Daucus carotus ssp. sativus*

Fig 36: Cucumber, *Cucumis sativus*

Fig 37: Garlic, *Allium sativum*

Fig 38: Ginger, *Zingiber officinale*

Fig 39: Lemongrass, *Cymbopogon citratus*

Fig 40: Lentils, *Lens culinaris*

Garlic originated in Central Asia, including current countries such as Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan (Fig. 37). However, this plant has historically been cultivated in Egypt, India, and China (Simon, 2016). In Egypt and Greece it has been used medicinally, taken to boost productivity, and found in Egyptian tombs. It is also used in Chinese medicine and Indian healing (Rivlin, 2001).

Ginger (Fig 38) is believed to have originated in India and has been cultivated in India and China for medicinal uses for thousands of years. The root is used as a spice in many dishes and was imported to Europe during the medieval times to make sweets. Ginger is present in many cultures in different forms, whether it is pickled, fresh, dried, crystallized, preserved, or ground (Bode, 2011).

Another aromatic plant, Lemongrass, is native to Southeast Asia and Africa (Fig. 39). The aromatic oil present in the plant provides scent for many cleaning/bath products and beverages and is especially important in India (“Lemon”).

Lentils (Fig. 40) originated around Southwest Asia and the Mediterranean. They are used in many Middle Eastern and Indian foods, and have become a staple to these cultures (Cokkizgin, 2013). Lentils are considered a superfood, like other legumes and beans because they are high in nutrients and protein.

Fig 41: Mustard Greens, *Brassica juncea*

Mustard Greens (Fig. 41) originated in the Himalayas of India, were cultivated in China, and have made their way to into Southern US, Chinese, Japanese, and Indian cooking ("History and Use").

Fig 42: Onion, *Allium cepa 'sweet onion'*

Onion is another widespread food that originated in either Central Asia, or Pakistan and Iran (Fig. 42). This plant was especially significant in Egyptian culture and symbolized eternity. Onions have been depicted in artwork and found in Egyptian mummies possibly due to their antiseptic qualities ("History of Onions"). In addition to the Egyptian peoples, people in India, China, and Europe all have used the onion for its medicinal properties to aid digestion.

Fig 43: Marigold/Calendula, *Calendula officinalis*

Pot Marigold (Fig. 43) originated from Asia and Europe, prominent in Indian and European culture in religious rituals. These marigolds, also known as Calendula, have edible flowers and are can be used to dye foods yellow ("The Herb"). They are not to be confused with the french marigolds, also known as tagetes, which are native to the Americas but are not edible. These are used in celebrations like Day of the Dead in Latinx culture and Aztec rituals.

Fig 44: Aloe Vera, *Aloe barbadensis*

Fig 45: Cowpea, *Vigna unguicalata*

Fig 46: Okra, *Hibiscus esculentus*

AFRICA

Plants originating from Africa include Aloe Vera, Cowpea, Okra, Radish, and Watermelon. Aloe Vera originated in the Arab Peninsula and Sudan.

Aloe Vera (Fig. 44) has a strong history and cultural significance in Africa, where it was used medicinally by Egyptians, and as a natural deodorant by African hunters (Pasarić). This plant has become a part of a common household item for its medicinal ability to soothe burns, such as sun burns. It is also used to make beverages that are taken for digestion.

Cowpea (Fig. 45) originated in West Africa, and is grown in Europe, India, and the Americas. This plant is used for food as well as medicine, and is usually ground into a flour to use in various recipes ("Vigna," 2017). Eaten in combination with a cereal such as corn creates a meal full with enough nutrients and protein to replace meat. Cowpeas are essential to cultures in Southern US, South America, and Africa as they often rely on these beans to provide food for their families (Rose, 2010).

Okra (Fig. 46) is another originated in Africa, specifically Ethiopia and Sudan, and has become a staple in recipes in the Southern United States and is eaten in Egypt and India as well. The seeds of this plant are sometimes used as a coffee substitute and for cooking oil in the Mediterranean region (Anderson).

Radish (Fig. 47) originated in the Eastern Mediterranean region and was cultivated in Egypt, China, and Japan for thousands of years before reaching Britain. Many parts of the plant including young leaves, fruits, and tap root are eaten ("Raphanus").

The watermelon originated in Namibia and Botswana. The most common cultivars in Africa have either bitter fruit and edible seeds which can be roasted, made into pulp and used in soups, or fried or feed to cattle after its valuable oil is extracted, or are cooking melons that have flesh that is not sweet or bitter and are cooked with beans, cowpeas, millet, or maize. These fruits are also used as a purgative or diuretic to treat diarrhea and gonorrhoea (van der Vossen, 2005). The common cultivars in the United States are dessert watermelons that have sweet flesh and can be eaten raw (Fig 48).

