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From Field to Museum: Intergenerational Education in Public Archaeology

Abstract

Archaeologists have developed different curricula and methods within museums, classrooms, and field settings that engage the public in learning about the past. One realm of public archaeology that has received little research is studying how intergenerational education impacts engaging learners of varying ages with the past. Community collaboration and place-based education (PBE) have served as relevant topics of research for intergenerational educators. I incorporated intergenerational education methods at an archaeology summer camp at Highlands Micro School and at a temporary interactive exhibit at the History Colorado Center. I utilized surveys to determine changes in perception of archaeology that occurred between research sites and before and after the summer camp; I also observed participants and analyzed what they wrote about their experiences at camp to understand how they interacted with each other intergenerationally while engaging with the past. Community engagement appeared as one of the more important themes within my research and impacted both my qualitative and quantitative data, hinting at its importance to intergenerational education within public archaeology. My findings can be used to help develop intergenerational education methods in archaeology and suggest where and when archaeologists can use these methods to create public engagement with the past.

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A Thesis

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the Faculty of the College of Arts, Humanities and Social Sciences

University of Denver

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Nicholas Daniel Dungey

June 2020

Advisor: Dr. Bonnie Clark

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Abstract

Archaeologists have developed different curricula and methods within museums, classrooms, and field settings that engage the public in learning about the past. One realm of public archaeology that has received little research is studying how intergenerational education impacts engaging learners of varying ages with the past. Community collaboration and place-based education (PBE) have served as relevant topics of research for intergenerational educators. I incorporated intergenerational education methods at an archaeology summer camp at Highlands Micro School and at a temporary interactive exhibit at the History Colorado Center. I utilized surveys to determine changes in perception of archaeology that occurred between research sites and before and after the summer camp; I also observed participants and analyzed what they wrote about their experiences at camp to understand how they interacted with each other intergenerationally while engaging with the past. Community engagement appeared as one of the more important themes within my research and impacted both my qualitative and quantitative data, hinting at its importance to intergenerational education within public archaeology. My findings can be used to help develop intergenerational education methods in archaeology and suggest where and when archaeologists can use these methods to create public engagement with the past.

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Table of Contents

Chapter 1: Introduction	1
Connecting Intergenerational Education and Archaeology	3
Significance and Scope of Work.....	10
Research Goals	12
Summary of Intent.....	14
Chapter 2: Highlands Historical Background	16
A Brief Summary of Denver Pre-History	16
An Overview of Denver History	18
The Development of Highlands	21
Contributing Research.....	26
Highlands Historical Context	28
Historic Structure Assessment of the Highlands Masonic Temple	28
Potter-Highlands Historic District.....	29
Tremont House	29
Phase I and Phase II Investigations for Colorado Historical Society’s New Museum – History Colorado Center.....	30
20th Avenue in Downtown Denver	32
Denver and Highlands.....	34
Chapter 3: Amache Historical Background	36
Amache and Japanese American Internment	36
The Anti-Japanese Movements	37
From Discrimination to Legal Confinement	39
The Internment Process and Living in Camp.....	40
Granada, Colorado and Amache	45
Gardens and Community Gardening at Amache.....	53
Returning Home	57
Chapter 4: Theoretical Framework	63
Place and Landscape Theory.....	64
Materiality	69
Experiential Learning.....	74
Lewinian Model of Action Research and Laboratory Training	76
Dewey’s Model of Experiential Learning	78
Piaget’s Model of Learning and Cognitive Development.....	80
Summary	83
Chapter 5: Methods.....	84
Multi-Site Research and Archaeological Ethnography	84
Research Questions and Research Design	85
Highlands Micro School.....	87

