

Growing the “Outdoor Classroom”

A Report on School Gardens in
Albuquerque Public Schools



Grant Middle School garden sign

February 2010

ACKNOWLEDGEMENTS:

The ***Growing Gardens Team*** thanks all of the dedicated APS staff that responded to the survey and told their stories in this report. It is our sincerest hope that this report helps support your work and promotes gardening within our schools.

This report could not have been written without the constant enthusiasm and generous contributions of the *Growing Gardens Team* members. The majority of these members worked on this project as volunteers, in their after-work time. Team members include:

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Thank you to Kristen Woodruff, UNM Dietetic Intern, who assisted with compiling garden and nutrition related academic research.

A special thank you to Daniel Lau, Bill Emerson National Hunger Fellow from the Congressional Hunger Center. Daniel did the majority of the data analysis and report writing and his contribution to this project is immeasurable, and deeply appreciated.

All pictures in this report are from APS gardens, except the "This is a school garden" picture, which was copied from <http://www.edibleschoolyard.org/photo-video>.

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I. EXECUTIVE SUMMARY

The Albuquerque Public Schools (APS) district wellness policy covers many aspects of student wellness that include nutrition, health education, physical activity, social-emotional well-being and family-community partnerships. In addition to nutrition, science and environmental awareness, school garden-based activities have the potential to improve student academic achievement through experiential learning and promote overall student well-being. Garden-based education provides a vehicle to help educators meet standards in a hands-on, positive learning environment.

In summer 2009 a group of dedicated APS school gardeners began to meet and share ideas. Shortly thereafter they formed the *Growing Gardens Team* (GGT). GGT members knew that APS school staff have, one by one, been planting their own gardens but no one knew how many gardens there were. The GGT identified the following goals: develop a directory of APS gardens, find out some basic information about existing and planned gardens, and determine the training/networking needs of the staff working in these gardens. As a result, one of the first steps the GGT took was to administer a district wide survey. Additionally, case studies were conducted to provide a more in-depth look at school gardening successes, barriers and potential strategies. This report is based on the results of 29 surveys and 4 case studies.

Survey and case study findings showed that APS has a significant number of school gardens in various stages of operation including 13 schools reporting they have a garden that is currently in use, 10 are in the dreaming stages (wanting a garden), 3 schools are revitalizing a garden that has been used in the past, 3 schools are in the planning stages.

The majority of school gardens are in elementary schools. Respondents indicate that school gardens provide an opportunity to engage a variety of staff, parents, volunteers and community agencies in the education of students. The staff facilitating the school garden express a desire for on-going networking and professional development opportunities, as well as district-level support for school gardening. The respondent's experiences and interests provide a guide for the future of school gardens in APS.

Recommendations

The APS wellness policy procedural directive aims to promote the physical, emotional and mental health of students and staff. School gardens provide an opportunity for students to learn and practice skills in an outdoor classroom setting. Based on the findings, the following recommendations are made:

Networking and training

- Create professional development and networking opportunities for teachers that help them institute successful, sustained and high-quality gardening programs.

Needed Resources

- Seek funding for school gardens, both existing and planned, through state, local or grant funds. Move away from teacher funded gardens.

- Develop NM specific curricular materials to support teachers in integrating school gardening into standards based teaching.

District level

- Develop a district wide school gardening plan that includes short and long term goals.
- Produce an “APS Gardening Handbook” that clearly outlines district gardening resources, garden planning tools, linkages with education standards and benchmarks, contacts within M & O, safety guidelines, food handling guidelines, food sampling guidelines, and other essential information.
- Institute a centralized and organized district-wide school gardening program to support the development of school gardens/ outdoor classrooms and the professional development of staff working in these gardens.
- Develop an institutional mechanism for school gardens to easily apply for and access grant funds.
- Develop contact person(s) at APS Maintenance & Operations (APS M & O) to serve as the central point person for facility related gardening questions, including water access. Develop a commitment at M & O to supporting school gardening infrastructure needs.
- Develop contact person(s) at APS Food Service to serve as the central point person for school- food related gardening questions. Develop a commitment at Food Services to support school gardening.
- Investigate the feasibility of increasing school gardening programming into the middle and high schools.

“Working in the garden taught me to work with other people and to have patience as we watch things grow.” –7th grade female student, APS



Grant Middle School- youth planting, chard growing on left

II. INTRODUCTION

All across America schools and communities are returning to the proud tradition of growing gardens. Gardening in America is not a new phenomenon. For example in 1943 there were 20 million “Victory Gardens” planted in America-- at homes, schools, jails, and public buildings -- which produced nearly a third of all vegetables produced that year (www.revivevictorygarden.com). We have done it before and we are doing it again.

Why gardening? Why now? Why in schools?

A garden is more than just planting seeds and growing food. According to the National Gardening Association, across America school gardens are being used “as a vehicle for encouraging children to make good food choices, augmenting classroom studies with experiential learning, building a love of nature, stimulating social interaction, facilitating cultural exchange, and more.” (www.kidsgardening.com)



Gardens are also the ideal outdoor classroom. As an outdoor classroom they allow a place to implement effective teaching strategies such as hands-on and experiential learning. They also provide a place to teach and learn a wide range of academic subjects including:

- Literacy
- Math
- Botany
- Biology
- Environmental science
- English and creative writing
- History
- Health and nutrition

According to the National Gardening Association the number of households with gardens rose from 36 million in 2008 to 43 million in 2009, an increase of 19 percent.
National Gardening Association, Impact of Home and Community Gardening in America Report, 2009

In addition to academic subjects gardens are an ideal place to teach important social and life skills including:

- Cooperation, teamwork, sharing
- Caring for something other than self, nurturance
- Goal setting
- Safety
- Managing disappointment, frustration
- Enjoying success, with community

Gardens can also be used by school social workers, counselors, occupational therapists and others to reinforce the important social development milestones of childhood.

Research

We know that children's nutritional status and school attachment affect their school performance. Two out of three studies focusing on under-nutrition in US school children found significantly poorer cognitive functioning, decreased school attendance, and diminished academic achievement. Children with iron deficiency and anemia exhibited problems in cognitive or academic performance (Taras H, 2005).