Fig 47: Radish, *Raphanus sativus*

Fig 48: Watermelon, *Citrullus lanatus*

Fig 49: Borage, *Boragio officinalis*

Fig 50: Broccoli, *Brassica oleracea var. italica*

Fig 51: Cabbage, *Brassica oleracea*

EUROPE

Plants from Europe include Borage, Broccoli, Cabbage, Cilantro, Collards, Kale, Lavender, Oregano, Rosemary, and Pot Marigolds. Many of these plants are all bred from the same plant, Brassica oleracea, of the Mustard family. These are Broccoli, Cabbage, Collards, and Kale. These plants are not only from Europe but also Asia Minor, which includes Turkish and Arab ethnicities.

Borage (Fig. 49) was used by English herbalists for treatment of jaundice, fever, sore throat and snake bites, and its use as an expectorant, for prevention of inflammation, and reduction of blood pressure has been supported by modern clinical trials. Throughout Europe, the flowers of borage were used in soups and stews as an herb or in candies and its leaves were used on salads or added to sweetened drinks, vinegar or wine. (Kreisberg).

Broccoli (Fig. 50) was cultivated in Italy and was used in Greece for treating gynecological disorders, tetanus, gastric upset and skin infections. It has been introduced to other European countries and North America and is a main vegetable in these diets (Bauman, 2016).

Greeks and Romans used cabbage juice for eye salves, swollen glands, bruises, cramps, and headaches and the seed as a remedy for mushroom poisoning (Phillips, 1827). Ancient Egyptians ate cabbage (Fig. 51) as the first dish of their meal to reduce intoxication

from drinking wine and used cabbage juice with wine to remedy viper bites (Janick, 2012).

Cilantro, or coriander, was used in many cultures and documented in texts from India and Egypt and the Old Testament. The seeds were used in Chinese medicine as a digestive, carminative and stomachic and in Iranian medicine to treat anxiety and insomnia. The plant (Fig. 52) was cultivated in Greece and used the seeds and leaves in perfumes and for cooking (Bauman, 2015).

Collards (Fig. 53) are an important food in the African American communities in the Southern United States and have strong historical and cultural ties as they were used during the time of slavery in the United States, cooked with meat scraps such like ham hock and pig's feet. Collards are used in several African countries in sukuma wiki and in Brazil served fresh with meat in a dish called couve. Collards are also used for detoxification, inflammation, and to aid digestion ("Collard Greens").

Kale (Fig. 54) has been traditionally used in Germany, in a dish with pinkel sausage and mettwurst, the Netherlands, in a dish with smoked sausage, and in Ireland in a dish called colcannon with mashed potatoes popular during Halloween ("Kale"). It has become more common in the United States since the 1990s because of its high nutritional value ("TRANSCRIPT").

Fig 52: Cilantro/Coriander, *Coriandrum sativum*

Fig 53: Collards, *Brassica oleracea acephala*

Fig 54: Kale, *Brassica oleracea var. sabellica*

Fig 55: Lavender, *Lavenandula angustifolia*

Fig 56: Oregano, *Origanum vulgare*

Fig 57: Rosemary, *Rosmarinus officinalis*

Lavender (Fig. 55) was originally cultivated in England, used in gardens and as lawns in Ireland, used in soaps, lavender water, to scent clean linens, and deter moths and insects. Lavender was also used in Egypt for perfume and incense and by Greek and Romans for herbal baths ("Lavender," 2013). In China lavender is used in medicinal oil for all ailments, including aches, coughs, and soreness (McCoy, 1999).

The Greeks used Oregano (Fig. 56) to treat narcotic poisons, convulsions, and was also used as an antiseptic ("Marjoram"). Oregano was also used to crown newly weds and put on graves to give peace to the deceased in Greek culture. It was used in the Middle Ages for toothache, indigestion, and coughs and in China for fever, stomach issues, and itchy skin ("History of Oregano").

Rosemary (Fig. 57) has been used as a symbol of remembrance in ancient Egypt, laying a spring of rosemary across the coffin, in ancient Greece, where scholars wore wreaths of rosemary to help remember information during exams, and in England, where guests are given rosemary at weddings to remember the occasion. Rosemary was used in the Middle Ages to dispel evil spirits, nightmares, the black plague, and negativity and used medicinally for indigestion, joint and muscle pain, and headaches ("Rosemary").