The History Colorado Center	89
A Mixed Methods Approach.....	90
Quantitative Methods	90
Qualitative Methods	92
Archaeology Methods.....	93
Consent, Participant Recruitment, and Archaeological Permit.....	95
Data Management	96
Data Analysis	97
Quantitative Methods	97
Qualitative Methods	100
Archaeological Data	100
Limitations	101
Summary	102
Chapter 6: Findings and Results	104
Research Question 1	104
a) Do significant changes occur between the averaged question scores when comparing pre- and post-surveys?.....	105
b) Do significant changes occur between participants' averaged scores when comparing pre- and post-surveys?.....	107
c) Are adult participants' averaged pre- and post-survey scores similar to child participants' averaged pre- and post-survey scores?.....	108
d) What words do participants use to describe archaeology before and after the archaeology summer camp?	111
e) How do participants feel about their time learning and what observations can be made of them while they participated in the archaeology summer camp?.....	114
Research Question 2.....	135
a) What words do participants use to describe archaeology after participating in the exhibit?	135
b) What observations can be made about adults and children interacting together to learn about archaeology?.....	137
Research Question 3.....	145
Survey Questions 2 and 15	145
Chi-Squared Testing	146
Comparative Thematic Analysis	147
Summary	152
Chapter 7: Discussion of Findings and Results	153
Research Question 1	153
Research Question 2.....	161
Research Question 3.....	166
Summary	173

Chapter 8: Conclusion.....	174
Future Research.....	181
Comparing Monogenerational and Intergenerational Teaching Methods.....	181
Research on Intergenerational Education using Museum Programming	182
Concluding Statement	182
References.....	184
Appendix A: Assent/Consent Form.....	191
Highlands Micro School Adult Consent to Participate in Research Form.....	191
Highlands Micro School Parent or Guardian Permission Form for Child’s Participation in Research	194
Highlands Micro School Verbal Assent Script for Children.....	198
The History Colorado Center Exhibit Disclaimer.....	200
Appendix B: Surveys and Observation Guide	201
Highlands Micro School Survey	201
The History Colorado Center Survey.....	207
Observation Guide.....	209
Appendix C: Highlands Micro School Site Associated Documents and Lesson Plans..	212
Week 1 Summer Camp	212
Week 1 Archaeology Word Bank	223
Archaeology in the Future Worksheet (Developed by Ms. Sara Rove, Highlands Micro School, 2019)	224
Week 2 Summer Camp	225
Week 2 Archaeology Word Bank	235
What Is Archaeology? Worksheet (Smith et al. 1996)	236
Week 3 Summer Camp	237
The Great Garbage Mystery Worksheets (Developed by Ms. Sara Rove, Highlands Micro School, 2019).....	247
Excavation Plan Exercise	250
Final Journal Questions for Child Participants	251
Appendix D: Amache Entryway Garden Archaeology Exhibit.....	253
Gardens at Amache Handout.....	253
Exhibit Worksheet Packet	254
Appendix E: Highlands Micro School Site Report.....	257
Archaeological Research of the Highlands Micro School Site (5DV.35208).....	257
Report on the ground-penetrating radar survey at Highlands Micro School, Denver, Colorado	292
Appendix F: Chi-Squared Tests.....	300
Chi-Squared Individual Survey Questions Totaled.....	300
Chi-Squared Individual Participant Total Scores	301
Chi-Squared Comparing Frequency of Themes in Observation Guides between Research Sites	303

List of Figures

Figure 1: 1929 Sanborn Map of Perry Street, Quitman Street, and 37 th West Avenue (Sanborn Map Company 1929). The red oval indicates the future lot of Highlands Micro School (3719 Perry Street).....	27
Figure 2: Map of all WRA Internment Camps and the West Coast Exclusion Zone. Courtesy of Anne Amati.	37
Figure 3: Mataji Umeda with his garden at Amache. Courtesy of Helen Yagi Sekikawa, his granddaughter.....	55
Figure 4: Rugosa roses growing along the old foundation of an Amache barrack Summer 2016; Photo courtesy of the DU Amache Project.....	57
Figure 5: An illustration of Lewin's Experiential Learning Model (Kolb 2015).....	77
Figure 6: An illustration of Dewey's Model of Experiential Learning (Kolb 2015).	78
Figure 7: An illustration of Piaget's Model of Learning and Cognitive Development (Kolb 2015).....	82
Figure 8: Unit 5E/2N after excavation and mitigation ended.....	94
Figure 9: Picture of Unit 5E/2N west wall stratigraphy; the "west wall" hole is at the bottom.....	95
Figure 10: Plan map of Unit 5E/2N.....	98
Figure 11: Profile of Unit 5E/2N's west wall.....	99
Figure 12: A chart of the words Highlands Micro School participants chose to describe archaeology in the pre-survey.....	112
Figure 13: A chart of the words Highlands Micro School participants chose to describe archaeology in the post-survey.....	113
Figure 14: A chart of the words the History Colorado Center visitors chose to describe archaeology after interacting with the exhibit.....	136
Figure 15: 1929 Sanborn Map of Perry Street, Quitman Street, and 37 th West Avenue (Sanborn Map Company 1929); the red oval indicates the future lot of Highlands Micro School (3719 Perry Street).....	261
Figure 16: Unit 5E/2N before excavation and mitigation began.....	273
Figure 17: Unit 5E/2N after excavation and mitigation ended.....	273
Figure 18: Topo map of the Highlands Micro School Site and surrounding area (TopoQuest 2019); the red square represents Perry and Quitman Streets, and 37 th West Avenue; the red dot represents Highlands Micro School.....	274
Figure 19: Highlands Micro School Site Map.....	275
Figure 20: Plan map of Unit 5E/2N.....	277
Figure 21: Profile of Unit 5E/2N's west wall.....	278
Figure 22: Highlands Micro School students excavating and maintaining Unit 5E/2N; photo taken with permission.....	279