School gardens have the potential to promote bonding between students. Teachers have reported their students often refer to school gardens as "our garden" and these gardens are often a place for students to take refuge and socialize during school hours. Studies have shown that adolescents who report feeling connected to their schools show lower levels of emotional distress, risk behavior, and aggression (Resnick, 1997). In addition, children who participate in programs that increase a child's ability to bond to their school show decreases in substance use, delinquent behavior, academic problems, and sexual activity (Hawkins, 2001).

In addition to nutrition, science learning, and environmental awareness, there are observations of school gardens promoting student's achievement, motivation to learn, psychosocial development, behavioral engagement, and cooperation with peers.
(Pranis, E. 2004)

Gardening can be one part of the solution to these challenges. The following summarizes gardening related research:

Academic achievement

- 3rd, 4th and 5th graders that participated in school gardening activities **scored significantly higher on science achievement tests** compared to students who did not participate (Waliczek 2005).

Social skills/ self esteem

- **Self esteem** in gardening classrooms increased in year one and remained high the next two years (NGA, school gardens measure up web page).
- School gardens incorporate group learning, allowing children to use skills that are not always appreciated in the regular classroom, like physical strength, visual-spatial skills, and building experience. Garden teachers have often commented that **students who struggle in the classroom tend to shine in the garden setting**. Several studies have shown that group learning has been associated with better peer relationships and higher academic achievement in the classroom (Marr, 1997; Moskowitz, 1983; Slavin, 1995).

Environmental awareness

- Gardening classroom students scored significantly better than those in control classrooms on measures of **appreciation for the environment and concern about human impact** (NGA, school gardens measure up web page).

Nutritional habits

- Involvement in school garden programs caused students to **eat more fruits and vegetables**, which increased their intake of vitamins and fiber. **Students more than doubled their intake of fruits and vegetables -- going from 1.93 to 4.5 servings per day** (McAlessee, 2007).
- Students who participated in nutrition education that incorporated school gardening were **more likely to choose and consume vegetables at school lunch** (Parmer, 2009).

Children with special needs

- Children with learning disabilities had **enhanced nonverbal communication skills, developed awareness of the advantages of order, learned how to participate in a cooperative effort, and formed relationships with adults** (1985, Sarver).

Student Wellness

America is experiencing a health crisis of epidemic proportions as the number of overweight youth rises, increasing risk for health consequences such as Type 2 diabetes. An **APS Student Healthy Weight Assessment Project** done in school year 09-10 found that:

- 33% of students in grades K, 3, 5 and 8 are classified as either overweight or obese (above the 85th percentile).
- The proportion of overweight and obese students increases with age.
- Hispanic, African American and Native American children are more likely to be overweight or obese than Asian American or Non-Hispanic White children.
- The elementary schools with the highest proportion of overweight or obese children tend to cluster in poorer areas of the county or in areas where there are higher proportions of minority children.

Hunger and food insufficiency in children are associated with poor behavioral and academic functioning.

-From the CDC Healthy Youth Fact Sheet

<http://www.cdc.gov/HealthyYouth/nutrition/facts.htm>

Eating more fruits and vegetables and being physically active are two evidence-based strategies proven to help kids and families maintain weight and improve overall health. Unfortunately, children aren't meeting the recommended amount of fruits and vegetables, which is about 3 ½ - 5 cups a day. Students from low-income families are particularly at risk of inadequate intake. School gardens provide an opportunity to learn about where food comes from and how fruits and vegetables are grown. Since kids are more likely to eat what they help grow and prepare, school garden-based activities can help boost fruit and vegetable intake.

Additionally, gardening-based learning in an outdoor classroom combats the hours kids spend sitting in front of a television or computer screen. Providing opportunities for kids to learn from nature is more important than ever. It's estimated that only 6% of children (9-13 years) play

outside on their own in a typical week (Children and Nature 2008: A Report on the Movement to Reconnect Children to the Natural World).

The Growing Gardens Team

As a vibrant, trend-setting school district APS schools have, one by one, been planting their own gardens. In summer 2009 a group of APS gardeners and garden supporters began to meet to support one another in our passion for school gardens. The team named themselves the *Growing Gardens Team* (GGT) and established the following goals for the 2009-2010 school year:

- 1) conduct a survey of all existing APS gardens, as well as those in the “planning” or “dreaming” stage to establish what they are doing and their future needs
- 2) publish results of the survey in a report and make recommendations for next steps
- 3) follow-up on the survey with professional development and networking opportunities for APS gardeners

The *Growing Gardens Team* meets monthly. The work of the GGT is entirely volunteer- based, with the exception of Jennie McCary, APS Wellness Manager and Susan Smith, APS Title I Resource Teacher.

Growing Gardens Team Workshops

Based on the survey results the GGT has already held two events at APS school gardens during after-school hours. In November 2009 a “Gardening Open House” was held at the Grant Middle School Behavior Intervention Program (BIP) garden. Attendees toured the garden and discussed, as a group, their gardening experiences and needs. Eighteen people attended. In January 2010 a “Garden Tour and Make a Worm Bin Workshop” was held at Bandelier Elementary School, with 27 people in attendance. The majority of people in attendance were APS teachers, nurses, administrators and support staff. Additionally, a series of after-school professional development workshops are planned for spring 2010, including a compost workshop and a curriculum share fair.



APS student picking a tomato

III. SUMMARY OF FINDINGS

Findings are based on:

- 1) District-wide gardening survey (29 respondents)
- 2) 4 case study interviews and school garden tours
- 3) Feedback received at 2 professional development workshops held for APS school gardeners in November 2009 and January 2010

APS has gardens

- APS has a significant number of school gardens. All of which were founded independently, with no central body supporting them. Of the 29 identified,
 - 13 (44.8%) are currently being used
 - 10 (34.5%) are in the dreaming stage
 - 3 (10.3%) have been used in the past and are now being revitalized
 - 3 (10.3 %) are in the planning stages
- The school gardens are primarily in elementary schools.

Use of gardens

- The school gardens are being used as live, experiential outdoor classrooms and a place for on-campus field trips.
- The primary uses of the school gardens are for growing vegetables, flowers, and herbs; quiet/ timeout space, nutrition/ hunger awareness, community services, art, composting and many other curriculum related activities (see Appendix B1).