SITE DESIGN

After studying the plants of different cultures and origins, my overarching goal was to create a multicultural space in which people from diverse cultures can learn from the plants and one another. To represent this in my design of the garden, I created a parti of overlapping cultural diasporas. This parti served to form the planter beds, pathways, and gathering spaces. Due to the unique shape of the planter beds, the raised beds would be difficult to form out of wood. Therefore, they are constructed from urbanite, otherwise known as the recycled concrete previously used somewhere else for urban construction. A trellis provides structure for vining plants to climb on and create an intriguing entrance way from the playground and black top. The northern entrance is formed by aromatic shrubs to create a living fence and a gate with a sign will invite visitors and community members into the garden space. Stepping stones laid out in the middle of the beds provide informal pathways for maintanence and harvesting of the crops. The organization of the plants as well as the reasoning for the design elements included in the site are explained in the following sections.

Fig 58: School Garden Site Design

Fig 59: Perspective of Main Garden Entrance

Fig 60: Perspective of Gathering Space, Outdoor Kitchen

PLANTING DESIGN

Cultural plants are organized into four different sections. At the northern end of the site, Elderberry and Oak trees create a space to acknowledge the native american heritage and history of the site. Around the edges of the garden is a buffer of sensory shrubs to create a threshold for the garden as well as represent the different cultures present in the garden. The third section is the planter beds in the middle of the site. The plants in each bed mimic the diasporas that the physical design of the garden was inspired by. At the edge of the beds only plants from of one origin are present. The plants towards the middle near the main pathway become intermixed and are from different places of origin. At the lower end of the site, plants are organized by place of origin: North America/California, Mesoamerica, South America, Asia, Europe, and Africa. This creates an exploratory space in which students can discuss plants based on their origin, rather than grouping plants by culture. These plants are significant and present in many cultures. Instead of dedicating them to one culture, the plant origin invites more discussion for students to share their experience and knowledge as to which cultures have used the plant.