Figure 23: Picture of bottom of hole and stratigraphy	280
Figure 24: Picture of Unit 5E/2N west wall stratigraphy; the "west wall" hole is at the bottom	280
Figure 25: Picture of Artifact No. 0.0.8, a clear glass base fragment with the word "WINE" molded onto its base. Photo courtesy of Manuel Ferreira.....	281
Figure 26: Picture of Artifact No. 1.2.2, a make-up bottle; remnants of dirt and, possibly, previous contents inside. Photo courtesy of Manuel Ferreira.....	284
Figure 27: Picture of Artifact No. 0.0.41, ceramic sherds that form "EAST LIVERPOOL CERAMICS CO." maker's mark. Photo courtesy of Manuel Ferreira.	285
Figure 28: Picture of the back of Artifact No. 0.0.85 with the "DRESDEN" maker's mark. Photo courtesy of Manuel Ferreira.	285
Figure 29: Picture of Artifact No. 0.0.130, ceramic sherds come together to create the "B.R.C." maker's mark. Photo courtesy of Manuel Ferreira.....	286
Figure 30: Picture of Artifact Number 0.0.65 with the Victoria Carlsbad maker's mark. Photo courtesy of Manuel Ferreira.	286

List of Tables

Table 1: Total number of participants based on research site, generation, and data gathering tool.	103
Table 2: Pre-survey/Post-survey Averaged Question Scores Paired Comparison t-Test	106
Table 3: Pre-survey/Post-survey Averaged Participant Scores Paired Comparison t-Test	108
Table 4: Adult and Child Participants' Averaged Pre-Survey Scores Two-Samples Independent, Assuming Unequal Variances, t-Test.....	109
Table 5: Adult and Child Participants' Averaged Post-Survey Scores Two-Samples Independent, Assuming Unequal Variances, t-Test.....	110
Table 6: Frequency of appearance of codes within each theme when comparing observation guides between Highlands Micro School and the History Colorado Center	147
Table 7: Table of the total count of objects found by material type and locale.....	279

Chapter 1: Introduction

Archaeology's not what you find, it's what you find out. ~ David Hurst Thomas

Archaeologists have promoted engaging the public in the field through a variety of methods, including formal and informal education, museum programming and exhibits, and open excavation sites. Developing a relationship with the public has become a goal for many applied anthropologists and archaeologists. This has included creating educational materials related to anthropology and archaeology for interested individuals. Archaeologists have reached people of varying ages and generations, stimulating their imagination and discussion about these fields. Even though intergenerational education and learning occur quite frequently in institutions such as museums, both the method of teaching and style of learning are hardly touched on in educational, public, community, museum, or applied anthropological or archaeological research.

At the start of my graduate career in 2018, Bonnie Clark brought this teaching method to my attention when referring to an exhibit she wanted to create in partnership with the History Colorado Center. While I wanted to develop my thesis around this research site and teaching method, I found there was not enough information there for a thesis.