Student and community involvement

- School gardens provide an excellent *place* to engage a variety of staff, parents, volunteers and community agencies in the education of students.
- Having a school garden has the potential to impact the entire school population. In SY 08-09 an average of 82 students at each school spent time in the garden and in 09-10 the average is estimated at 189 in each school.

Needs

- The school gardens sustain themselves on an average of \$1,000 per year, with budgets ranging from \$0 to \$6,000 for the school year. 34.5% are funded partially through staff out-of- pocket funds.
- The staff facilitating the school gardens express a desire for on-going networking and professional development opportunities and district level support for gardening.
- Specific areas of need are: maintenance and grounds keeping, tool banks, curriculum, web resources, and funding and grant information and assistance.

IV. SURVEY METHODOLOGY

One of the first tasks of the *Growing Gardens Team* (GGT) was to develop a directory of APS gardens, find out some basic information about existing and planned gardens, and determine the training/ networking needs of the staff working in these gardens. This first step was important because the team had no idea how many school gardens there were in APS or what the needs of this gardening community were.

The GGT used their collective gardening and survey design experience to develop a 20-question survey questions using Survey Monkey, an online survey and data collection system. The survey link was emailed out on September 25, 2009 via Jennie McCary, APS Wellness Manager, to school wellness leads, nurses, counselors, social workers and head special education teachers. After the October 7th deadline, results were reviewed and known gardens who did not respond were emailed or called and invited to respond. **Please refer to Appendix A for a copy of the school garden survey.**

The team had the good luck to be connected with Daniel Lau, MPH, a Bill Emerson National Hunger Fellow from the Congressional Hunger Center, working with the New Mexico Community Foundation on a temporary assignment. Daniel agreed to analyze results and author a report based on the results. Survey data was aggregated and simplified by Daniel. Pie charts, bar graphs, or grouping of short answers were the methods of data analysis and visual representation.



East San Jose Elementary School students moving soil

SPOT LIGHT:

At *East San Jose Elementary* in Albuquerque, Lisa Silva reports "a discussion [in 1999] planted the seed for the idea to create a true community garden. In addition to inviting all ESJ students and families, they reached out to senior citizens of the neighborhood as well to participate. A local men's group also offered to share their hearts and hands in the project too. David Witherspoon, an architect and member of the men's group, continued to work with the students and community for 10 years and was instrumental in the program's success. The goals of incorporating literacy, math science and social skills hold true today as Principal Tognoni encourages the ESJ faculty to participate in the program. We are also reaching out to the parents and local community to participate in the new and revived school garden areas."

V. SURVEY RESULTS

A. Survey Participants

A total of **29 schools** within Albuquerque Public Schools (APS) filled out the school garden survey (Table 1) by the due date. The schools are in various stages of school gardening: current, current/ revitalizing, planning, or dreaming.

Table 1: APS school gardens school name, phone number, and stage of garden

School Name	School phone number	Garden Stage
Atrisco Elementary	(505) 877-2772	Current
Bandelier Elementary	(505) 255-8744	Current
Cochiti Elementary	(505) 345-1432	Current
East San Jose Elementary	(505) 764-2005	Current/ being revitalized
Inez Elementary	(505) 299-9010	Current
Los Padillas Elementary	(505) 877-0108	Current/ being revitalized
Marie Hughes Elementary	(505) 897-3080	Current
Monte Vista Elementary	(505) 268-3520	Current
Onate Elementary	(505) 291-6819	Current
Petroglyph Elementary	(505) 898-0923	Current
Zia Elementary	(505) 255-7451	Current
Grant Middle	(505) 299-2113	Current
McKinley Middle	(505) 999-0737	Current
Native American Community Academy	(505) 266-0992	Current
Freedom High	(505) 999-0737	Current
Highland High	(505) 999-0737	Current/ being revitalized
San Antonito Elementary	(505) 281-3931	Planning
Tierra Antigua Elementary	(505) 792-3262	Planning
John Adams Middle	(505) 831-0400	Planning
Alameda Elementary	(505) 898-0070	Dreaming
Griegos Elementary	(505) 345-3661	Dreaming
Hawthorne Elementary	(505) 999-0737	Dreaming
Marie Hughes Elementary	(505) 897-3080	Dreaming
Pajarito Elementary	(505) 877-9718	Dreaming
Rudolfo Anaya Elementary	(505) 452-3137	Dreaming
Sierra Vista Elementary	(505) 898-0272	Dreaming
Susie Rayos Marmon Elementary	(505) 831-5400	Dreaming
Valle Vista Elementary	(505) 836-7739	Dreaming
Garfield Middle	(505) 344-1647	Dreaming

Refer to Figure 1 for more information. Since the survey analysis was completed a new survey response was received from **Coronado Elementary School** who reports their garden “Has been used in the past and is now being revitalized.” This information is not represented in the above chart or results section.

If your school has a garden or is planning a garden and you do not find your school listed it is because we did not receive a response from your school. **If you want to be added to the APS garden list email** Jennie McCary at mccary@aps.edu