Native American Heritage Area

Sensory Plantings

Cultural Diaspora Planter Beds

Plant Origin Raised Beds

Fig 61: Cultural Planting Organization

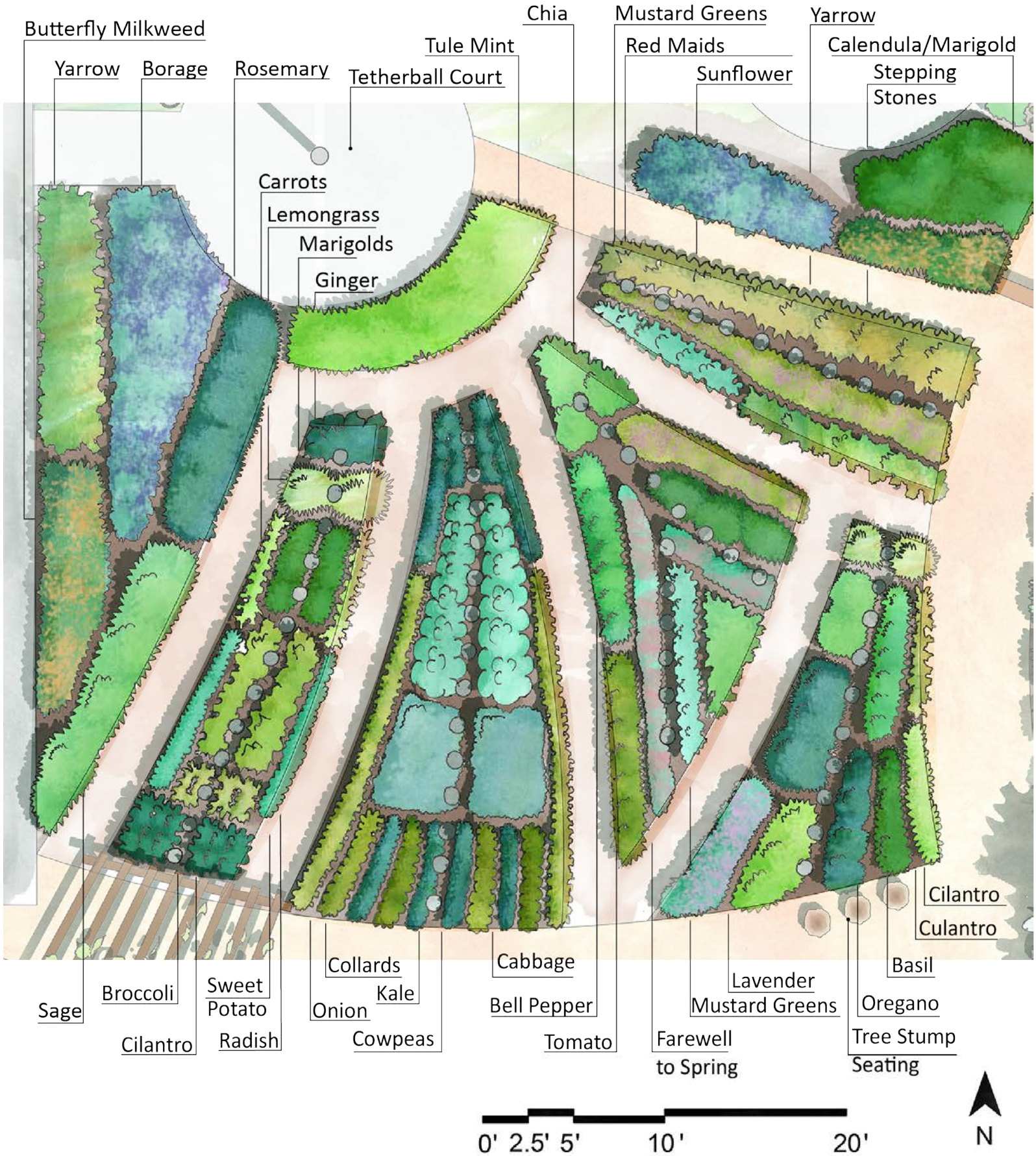

Fig 62: Northern Planter Beds

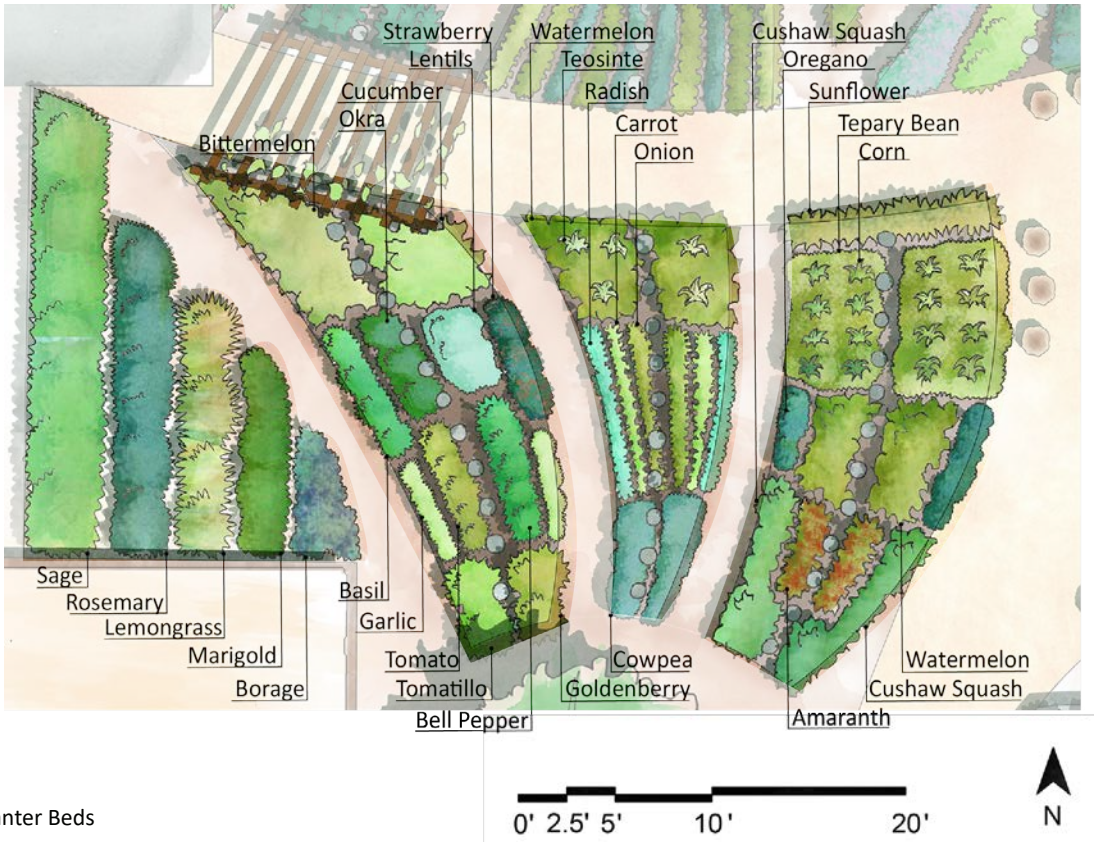

Fig 63: Middle Planter Beds

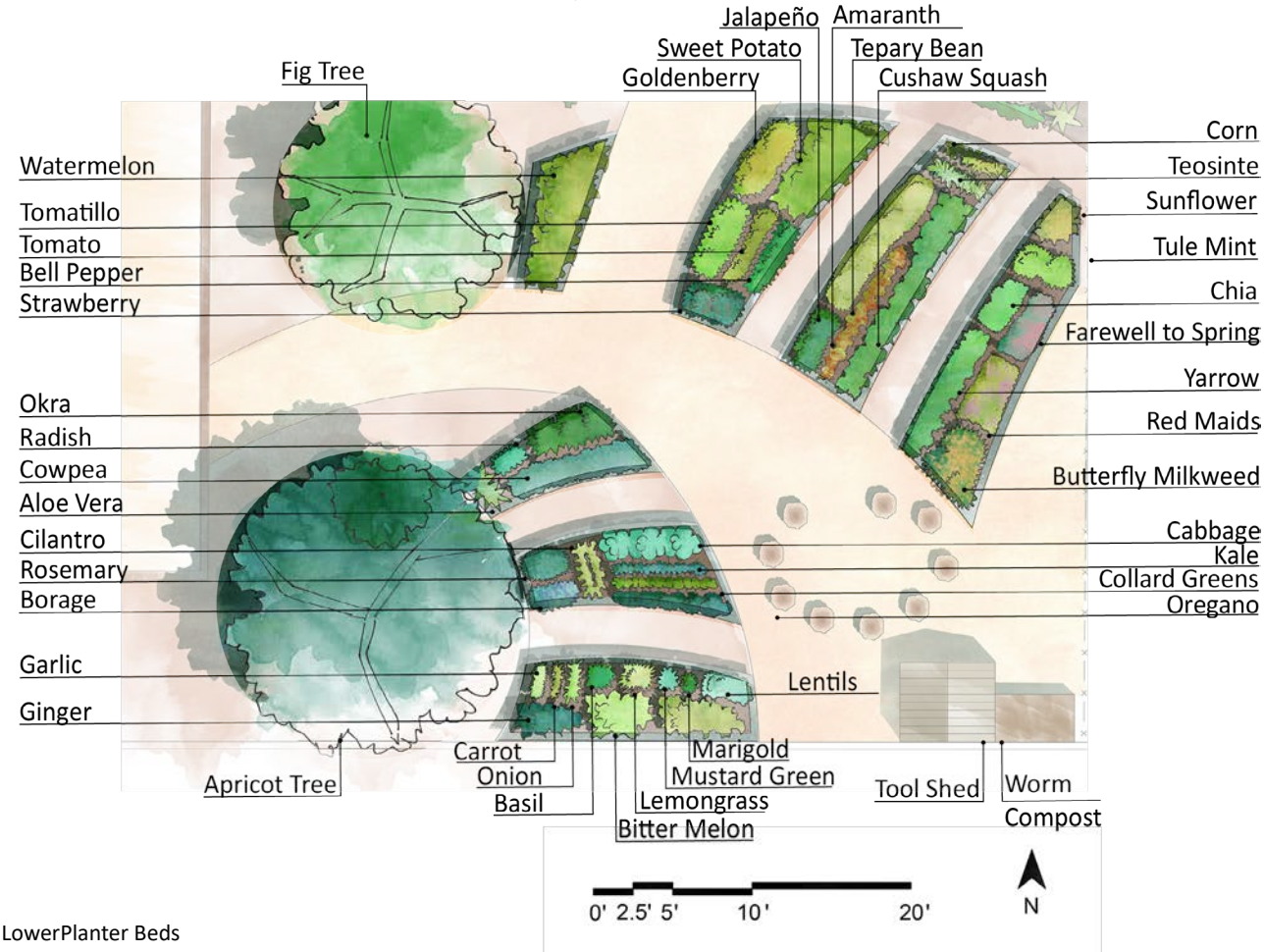

Fig 64: LowerPlanter Beds

DESIGN FOR CULTURAL LEARNING

While the plants are essential to the cultural learning garden, the design and activities that happen within the space are even more important. To achieve an inclusive and conducive space for cultural learning, I have designed physical spaces in addition to suggested activities and uses for the garden. These spaces correspond to the cultural learning spectrum stages of awareness, competency, humility, relevance, and specific.

To address **cultural awareness**, I have placed a commemorative sign and designated a space for the Patwin/Wintun Native Americans, who have a strong connection and history with the land that Woodland resides on. This pays respect to the historical stewards of the land and introduces young students to the Native American history in California using the landscape. In the planter beds, plants are organized to follow the diasporas; the outer edges of planter beds focus on one culture and as the cultural lines start to overlap, the plants mix with one another and are significant to many cultures. Companion plantings are used to successfully grow these plants together. This gradient of cultural plants creates an exploratory space in which students can interact with and learn which cultures correspond with each plant.