In December 2018, Ms. Sara Rove, a teacher from Highlands Micro School, contacted Clark and I to discuss a possible field trip to the University of Denver (DU) Department of Anthropology to teach her class about archaeology. We agreed to host them for a day and proceeded with developing lessons for them. Ms. Rove also mentioned that her class had excavated material culture from their playground. What Clark and I thought would be a few ceramic sherds and rusted metal pieces turned out to be two boxes of artifacts that included artifacts such as glass fragments, ceramic sherds, metal fragments, and faunal remains. When Ms. Rove and her students talked about their class and the hole they dug to find these artifacts, we started discussing the possibility of future outreach with the Highlands Micro School community. Over the course of the next few months Ms. Rove and I stayed in contact and developed the Highlands Micro School Archaeology Summer Camp. The camp was open to both adult and child learners to interact with the community archaeology the school's students had stumbled upon through their curiosity.

I also started to move forward with developing the exhibit Clark had spoken to me about before Highlands Micro School's visit to DU. I developed this exhibit with Clark and communicated with the History Colorado Center to work out the required details. This work culminated in the Amache Entryway Garden Archaeology Exhibit – an interactive temporary exhibit created for visitors to learn about Amache, Japanese American internment, archaeology, palynology, and gardens. In May 2019, I tested this exhibit at the History Colorado Center to see how people interacted with it. I brought it

back to the History Colorado Center during that summer to observe intergenerational education and learning in a museum setting.

My goal is to research intergenerational education and learning during these public outreach opportunities to provide insight into this teaching method and learning outcome in regard to public archaeology. By bringing together this educational method and archaeology, I want to examine how they can work in tandem to create an archaeological outreach experience created for all ages. A definition of intergenerational education and learning and a review of their connections to public archaeology are needed to better understand how they can work in tandem to create public engagement with the field.

Connecting Intergenerational Education and Archaeology

Intergenerational education's purpose is to bring together people from different generations to learn with and from each other, creating a form of learning that can reach out to multiple ages. Its objective is intergenerational learning, which focuses on seeing cooperation and education amongst learners from different generations. While different generations learn together on different levels at times (e.g., adults as teachers and children as students), this education method primarily focuses on treating different generations equally as learners (e.g., adults and children as students) who use their unique knowledge and views of learning to come together to create new learning opportunities for both generations.

To further clarify this method, I utilized a formal definition of intergenerational education for my research by M. Sánchez et al. (2007:35 italics in original), quoted by Mannion and Adey (2011:37):

[Intergenerational education includes activities] *or programs that increase cooperation, interaction and exchange between people from any two generations. They share their knowledge and resources and provide mutual support in relations benefiting not only individuals but their community. These programs provide opportunities for people, families and communities to enjoy and benefit from a society for all ages.*

Community participation and knowledge-sharing are crucial aspects of intergenerational education that create a pool of combined resources that all generations can tap into for a better learning experience. Intergenerational education is a way to construct a bridge between generations to learn with and from each other (Kaplan 1994). Its goals align with some of the overarching objectives of public archaeology.

Public archaeology extends itself to other subdisciplines such as archaeological ethnography (Hamilakis and Anagnostopoulos 2013), community archaeology (Clark 2017; Horning 2013; Moser et al. 2002), educational archaeology (Colley 2002; Fagan 1977; Hood 2018; Smardz Frost 2004; Riley 2019; Wernecke and Williams 2017) and subsequent curricula (Poole 2019; Smith et al. 1996), and museum archaeology (Colwell 2017; Merriman 2004). This broad field is outlined by Nick Merriman (ed. 2004) in his edited book *Public Archaeology* and includes varying views from different archaeologists of archaeology's relevance to the public. Mapunda and Lane (2004:212; 214) define it best. Public archaeology includes

methods that may be more suitable for bringing archaeology to the rural and urban populace... [where] the failure to recognize the importance of engaging [local publics] in the research process has alienated the local people from their own cultural heritage instead of retrieving, studying and preserving it for them.

Mapunda and Lane make a good point in bringing the local/affected communities into the archaeological process. Community collaboration and outreach in public archaeology go

hand-in-hand with intergenerational education. Both fields' main goals revolve around community learning processes and knowledge-sharing with others.