B. Current Garden Usage

Figure 1: Garden stage of development

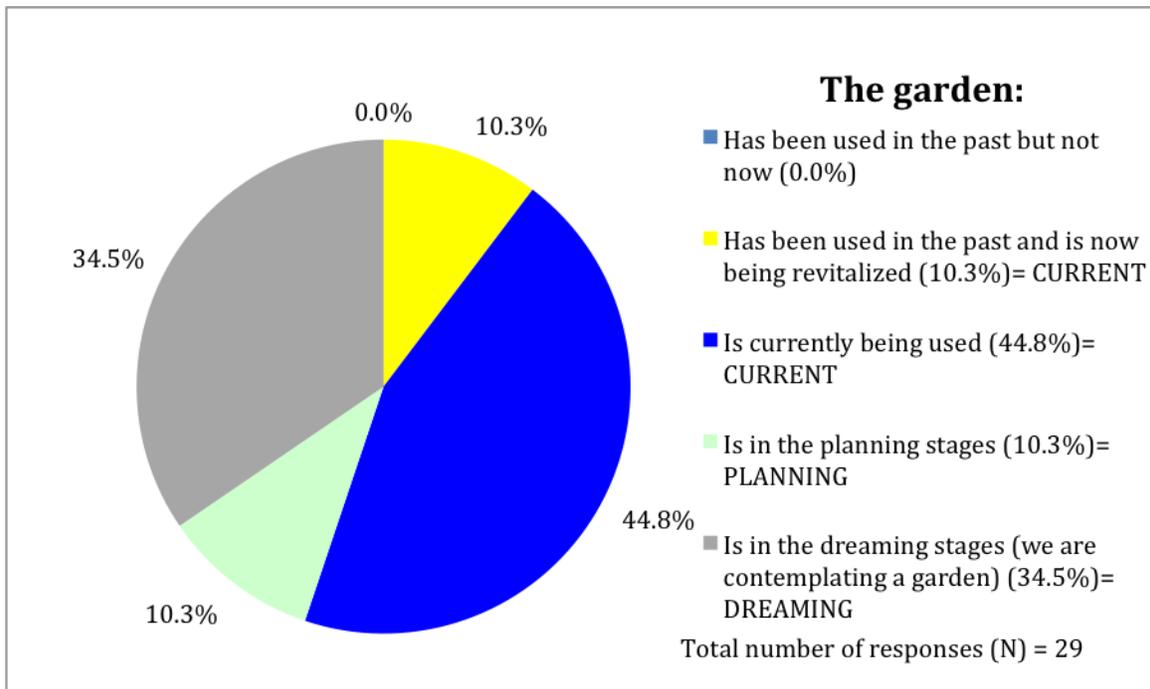


Figure 1 shows the different stages of garden development and the percentages of schools in those stages. **Thirteen schools (44.8% of survey respondents) have a school garden that is currently being used in school programs.** Three schools (10.3%) are currently revitalizing their school garden that has been used in the past. Another 3 schools (10.3%) are in the planning stages, and 10 (34.5%) are in the dreaming stages.

C. School-Year Garden Involvement

This section of the survey analysis presents the types and numbers of people helping in the garden, specific grade level involvement, and what students do in the garden during the school year.

The survey results revealed that **many types of people help in the garden.** With a total of 29 respondents, 24 (82.8%) responded that students help in the garden, 23 (79.3%) responded that teachers help in the garden, 14 (48.3%) responded parents, 10 (34.5%) responded school staff, and 6 (20.7%) responded non-school staff volunteers. Keep in mind that only 44.8% of survey respondents have a garden currently being used.

Table 2: Number of each “garden helper type” during the school year (average and range)

Garden Helper Type	Number of Responses (N=29)	Average Number of Garden Helper Type	Numerical Range of Garden Helper Type
Students	19	133	10-600
Teachers	19	8	1-25
Parents	16	11	0-25
Non-school staff volunteers	13	5	0-20
School staff	11	5	0-25

Table 2 breaks down the numerical range and average number of each garden helper type. For example, from 19 out of 29 responses, *there was an average of 133 students and a range of 10-600 students helping in the garden during the school year.* Keep in mind that only 44.8% of survey respondents have a garden currently being used.

Teachers were the most frequently reported “garden helper” from school staff. Educational assistants, administrators (principal, counselor, and librarian) and custodians were also identified as a “garden helper” by respondents at a smaller number of schools (see Table 3).

Table 3: Type of school staff garden helpers

Type of School Staff Garden Helper	Number of Responses (N=29)
Teachers	24
Educational Assistants (EAs)	8
Administrators (principal, counselor, librarian)	6
Janitorial (custodian)	6
Support staff (YMCA)	2
Other	1
None	3

All respondents, regardless of their stage of garden operation, were asked to estimate the number of students who have spent or will spend time in the garden during 2008-09 and 2009-10 school years. From 2008-09 to 2009-10, there is an increase of approximately 100 average students (82 to 189) spending time in the garden. The numerical range remained similar, from 0-700 students in 2008-09 to 10-720 students in 2009-10 (see Table 4). *Responses indicate that student participation is expected to increase with each school year the garden is in operation.*

Table 4: Number of students who have spent/will spend time in the garden during 2008-2009 and 2009-2010 school years (average and range)

	Number of Responses (N=29)	Average Number of Students	Numerical Range of Students
SY 2008-2009	16	82	0-700
SY 2009-2010	22	189	10-720

Figure 2: Garden involvement by grade level

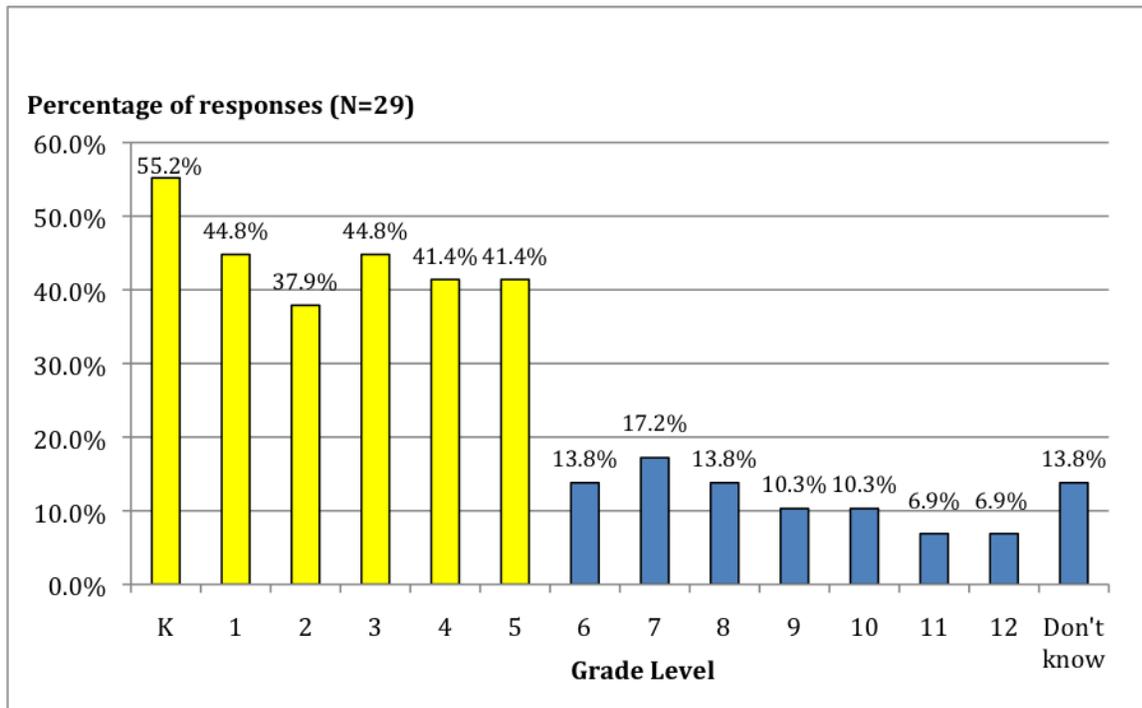


Figure 2 shows the percentage of responses to grade level involvement. *From schools who responded, grades K-5 are more involved in school gardens compared to grades 6-12.* There is a significant drop in percentage of grade level involvement after 5th grade. From elementary school to middle school, there is a drop in involvement from 41.4% (5th grade) to 13.8% (6th grade).