In the **cultural competency** stage of cultural learning, students and teachers explore and understand different cultures more in depth. An outdoor kitchen allows students and teachers to make recipes from diverse

AWARENESS

Fig. 65 :Cultural Plants

Fig. 66: Plant Signs

COMPETENCY

Fig. 67: Cultural Planter Beds

Fig. 68: Outdoor Kitchen

HUMILITY

Fig. 69: Gathering Area

Fig. 70: Sensory Plants

RELEVANCE

Fig. 71: Multilingual Signs

Fig. 72: Community Events

SPECIFIC

Fig. 73: Student Art

Fig. 74: Student Lead Projects

cultures using the plants grown in the garden and understand how plants are utilized for food, medicine, and materials. The planters at the southern end of the site provide a small sample of plants organized by origin for teachers and students to study the origin of the plants and significance to various cultures.

Programming for learning **cultural humility** takes the shape of gathering space both around the outdoor kitchen and the planter beds. The larger gathering space allows for larger community gatherings to take place and promote intercultural interactions, while the more intimate gathering space at the southern end of the site allows teachers to facilitate student discussions of culture. These spaces have moveable seating of tree stumps and benches to facilitate many different arrangements of gathering in the garden (Fig. #). Humility also involves recognizing different ways in which students learn. The garden itself is an alternative way of learning, providing a space for experiential, hands on learning. My design takes this further by using sensory plants such as butterfly milkweed, lemongrass, and marigolds to incorporate the different senses of sight, smell, touch, sound and taste. Butterfly milkweed and other pollinator plants attract pollinators such as hummingbird, bees, and butterflies to engage sight and sound. Lemongrass is an aromatic edible plant, engaging touch, smell, and taste, while marigolds have brightly colored edible flowers and engage sight, touch, and taste.

To provide a basis for learning **cultural relevance**, the garden includes multilingual signs such as the example shown in Figure #. These signs read in English as well as Spanish, Punjabi, Hindu, and Urdu, the four current languages other than English spoken at the school ("Rhoda Maxwell"). This places these cultures in the garden and creates an inclusive space for students who are English language learners. These signs could also help students practice their English and create discussion among students. Another culturally relevant practice includes hosting community gatherings for cultural holidays and fundraisers at the school. This would create a space in which the cultures present within the Woodland community could share their culture and learn about other's cultures.

To address the fifth stage of cultural learning: **culturally specific**, the garden will be utilized to showcase student works and projects. In this stage, it is critical for teachers and many students to become allies and support their students or peers in their cultural representation and voice. In collaboration with the local art workshop, Taller Arte del Nuevo Amanecer (TANA), students can create culturally inspired artwork, especially centered around current issues in the Latinx community. This will expose students to the equity activism present in the Woodland community and connect them to the greater Woodland area and its organizations. Students can also incorporate other plants that are significant to their culture to create ownership of the teaching garden space.

Fig 75: Cultural Learning in the Garden

CONCLUSION

Currently, there is a lack of cultural representation in school gardens that, if addressed, has the potential to create more culturally knowledgeable and inclusive communities. Through this process of creating a culturally focused garden, I realized that the garden itself cannot teach the different stages of the learning spectrum, but provide a space and structure that educators, students, and the communuity can utilize to explore other cultures and learn from one another in the garden. My garden design for Maxwell Elementary School provides an example that includes many cultures and elements for cultural learning that can be applicable to many other schools, even those without a strong population of many diverse groups of students. Landscape and teaching gardens can and should be utilized for cultural learning in education to increase empathy and equity among youth to create a more equitable future.