Researchers have contributed to the field of intergenerational education by working with different communities to explore ways in which intergenerational populations promote learning opportunities. Community plays an important role in intergenerational education. Mannion and Adey (2011) researched place-based education (PBE) through environmental education and working with a Scottish school community. The school came together as intergenerational learners to work with a garden, which allowed opportunities for multiple generations to interact with and learn from each other to create a community that is "more permeable" (Mannion and Adey 2011:38). Adults have more access to interacting and learning with/from children, while children have the same access to adults. Schools can become places where community barriers erected between generations have the ability to be brought down or removed. Community permeability and interaction occurs more frequently in these settings, emphasizing educational processes through people coming together to learn from each other.

Further research on intergenerational education and community has been conducted by Kaplan (1994). His research shifts away from PBE towards a study that examined community involvement and improvement between multiple generations. Participants interact with their local community on an almost daily basis that allows them a first-person, subjective view of the world. This affected them and sometimes provided ideas for community development. Older and younger generations then worked together with "the participatory process in the planning, development, and management of

environments” and expressed that “local interests... [facilitate] supportive social ties... and [reinforce] community responsibility and resourcefulness” (Kaplan 1994:48).

Kaplan (1994:48-49) continues by stating his concerns about “mono-generational planning for a multi-generational setting,” or how one generation intends to speak for multiple generations in the upkeep of a local community. This occurs frequently: children learn in schools away from adults and older generations make changes to their communities without input from younger generations. Creating an intergenerational educational setting for these communities allows the permeability Mannion and Adey (2011) referenced, while also bringing together people to learn from those with different experiences.

In a museum setting, different learning opportunities can involve both community-based and education-based projects. Hood (2018) researched college students using teaching as a learning tool when working as museum docents. Student docents are provided the opportunity to work with different community members and learn from the way they teach, adapting their teaching style as they do so. Interactions between museum visitors and student docents can create intergenerational education, but more importantly students are understanding what they have learned more clearly through teaching. This applies to community and intergenerational situations as it relates to the idea that “students who teach study the material more closely than those who do not... [and] visitor learning experiences are enhanced by opportunities to have conversations with others” (Hood 2018:1-2). In this museum setting, college students have the chance to interact with visitors of varying ages that allows them to “share their knowledge with others in an

authentic context where they are fulfilling a real need of other people” and receive “timely feedback on their efforts” (Hood 2018:1-2). This idea of teaching as a learning method can be transferred to community and intergenerational education experiences. This provides different generations the chance to instruct others while gaining new knowledge to expound upon past learning in almost real time.

Another example of intergenerational research is a study on intergenerativity, a term defined by Daniel George et al. (2011:392) as a way for “sharing change across boundaries that normally separate discourse and represents the energy that can be achieved by connecting otherwise divergent fields of human endeavor.” Such a word is all-encompassing and refers to other areas of human understanding outside of intergenerational education. Intergenerativity fits into my research because it applies to knowledge exchange between adults and children. Knowledge is the energy referred to by George et al. (2011). Seeing intergenerativity in action includes witnessing the exchange and reception of these ideas between generations.

Research projects such as the DU Amache Project, summarized by Clark (2017), provide ways for a community population to interact with archaeologists to exchange knowledge about their own experience. For example, Clark (2017:88) recounts how a “former internee who visited us that summer [2010] recalled that eggshell, tea leave, and coffee grounds were all highly prized soil amendments.” This community member shared with Clark the experience of creating and cultivating different gardens at the internment camp. Their exchange provided firsthand information from someone who lived through the internee experience, which in turn provided a source of knowledge that could help

explain a certain group's behaviors. While Clark did not use this explanatory framework, this is a form of intergenerativity: an exchange of ideas between generations to expound upon previous knowledge.

Another recent archaeological study by Dale Croes and Darby Stapp (2018) capitalized on a generational-link between a man named Ed Carriere and his people, the Suquamish Tribe in the Northwestern United States near the Salish Sea. Croes used his archaeological knowledge of Suquamish basketmaking to work together with Carriere to incorporate old weaving methods into his craft. Using basket fragments found by Croes, Carriere recreated the baskets in full, bringing a past practice to the present through research of archaeological material culture. Termed "generationally-linked archaeology" (Croes and Stapp 2018), this archaeological method that straddles the lines between intergenerational education, experimental archaeology, and community archaeology helped bring past knowledge to the present. Generationally-linked archaeology helped reintroduce these methods to Carriere's basketmaking. Knowledge crossed a large gap in the form of the archaeological record, but such a transfer of knowledge from material culture still provides an example of intergenerativity in archaeology.