Table 5: Student garden activities

Student Garden Activity	Response Percent
Grow Vegetables	75.9%
Grow Flowers	51.7%
Quiet Space/Timeout Space	51.7%
Grow Herbs	48.3%
Raised Bed Gardening	44.8%
Nutrition/Hunger	41.4%
Community Service	37.9%
Garden Art	37.9%
Composting	37.9%
Butterflies	34.5%
Garden Themes (3 sisters, pizza or salad garden)	34.5%

Growing vegetables is the top student garden activity. Students also grow flowers, herbs, and use the garden for quiet/timeout space. Table 5 lists the top student garden activities. There were a total 29 garden activities to select from in the survey. **Refer to Appendix B2 for the full table with the complete list of garden activities and the response percentages.**

D. Summer Garden Involvement

This section of the survey analysis presents the types of people helping in the garden, and specific management strategies during the summer.

Maintaining the garden during summer months is a challenge and school staff have found creative ways to manage the garden during this growing season. The survey results revealed that ***all members of the school population help in the garden during the summer but compared to school year involvement, the percentages drop significantly.*** Fourteen schools (48.3%) responded that teachers help in the garden during the summer, and the same amount (48.3%) also responded that students help. Parents (27.6%) are also called on to help during the summer and to a lesser extent, school staff (24.1%) and non-school staff volunteers (13.8%). Several respondents noted that custodians and local community members harvest the produce over the summer.

Respondents reported creative and unique strategies for managing the school garden during the summer, including:

- Boy scouts
- YMCA summer program
- Family sign-ups where the water key is rotated
- Automatic watering systems
- Child summer camps
- Summer school students
- Youth Conservation Core student members
- Title 1 students

E. Funding

Table 6: Top 5 funding sources

Funding Source	Response Percent
Local Grants	34.5%
Private Donations from Parents/Community Members	34.5%
Staff Out-of-pocket	34.5%
School Funds	27.6%
PTA Funds	27.6%

Table 6 lists the top 5 funding sources for school gardens. One of the top funding sources is staff members paying out-of-pocket (34.5%, or 10 out of 29 schools). *A higher percentage of funds are coming from private donations and school staff as opposed to school or PTA funds. Please refer to Appendix B1 for the full table with the complete list of funding sources.*

Table 7: Average current and needed budgets

	Number of Responses (N=29)	Average Budget (\$) of Each Garden	Range of Budget (\$)
Current Garden Budget	12	\$1,129	\$0 – 6,000
Needed budget	15	\$1,610	\$150 – 6,000

Table 7 summarizes the current and needed budgets of respondents. *These results indicate there is there is a discrepancy between the current and needed budgets, and that a school garden can be operational on a wide range of budgets.*

Also of note is that a significant number of respondents did not answer with a numeric budget number; some respondents said: “as much as possible”, “don’t know yet” or “unknown.”

F. Professional Development

Table 8 lists the potential professional development activities for school gardeners by level of interest, from most interested to least interested. The highest ranking activities revolved around garden curricular materials, connecting with local partners, and funding. In general, *respondents expressed a high degree of interest in all proposed professional development topics.*

**Table 8: Rating average of interest in professional development activities
on a scale of 1-4, with 4 being “very interested”**

Answer Options	Rating Average	Response Count
Learning about garden related curricular materials	3.74	27
Learning about how to connect with local partners (farmers, county extension, master gardeners, etc.)	3.71	28
Learning about gardening funding ideas	3.64	28
Having someone help you with the garden (planning, labor, teaching, knowledge)	3.61	28
Networking with other school gardens and learning “tips” from them	3.59	27
Learning technical skills like soil amendment, winter gardening and raised bed gardening	3.46	28
Visiting other community gardens	3.43	28
Visiting other APS gardens	3.36	28
Ideas for using the food you grow in the school	3.36	28
Learning about tips for working with group dynamics and age appropriateness in the garden	3.32	28

VI. CASE STUDY METHODOLOGY

In addition to the surveys, the GGT decided to conduct case studies to highlight several schools in different stages of garden operation within APS. The case studies provided a more in-depth look at successes and barriers and insight into potential strategies and recommendations.

Each case study consisted of a 1-hour interview with the most knowledgeable school garden staff member and a tour of the current (or future) site of the school garden. The interview questions were developed through a collaborative process among the GGT. Daniel Lau, Emerson Hunger Fellow, agreed to be the case study researcher. A final interview guide was developed, touching on topics of logistics and sustainability of school gardening. **Please refer to Appendix A for a copy of the case study guide.**

As a team, the group decided to conduct 4 case studies. To achieve a diversity and variety in type of school, age of student population, and stage of development/implementation for the school garden, the following schools were chosen: Bandelier Elementary, Tierra Antigua Elementary, Grant Middle School Behavior Intervention Program (BIP), and Freedom High.

During the interview, Daniel kept hand-written notes. Following the interviews, he transcribed the notes and sent them back to each interviewee for review of consistency and accuracy. In addition, he asked the interviewees to share pictures and quotes/anecdotes of student learning and working in the garden, if available.

After all 4 interviews were returned and edited; Daniel presented the final interview transcripts to the GGT. A subset of the larger team met with him to identify emerging themes from the text, decided which themes to highlight and the format with which to present the results.