APPENDIX

Scientific Name	Common Name	Origin	Companion Plants	ENEMIES	Habit	Size
Achillea millefolium	Yarrow	California	repel aphids, attract hoverflies, lady beetles, wasps		herb	3 ft tall, wide
Allium cepa 'sweet onion'	Onion	A- Central Asia	Beets, Cabbage, Carrots, Celery, Chamomile, Cucumbers, Leeks, Lettuce, Pepper, Rosemary, Squash, Strawberries, Tomato	Beans, Peas, Sage, asparagus		1.5'x0.5'
Allium sativum	Garlic	A- Central Asia	Roses, Tomatoes, Brassicas, celery, lettuce, potatoes, strawberries	Aromatic Herbs, Beans, Peas, Potatoes	herb	1.5'x1'
Aloe barbadensis	Aloe Vera	F- Arab Peninsula, Sudan	borage, scented geraniums, the onion family, sow thistle, balm of Gilead, elderberry.		succulent	3 ft tall
Amaranthus cruentus	Amaranth	CA- Mexica, yucatan peninsula	corn (a shades c), eggplant,		herb	4'x2'
Asclepias tuberosa	Butterfly Milkweed	NA- North America			herb	2.5'x1.5'
Boragio officinalis	Borage	E-Mediterranean	all plants, esp cabbage, tomato, strawberries; squash,		herb	3'x2'
			melons, cucumbers for pollination			
Brassica juncea	Mustard Greens	A-India	Beets, Bush Beans, Celery, Chamomile, Cucumber, Dill, Garlic, Geranium, Hyssop, Marigolds, Mint, Nasturtiums, Onions, Potatoes, Rosemary, Rue, potato, Sage, Tansy, Thyme, oregano		herb	
Brassica oleracea	Cabbage	E- Central and South Europe	Beets, Bush Beans, Celery, Chamomile, Cucumber, Dill, Garlic, Geranium, Hyssop, Marigolds, Mint, Nasturtiums, Onions, Potatoes, Rosemary, Rue, potato, Sage, Tansy, Thyme, oregano	Grapes, Mexican marigolds, Pole Beans, Rue, Strawberries, Tomato, mustards	herb	2'x2'
Brassica oleracea acephala	Collards	E- Europe and Asia Minor	Beets, Bush Beans, Celery, Chamomile, Cucumber, Dill, Garlic, Geranium, Hyssop, Marigolds, Mint,	Grapes, Mexican marigolds, Pole Beans, Rue, Strawberries, Tomato, mustards	herb	2'x2'

			Nasturtiums, Onions, Potatoes, Rosemary, Rue, potato, Sage, Tansy, Thyme, oregano			
Brassica oleracea var. italica	Broccoli	E-A- Europe and Asia Minor	lettuce, spinach, radish, cucumber: Beets, Bush Beans, Celery, Chamomile, Cucumber, Dill, Garlic, Geranium, Hyssop, Marigolds, Mint, Nasturtiums, Onions, Potatoes, Rosemary, Rue, Sage, Tansy, Thyme.	Grapes, Mexican marigolds, Pole Beans, Rue, Strawberries, Tomato, mustards	herb	1'x3'-4'
Brassica oleracea var. sabellica	Kale	E- Southern Europe	Beets, Bush Beans, Celery, Chamomile, Cucumber, Dill, Garlic, Geranium, Hyssop, Marigolds, Mint, Nasturtiums, Onions, Potatoes, Rosemary, Rue, potato, Sage, Tansy, Thyme, oregano	Grapes, Mexican marigolds, Pole Beans, Rue, Strawberries, Tomato, mustards	herb	1.3'x1.3'
Calendula officinalis	Marigold	A- E- F Southwestern	basil, cucumbers,	beans, cabbage	herb	2'x2'

		Asia, Western Europe, Mediterranean	eggplant, gourds, kale, potatoes, squash and tomatoes			
Caliandrinia ciliata	Red maids	California			herb	1.3 ft max
Capsicum annuum	Bell Peppers	CSA- Central/South America	(peppers) Asparagus, Basil, Beets, Eggplant, Lettuce, Parsley, Rhubarb, Spinach, Tomato/(sweet peppers) Basil Okra	Fennel, beans, brassicas	herb	2'x2'
Capsicum annuum 'Jalapeño'	Jalapeño	CA-Mexico	(for pepper) Asparagus, Basil, Beets, Eggplant, Lettuce, Parsley, Rhubarb, Spinach, Tomato (chili pepper) lettuce, squash, cucumber.	Fennel	herb	3'x4'
Citrullus lanatus	Watermelon	F- South Africa, Egypt	Potatoes mulched with straw* citrus trees, corn, pumpkin.	*generally melons do not like potatoes	vine	1.6x6 ft
Clarkia ameona	Farewell to Spring	California			herb, edible seeds	1'-2 'tall
Coriandrum sativum	Cilantro	E- Southern Europe	Anise, carrots, radish, chard	Fennel	herb	2'x1.5'
Cucumis sativus	Cucumbers	A-India	Beans, Chamomile, Corn, Peas,	Aromatic Herbs – esp. sage, Potatoes	vine	1.5'x8'