Intergenerational education researchers have also focused on the learning differential and divide that has occurred as formal public education for children has developed over the years towards schooling and grade levels. In most cases this prohibits forms of intergenerational education between adults and children during the school day. Vieira and Sousa (2016) have written a review of the research on intergenerational practices (IGPs) in educational settings. Their review further expands upon the contemporary education

system, stating how “education... handled nowadays has created a division between how children go to school, adults go to work, and elders are at nursing homes or other such care facilities” (Vieira and Sousa 2016:396-397). This is a separation that many American families face at one point in their lives. Such a separation dissuades learning across multiple generations and does not prepare children for a multi-generational world. Other studies and reviews on using intergenerational education in formal and informal settings have tackled this issue, providing research in support of IGPs (Martin et al. 2010; Springate et al. 2008; The TOY Project 2013).

My work is also informed by research that addresses the way in which archaeologists educate the public on their field, creating outreach opportunities and relationships. This includes research into curriculum development for archaeology by the Bureau of Land Management (BLM). Jeanne Moe (2019) has researched curriculum-use in schools in relation to the BLM’s archaeology curriculum, *Intrigue of the Past* (Smith et al. 1994). She has summarized how archaeology is used as a way to teach different subject matter, expanding upon how educators teach students about this field in schools. However, as she has stated, “there has been very little research on what students actually learn about archaeology and what they understand” (Moe 2019:9). Few researchers have delved into this topic, providing little understanding of how archaeologists can promote education on archaeology. She concludes that working with material culture and the archaeological record appears “to engage students more than do hypothetical archaeological contexts... [and] several students reported that the content had an impact on them because of the personal connection” (Moe 2019:22-23). Educators want different ways to develop a

learner's personal connection to archaeology while also providing ways to work with the archaeological record. Research into other methods such as intergenerational education and IGPs within public archaeology may improve these education and outreach opportunities.

Where archaeologists are using curriculums and searching for ways to engage communities in different settings (Clark 2017; Colley 2005; Fagan 1977; Haas 2016; Hood 2018; Merriman 2004; Moe 2019; Simandiraki 2004; Smardz Frost 2004; Smith et al. 1994; Wernecke and Williams 2017; Zarmati and Frappell 2019), there are certain research opportunities that are present in these studies but not well documented. Determining the way archaeologists approach teaching archaeology through public education and outreach is something many have pondered. Where IGPs, intergenerativity, and intergenerational education have been studied, archaeologists have opportunities to use them in museums, classrooms, and the field. Archaeologists have connected the public interest of archaeology to an educational experience, but the studies above have also shown examples of intergenerational practice in archaeology at work, yet hardly studied. Bringing different generations together to learn about the past through archaeology has the opportunity to affect the public's attitudes towards this field.

Significance and Scope of Work

Educating the public on archaeology has been a continuing topic of conversation for archaeologists, especially when trying to relate archaeology to these publics on a personal level. This includes the idea of stewardship, where focusing on the protection of sites and the importance of the information they can provide is an ethical principle laid down by

the Society for American Archaeology (2018). This connection appears to miss the mark at times, even more so when archaeology is not touched on in many formal places of education before college. Providing spaces for continued learning about the past in settings such as museums or field schools can give the public the chance to learn about and connect with archaeology. Researching ways to create such continued learning spaces can help develop these opportunities for not just children, but adults. That is why researching intergenerational education in public archaeology may provide insight into ways of learning between generations.

Now, it must be stated here that my thesis research does not focus on developing a curriculum. As the reader will see, the methods revolving around intergenerational communication, education, and learning change depending on location. How learners interact with archaeology will vary from site to site. For example, my thesis research focuses on two research sites: a field setting at Highlands Micro School and a museum setting at the History Colorado Center. The former focuses on interacting with archaeology through survey, excavation, and lab work; the latter focuses on interacting with archaeology through an interactive exhibit. Both sites use a form of intergenerational education, but different teaching material. With this in mind, the main goal of my thesis is to understand if intergenerational education can change participants' attitudes towards archaeology, and where and how this method can be best put to use when engaging the public in archaeology.