Bandelier Elementary School, parents helping build raised beds

SPOT LIGHT:

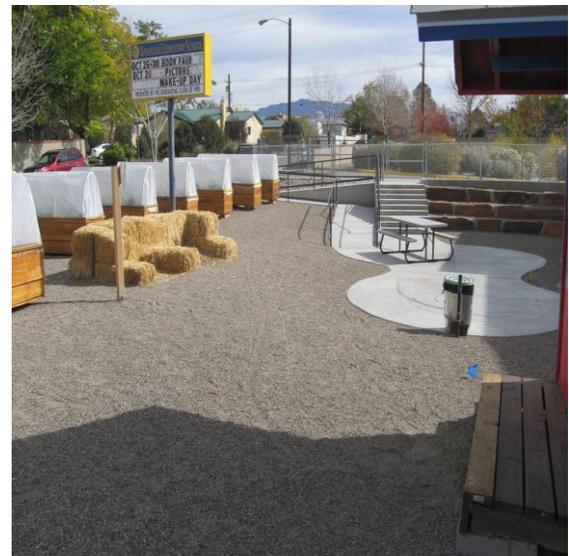
From **Zia Elementary School** Sara Van Note reports “The Zia Garden Club has existed for two years as an after-school program open to all students. We meet once a week for an hour and a half to work in the garden, play outside, and eat delicious, healthy food. Students learn about nutrition, physical activity, and gardening techniques through games, books, songs, and activities. The Garden Club has connected to the community through field trips to the Nob Hill Grower’s Market, the olla factory and greenhouses at East Central Ministries, and Plants of the Southwest. We strive to adapt our garden to the New Mexico environment, cultivating native foods and using organic materials.

VII. CASE STUDY RESULTS

A. School Garden Profiles

Bandelier Elementary School

Located in the Southeast Heights, Bandelier Elementary has an enrollment of 605 students, grades K-5. The Bandelier case study was conducted with Mary Erwin, a teacher with her Master's in Elementary Science Education. Mary and Principal Glenda Armstrong, who is also a gardener, were instrumental in the development and initiation of the garden. The school garden, named the Bandelier Garden & Outdoor Classroom, was started several years ago with a desire to start an outdoor education program and expand outdoor opportunities. The garden is in its 2nd year of existence; the 1st year was used for planning, and currently Bandelier is halfway through its 1st year of growing. The garden consists of 10 raised beds, each with dimensions of 2ft x 2ft x 8ft. The garden is located on the north edge of campus, which interfaces with the community. A variety of flowers, herbs and vegetables are grown in the garden, including chard, kale, carrots, lettuce, and radishes. PTA funds and \$50,000 in capitol outlay funds secured by Senator Cisco McSorley were used to start the garden and renovate the garden area, while PTA grants and fundraisers are currently sustaining the garden. Ten classrooms (200-250 students), 2 mothers, and several educational assistants (EAs) learn and work in the garden regularly. A student composting exclaimed: "This is dirt. I made dirt!" A parent volunteer, demonstrating similar enthusiasm, commented: "Wow, I had no idea how fun this was!"



Bandelier before and after. Notice “outdoor classroom” seating area. The structures that look like pioneer wagons are raised bed hoop houses. These allow a variety of vegetable and flowers to be grown in both summer and winter.

Tierra Antigua Elementary School

Tierra Antigua has a student enrollment of 528, grades K-5. Located in the Ventana Ranch neighborhood in the Northwest area of Albuquerque, Tierra Antigua is in its first school year of operation and the school garden is currently in the planning stages. The case study was conducted with Principal Jami Jacobson. The gardening space was part of the initial construction when the school was built in April 2009. The land Tierra Antigua was built on is rich with Native history, agriculture and culture. The school staff would like to use the school garden to teach these concepts and integrate them into the curriculum. The garden will be approximately 4 ft x 150-200 ft, located in the north playground area. Various vegetables, plants, and flowers are in the plans to be grown in the garden. Because the garden space was included in the initial plans, funds for construction were included in the budget from bond election money. Looking ahead, Tierra Antigua plans to seek future funding sources from grants and PTA support. Principal Jacobson would like to see at least 30 students learning and working the garden, partial sponsorship from parents, and 100% involvement from teachers and staff.



Tierra Antigua is in the “planning” stage and plans to grow vegetables in the terraced areas pictured above.

Grant Middle School – Behavior Intervention Program (BIP)- “Jean Garlie Garden”



Grant Middle School and the Behavior Intervention Program (BIP) have a total school enrollment of 761 students. Both Grant and BIP serve grades 6-8. In the Mesa Village neighborhood of Northeast Albuquerque, Grant’s school garden began in the 1998-1999 school year. The Jean Garlie Garden, as it is known, has passed through inconsistent management. The case study was conducted with BIP Social Worker Whitney Kane, who is the lead for the garden, and BIP Assistant Principal Patricia Williams. The garden serves to create a hands-on experience and creative outlet for youth. Measuring 3,959 square feet, the garden is close to the main entrance to the school. Twenty species of Native plants, sunflowers, garlic, kale, tomatoes, carrots, and a variety of other vegetables, fruits, and herbs are grown in the garden. To initiate the garden, various sources including BIP activity funds, Elev8 funds, donations, staff out-of-pocket money, and small grants were utilized. Currently, the same sources as well as the Albuquerque Community Foundation are sustaining the garden. The staff hopes that the BIP activity fund and continued YMCA and Elev8 support will support the garden in the future. Learning and working in the garden are 30 BIP students, 50 Grant students, 25 BIP staff, 5 Grant staff, and 8 YMCA staff. At Grant and BIP, the Jean Garlie Garden serves a unique role to students as a mental health calming activity. One student, who had been carrying compost was quoted: “This was the best day of my life.



Volunteers working in Grant Middle School Garden.

Freedom High School

Located Midtown, Freedom High School serves grades 9-12. The case study interview was conducted with Susan Smith, Title I Resource Teacher, who is also the lead for the school garden. The garden, whose name is still in development, began just several months ago in October 2009. Freedom High staff started the garden with support from Title I. The staff wants the garden to promote active engagement, civic service, and community and neighborhood involvement. Measuring at approximately 30ft x 4ft, the garden is next to the school. A variety of vegetables can be found in the garden: lettuce, chard, carrots, cabbage, and radishes. The garden was started through Title I money and donations from Botanical Interest and Home Depot. Title I money, as well as grants and donations, continue to fund the operations. For the future, the staff hopes to develop entrepreneurial projects, such as selling seeds and school garden kits, to sustain the garden. Currently, 45 students, 3 advisory teachers and 1 counselor learn and work in the garden.