			Carrot, Nasturtium, Radish, Sunflower, Cabbage, okra			
Curcurbita agyrosperma	Cushaw Pumpkin	CA- Central America	Corn, Radish	Potato	vine, climber	1.5'x15'
Cymbopogon citratus	Lemongrass	A- South Asia, Malaysia	mint, lavendar, sage, basil, thyme, cilantro, lemon verbena, echinacea, marigolds	cabbage(marigolds tend to attract spider mites and slugs)	herb	4'x3'
Daucus carotus ssp. sativus	Carrot	E-A-Afghanistan	Chives, Flax, Leeks, Leaf Lettuce, Onions, Parsley, Peas, Radish, Rosemary, Sage, Tomato	Dill, Anise	herb	1'x2'
Fragaria × ananassa	Strawberry	SA-NA Chile and North American cross	Borage, Bush Beans, Lettuce, Onion, Spinach, garlic, peas, thyme	Cabbage and brassica family members, kohlrabi, fennel	herb	1.5' x 2'
Helianthus californicus	Sunflowers	California N-North America	Corn, Cucumber	Pole Bean, Potato	herb	1.5'
Hibiscus esculentus	Okra	F- East Africa	Melons, cucumbers, sweet peppers, eggplant		herbaceous	3'-5'x5'
Ipomoea batatas	Sweet Potato	SCA_Central and South America	root vegetables, herbs,White Hellebore		vine	1'x9' vine
Lasthenia californica	Goldfields	California			herb	1.3'x.5' max
Lavenandula angustifolia	Lavender	E-F-A- South Asia,	Broccoli and cabbage		herb	1.5'x1.5'

		Mediterranean	family, garlic, strawberry			
Lens culinaris	Lentils	F-Africa, Middle East	potatoes, cucumbers	onions, garlic	herb	2'
Mentha arvensis	Tule Mint	California	Cabbage, tomatoes, nettles	Chamomile, parsley	herb	2.6 tall max
Momordica charantia	Bitter Melon	A_ India	Beans, corn, peas, pumpkins, and squash	potatos and herbs	vine	
Ocimum basilicum	Basil	A-India	Bell Pepper, Carrots, Marigold, Parsley, Tomato	Rue	herb	2'x2'
Opuntia ficus-indica	Prickly Pear Culinary	SA- Cultivar of Sonoran Desert			succulent	15'x10'
Origanum vulgare	Oregano	E-Greece	all vegetables, esp brassicas, asparagus, basil		herb	3'x2'
Phaseolus acutifolius	Sonoran Gold Tepary Beans	CA-Sonoran desert			vine	2' dia, 2-3' tall
Physalis ixocarpa, philadelphica	Tomatillos (Purple, Green)	CA-Mexico	(for tomato) Asparagus, Basil, Borage, Carrots, Celery, Chives, Bell Pepper, Horehound, Mint, Monarda (Bee Balm), Nasturtium, Onion, Parsley	Corn, Dill, Kohlrabi, Potato, Fennel		3.5'x4'
Physalis peruviana	Goldenberry	SA_ Brazil-Peru Chile			herb	2-3 ft, 6 max height
Quercus douglassii	Blue Oak	California			tree	40'

Raphanus sativus	Radish	F-Egypt	Beans, Beets, Carrots, Corn, Cucumbers, Lettuce, Nasturtium, Squash, Spinach, Parsnips, tomato, peas,	Cabbage, Cauliflower, Brussels Sprouts, Broccoli, Hyssop, Kohlrabi, Turnips, Potato	herb	3'x2'
Rosmarinus officinalis	Rosemary	E-Mediterranean	Beans, Cabbage, Carrot, Sage	None noted	herb	4'x4'
Rubus ursinus	California Blackberry	California	Tansy	Raspberries	Vine shrub	6x6 max
Salvia columbariae	Chia	California			herb	1.6 ft tall max
Sambucus nigra ssp. caerula	Blue Elderberry	California			tree	30'
Solanum lycopersicum var. cerasiforme	Cherry Tomatoes	SA- South America, cultivated by Meso Natives	Asparagus, Basil, Borage, Carrots, Celery, Chives, Bell Pepper, Horehound, Mint, Monarda (Bee Balm), Nasturtium, Onion, Parsley, marigold, garlic, roses	Corn, Dill, Kohlrabi, Potato, Fennel	herb	1.5'x0.7'
Vigna unguicalata	Cowpea	F- West Africa	(for pea) Carrots, turnips, radish, cucumber, corn, beans, potatoes, aromatic herbs	Onions, garlic, gladiolus	herb	3' tall,
Zea mays indurata	Wade's Giant Indian Flint Corn	SA- South America	Amaranth, Beans, Cucumber, Geranium,	Tomatoes, celery	herb	1'x6'
			Marigolds (any), Melon, Peas, Pumpkin, Potatoes, Squash, Sunflower			
Zea mays sp parviglumis	Teosinte	CA- Mexico, Central America	(for corn) Amaranth, Beans, Cucumber, Geranium, Marigolds (any), Melon, Peas, Pumpkin, Potatoes, Squash, Sunflower	Tomatoes, celery	grass	9' tall
Zingiber officinale	Ginger	A-Southeastern Asia	Cilantro, lemongrass, chili peppers, kaffir lime, legumes: red clover peas beans (for N), fruit/nut tree (dappled light)		herb	2-4'x4'

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