Research Goals

Having summarized the main goal, I will state the guiding sub-goals that have helped me develop my thesis research. My research focus gave me a little more freedom to develop forms of education that did not conform strictly to Colorado curriculum guidelines. While taking place in a formal education setting, Ms. Rove and I introduced the Highlands Micro School Archaeology Summer Camp as a camp, not a class; the Amache Entryway Garden Archaeology Exhibit provided a place for learners to choose the ways they learned in a public setting. Because of this freedom and these more informal educational settings, I could use methods outside of standardized testing and graded curriculum-based work. I expand upon these methods and lessons in Chapter 5.

I mention these educational tools and my freedom in designing them because they helped to shape my main research goal. The goal of my thesis revolved around three sub-goals that will appear in my research questions and sub-questions.

First, I wanted to understand if, over the course of the Highlands Micro School Archaeology Summer Camp, attitudes about archaeology significantly changed within an intergenerational setting. Understanding if these changes occur can help in deciphering if intergenerational education and learning provides an experience that impacts how students view archaeology. Due to certain limitations, which I outline later, I could not use a control group to determine if one educational method is better than the other. I can still determine if participants' attitudes did change after learning together. Conducting quantitative analysis using a survey rather than standardized testing provides a way to

gauge positive or negative changes in attitudes towards archaeology over three weeks at the summer camp.

Second, I wanted to know how participants at both research sites interacted with each other and the learning opportunities presented to them. This helps in determining what ways an intergenerational audience interact with archaeology. Observations and participants' own words provide insight into their interactions with and personal ideas regarding archaeology. With this insight, I can qualitatively analyze this data to understand how participants view learning about archaeology with learners from different generations.

Finally, I wanted to know if location or place had an impact on the ways in which the publics I worked with learned about archaeology. This final sub-goal requires bringing together the data I collected from both research sites and comparing them. Certain limitations to my thesis research forced me to do a limited comparison that only covered a small part of the participants' perceptions of archaeology. However, my research can still provide a place to start in regard to intergenerational education and learning within this field. This comparison is not meant to prove one research site is better than the other when it comes to intergenerational education and learning. Instead, I intend for this comparison to examine the different learning opportunities available to the different publics and discuss how intergenerational education methods may be applied at both types of sites. What I have learned about intergenerational education through my thesis research is that it occurs quite frequently as members of different generations communicate with each other. Providing an overview of my analyses between research

sites can give educators the data they need to better construct tools geared towards a more fluid and permeable intergenerational educational setting.

Summary of Intent

Due to the use of two research sites, my ethical responsibilities were important to consider when interacting with participants and dependent on working closely with an archaeological site and its subsequent material, a school, a museum, and the Japanese American community. In Chapter 5, I provide more detail on my ethical assurances towards my thesis research.

By engaging the publics I worked with in archaeology, I wanted to provide an experience that could teach them about their connections to the past. This also provides the opportunity for participants to engage with learning about archaeology when they may not be able to otherwise. I also want to use my thesis research and the archaeological report written for the Highlands Micro School Site to provide a brief view of the archaeological record in the Highlands neighborhood in Denver, Colorado. It also supports the Japanese American community and promotes learning about the realities of internment in the United States during World War II. By employing archaeology to promote education of the past, I want to encourage continued learning and knowledge-sharing between generations to stimulate interest in the past.

Copies of my thesis will be shared with Highlands Micro School and the History Colorado Center to help promote ideas and ways they can use intergenerational education within their institutions. While writing my thesis, I have also created a brochure for Highlands Micro School about their community's archaeology, written a report in

conjunction with Clark and Brian Brunst on the archaeology of Highlands Micro School for Colorado's Office of Archaeology and Historical Preservation (OAHP), and crafted an exhibit that the History Colorado Center uses as an interactive opportunity for visitors to learn about Amache and Japanese American internment.