Raised bed winter garden at Freedom High School. Garden border made from cement blocks.

B. Case Study Themes

Infrastructure

- **Each school expressed concerns regarding the infrastructure of their school garden.**
 - Environmental concerns (soil, wind, water) and/or human concerns (children in the playground, security from vandals) as issues affecting the construction and the sustainability of the garden.
 - Bandelier built raised beds on proposed garden land suffering from soil erosion and sitting on an incline.
 - Grant/BIP is currently using a water source not within the garden space and is seeking a water spigot to ease the maintenance of their garden.
 - Freedom's garden was purposefully built in a peripheral location to protect the garden from vandalism and windy environmental conditions.
 - Tierra Antigua, in the planning stages of its school garden, is concerned about protection because the proposed garden site is near the playground.
 - Tierra Antigua has also had problems with neighboring middle and high school students using their playground and recreation facilities during non-school hours.
 - Tierra Antigua staff are considering building a fence around the garden area for protection purposes.

Management/Ownership

- **Garden management during the school year and over the summer months are two of the most pressing issues.**
 - All four case study schools described a unique management method to care for the school garden year-round.
 - Bandelier, Grant/BIP, and Freedom have teachers, students, and/or extra-curricular clubs care for the garden during the school year.
 - Tierra Antigua hopes to have teachers, students, and/or extra-curricular clubs care for the garden when it gets started.
 - For summer, Bandelier has recruited 10-15 families to water the garden twice a week.
 - Grant/BIP hopes to have YMCA summer school programs and school staff volunteers.
 - Freedom integrated the Title I summer program staff and students to care for the garden.
 - Tierra Antigua expects that custodians, volunteers, teachers, and principals will continue gardening through the summer.
- **Each school noted the necessity of passing on ownership of the garden to students, parents, and community members for sustainability.**
 - Tierra Antigua, Freedom and Bandelier all expressed passing ownership of the garden to teachers, parents, and the wider community through mentorship and collaboration.
 - Freedom would like to establish a city-school relationship, using the space as both a school garden and a community garden.
 - Grant/BIP, with the longest-running garden among the case study schools, has had inconsistent leadership over the years has tried to foster ownership among the students through a mural painting.
 - On one of the walls of the Grant/BIP garden, students have created symbols, water cycle, and hot air balloon murals.

Barriers to school gardening

- **Three main confounding challenges, specific to teachers: lack of gardening expertise, perception of gardening as an extra task, and time.**
 - Teachers expressed a lack of garden subject matter expertise, felt unsure of themselves, and doubted their confidence level in the garden.
 - As a result, gardening is perceived as something extra and an add-on to their curriculum and lesson plans, requiring extra time to develop new lesson plans and to take their students out to the garden.
 - Time is the most substantial barrier due to increasingly hectic schedules, testing and academic performance indexes to meet each year.
 - Struggle to find time to think about gardening as a complement to their student's education.

District support

- **Many of the issues and concerns could be addressed by APS central administration.**
 - APS could function as a central information center, so schools in various stages of school garden development could get support.
 - Prefer district level support so that resources and information could be coordinated and shared throughout the entire district.
 - As stated by the interviewees specific areas of need are: maintenance and grounds keeping, tool banks, a curriculum library, website functions, funding/grant information and assistance, and increased funding for nutrition and science education.

Future plans

- **Each case study school has exciting plans for their garden.**
 - Bandelier, Freedom, and Grant/BIP would like to incorporate more food from the garden into a cooking component, to complete the food production and consumption cycle.
 - Tierra Antigua is setting up a mobile “cooking cart” for next school year, composed of utensils, a microwave, a food processor, and other kitchen appliances that can be borrowed by teachers to allow their students to cook in the classroom.
 - Some schools would like to see food grown in the garden served in the cafeteria, promoting local food for school lunches.
 - Many schools want gardening to become better integrated into curriculum
 - Tierra Antigua wants to see environmental concerns and green living incorporated into garden work.
 - Schools expressed a desire to establish school-community relationships around the garden as a vehicle to bring students, parents, teachers, and administrators together around a shared value: the enjoyment of food.

VIII. RECOMMENDATIONS

Based on the findings contained in this report the *Growing Gardens Team* makes the following recommendations:

Networking and training

- Create professional development and networking opportunities for teachers that help them institute successful, sustained and high-quality gardening programs.

Needed Resources

- Seek funding for school gardens, both existing and planned, through state, local or grant funds. Move away from teacher funded gardens.
- Develop NM specific curricular materials to support teachers in integrating school gardening into standards based teaching.

District level

- Develop a district wide school gardening plan that includes short and long term goals.
- Produce an “APS Gardening Handbook” that clearly outlines district gardening resources, garden planning tools, linkages with education standards and benchmarks, contacts within M & O, safety guidelines, food handling guidelines, food sampling guidelines, and other essential information.
- Institute a centralized and organized district-wide school gardening program to support the development of school gardens/ outdoor classrooms and the professional development of staff working in these gardens.
- Develop an institutional mechanism for school gardens to easily apply for and access grant funds.
- Develop contact person(s) at APS Maintenance & Operations (APS M & O) to serve as the central point person for facility related gardening questions, including water access. Develop a commitment at M & O to supporting school gardening infrastructure needs.
- Develop contact person(s) at APS Food Service to serve as the central point person for school- food related gardening questions. Develop a commitment at Food Services to support school gardening.
- Investigate the feasibility of increasing school gardening programming into the middle and high schools.



*Grant Middle School student-
about to turn a garden tomato into salsa*

“The Grant BIP garden is great because different people have put in their own ideas and it’s nice to see how it all comes together.”

–7th grade female student, APS

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X. APPENDICES

A. Appendix A: survey and case study questions

Survey questions

1. What school is the garden in?
2. The name of the main contact person for this garden is:
3. Phone number for the main garden contact person:
4. Email for the main garden contact person:
5. The garden:
 - Has been used in the past but not now
 - Has been used in the past and is now being revitalized
 - Is currently being used
 - Is in the planning stages
 - Is in the dreaming stages (we are contemplating a garden)
6. Who helps take care of the garden during the school year? (check all that apply)
 - Students
 - Parents
 - Teachers
 - Non school staff volunteers
 - School staff
 - Don't know
 - Not applicable
7. How many of each kind of helper helps during the school year?
 - Approximate number of Students
 - Approximate number of Parents
 - Approximate number of Teachers
 - Approximate number of Non school staff volunteers
 - Approximate number of School staff
 - Don't know
 - Not applicable
8. Describe the type of school staff that help in the garden (eg teachers, security, janitorial, administration etc) ?
9. Who helps take care of the garden in the summer? (check all that apply)
 - Students
 - Parents
 - Teachers
 - Non school staff volunteers
 - School staff
 - Don't know
 - Not applicable
10. How many of each kind of helper helps during the summer?
 - Approximate number of Students
 - Approximate number of Parents
 - Approximate number of Teachers
 - Approximate number of Non school staff volunteers

Approximate number of School staff

Don't know

Not applicable

11. Tell us more about how the garden is taken care of in the summer:
12. How many students spent time in the garden during the 2008-2009 school year?
13. How many students will spend time in the garden during the 2009-2010 school year (approximation okay)?
14. Which grade levels are involved in the garden(check all that apply):
K-12
15. What do students do in the garden (check all that apply):
See response choices in Appendix B
16. What are your funding sources (check all that apply):
See response choices in Appendix B
17. For your current garden what is your budget?
18. How much funding do you need for the garden?
19. How interested are you in:
 - Learning about garden related curricular materials
 - Learning about how to connect with local partners (farmers, county extension, master gardeners, etc.)
 - Learning about gardening funding ideas
 - Having someone help you with the garden (planning, labor, teaching, knowledge)
 - Networking with other school gardens and learning “tips” from them
 - Learning technical skills like soil amendment, winter gardening and raised bed gardening
 - Visiting other community gardens
 - Visiting other APS gardens
 - Ideas for using the food you grow in the school
 - Learning about tips for working with group dynamics and age appropriateness in the garden

Case Study

Who: (Name, phone, email of contact at school)

What: (Name of school and garden)

Where: (Address of school)

When: (Date and time of site visit)

A. Introduction/purpose

The Growing Gardens team is conducting case studies to produce a report highlighting existing gardens in Albuquerque Public Schools and identifying some of the needs/barriers schools face in starting or maintaining a garden. The case study will consist of questions regarding the logistics and sustainability of school gardening.

Before we get started:

Do you mind if I take hand-written notes as we discuss the questions?

Is it okay to use your name, school name, or other identifiers in the report?

Does the principal of your school know you are participating in the report?
(The report will be widely disseminated)

At any point you may skip a question, refuse to answer, or stop the interview.

B. Background:

- 1) How did the school garden get started?
- 2) Why did you start a school garden?
- 3) How many years has it been running?

C. Logistics:

- 1) How big is the garden? (dimensions)
- 2) Where in the school is the garden located? Is it central/peripheral to layout of the school?
- 3) What is grown in the garden?
- 4) Who manages the garden during the school year and/or summer months?
- 5) What kinds of tasks are performed in the garden?

D. Sustainability:

- 1) What were/are the past funding sources for the garden?
- 2) What are the current funding sources for the garden?
- 3) What are the future funding sources for the garden?
- 4) Who manages/works the garden in the summer months?

E. Integration:

- 1) How many students work in the garden?
- 2) How many parents work in the garden?
- 3) How many teachers/school staff work in the garden?
- 4) How many community volunteers work in the garden?
- 5) Please share some anecdotes from students working in the garden.
- 6) What are barriers or obstacles to students/parents/teachers/volunteers working in the garden?
- 7) What is done with the food grown in the garden?
- Ex: Is it utilized in the cafeteria, is it donated, is it given to students?
- 8) Are educational components integrated into garden work?
- 9) Are lessons learned in the garden complemented/supported by school curriculum?
- 10) What are barriers or obstacles in integrating the garden into the school?

F. Resources/policy:

- 1) What resources (money, volunteers, supplies, curriculum, etc.) would you be interested in accessing? Why?
- 2) What support (program, policy or otherwise) would you like from the school? Neighboring schools? Central administration? Why?

G. Future:

- 1) What are your needs for the future?
- 2) Do you foresee any challenges in sustaining the garden?

3) Do you have any questions for me?

H. Wrap-up:

1) Are there any pictures of students working in the garden (preferable in the summer months) you would be able to share?

If so, in order to include these pictures in the report we need a photo release form.

2) Does the school have a school-wide photo release agreement?

3) If not, would you be able to help identify the students and get the parent photo release form signed?

Thanks so much for your time. I will be typing up my notes and creating a write-up of your answers to these questions. I will send you a copy of the write-up for review and to check on accuracy.

B. Appendix B: Additional survey tables and responses

1. What are your funding sources? (check all that apply)

Answer Options	Response Percent	Response Count
Local grants	34.5%	10
Private donations from parents or community members	34.5%	10
Staff pay out of pocket	34.5%	10
School funds	27.6%	8
PTA funds	27.6%	8
Foundation grants	24.1%	7
State grants	20.7%	6
Federal grants	13.8%	4
Business donations	13.8%	4
Other grants	10.3%	3
Sales/ fundraisers	6.9%	2

2. What do students do in the garden? (check all that apply)

Answer Options	Response %	Response Count
Grow Vegetables	75.9%	22
Grow Flowers	51.7%	15
Quiet space/ timeout space	51.7%	15
Grow Herbs	48.3%	14
Raised bed gardening	44.8%	13
Nutrition / Hunger	41.4%	12
Community Service	37.9%	11
Garden Art	37.9%	11
Composting	37.9%	11
Butterflies	34.5%	10
Garden Themes such as 3 sisters, pizza or salad garden	34.5%	10
Habitat Creation / Restoration	27.6%	8
Container gardening	24.1%	7
Special Needs	20.7%	6
Birds	20.7%	6
Multicultural	20.7%	6
Vermiculture (worms)	20.7%	6
Grow Fruits	13.8%	4
Trees	13.8%	4
Speech therapy	13.8%	4
Occupational therapy	13.8%	4
Horticultural therapy	13.8%	4
Physical therapy	6.9%	2
Intergenerational	6.9%	2
Garden Business	6.9%	2
Greenhouse	6.9%	2
Weather Stations	6.9%	2
Pond / Wetland	3.4%	1
Hydroponics	3.4%	1