Creating intergenerational educational settings within communities can promote back-and-forth discussion about archaeology and what it means to them. While not a well-known teaching method, intergenerational education can improve upon or create community relationships that stimulate continued learning. Encouraging intergenerational interactions can help in furthering the mission of promoting a society for all generations, constructing connections between community members, and creating ties to the past.

Chapter 2: Highlands Historical Background

The Highlands neighborhood in Denver, Colorado has a historical past that is connected to the Greater Denver Area which has a storied prehistory and history. While historians have touched on the neighborhood's history, archaeologists have done little to no work there. Currently, Highlands is a neighborhood within Denver. In the past, it was its own city known for wanting to serve as a Utopia or the Eden of the West. Highlands' citizens and city council held this attitude during the late 19th century before Denver annexed it and removed its status as a separate, sometimes competing, entity. Neighbors showed pride in their city by creating gardens, caring for their houses, and obeying the strict laws set forth by the Highlands' city council.

This historical background on Highlands and Denver, Colorado is echoed in my field report submitted to Colorado's Office of Archaeology and Historical Preservation (OAHP).

A Brief Summary of Denver Pre-History

Paleoindians inhabited the Greater Denver Area as early as 12,000 BC, lasting until the Plano culture in 5500 BC. Sites that represent these Paleoindian occupants are few. Examples of Clovis (11,500-9500 BC) and Plano (8500-5500 BC; Stone and Mendoza 1994) objects have been excavated in the Greater Denver Area. Archaeologists have also found Archaic period (5500-1 BC) projectile points at several significant prehistoric sites

near Denver, including Magic Mountain and Franktown Cave. Ceramic period (AD 1-1500) peoples are well represented at Franktown Cave, an important site in the Greater Denver Area where archaeologists have found a wide range of perishable artifacts (Nelson et al. 2008).

Ethnohistories, ethnographies, and firsthand written accounts help establish Native American tribes who lived on the plains and migrated around the mountains in the Greater Denver Area at the beginning of Spanish contact in the 16th century. During this time period, the Apache inhabited the plains around this area. The Ute inhabited the mountains to the west. Archaeological evidence of these tribes is thin and difficult to discern, but historical accounts have placed the Apache, Arapahoe, Cheyenne, Comanche, and Ute historically around Denver (Nelson et al. 2008). The Treaty of Fort Laramie further recognized land holdings for different Native American tribes, recognizing the Greater Denver Area as Arapahoe and Cheyenne territory (Leonard and Noel 1990).

Nothing in the current archaeological record at Highlands Micro School suggests that the site is connected to any prehistoric or Spanish contact period context. However, a brief background on the prehistory in the Greater Denver Area establishes who lived within the region before Spanish, Mexican, and later explorers, and Euroamerican pioneers. As of now, the excavated artifacts, census data, and Sanborn maps indicate that the Highlands Micro School site and surrounding historical context dates between 1890 to 1940, after Denver had been founded.

An Overview of Denver History

Before the Greater Denver Area became United States territory, the Spanish and Mexicans traveled north from New Spain (present-day New Mexico) to this area. This included traders, such as the Hispanos and *comancheros*, and hunters and trappers, such as the buffalo hunters known as the *ciboleros*. Even as this area became United States territory, people of Spanish and Mexican descent still lived and traded with Native Americans in the Greater Denver Area (Leonard and Noel 1990; Nelson et al. 2008).

As Americans traveled west to explore the territory their government had gained through recent land acquisitions, several American explorers passed through the northern Colorado Plains that would eventually transform into Denver, Colorado. Many were unimpressed, including Zebulon M. Pike and Stephen H. Long, who, in the middle of the 19th century, “warned of a great desert west of the hundredth meridian” (Leonard and Noel 1990:3-4). This did not stop trappers and traders from visiting the area to apply their skills and interact with Native American tribes who seasonally occupied the area around the Platte River. It was not until 1850, when Lewis Ralston discovered gold at Ralston Creek, that people started flocking to the Colorado Plains in hopes of finding the precious mineral themselves (Leonard and Noel 1990).

People started to gather around the Platte River in response to the discovery of gold. Few of them found success in mining. That did not stop the small town of tents from expanding while simultaneously pushing away Arapahoe and Cheyenne tribes from their tribal lands. As time passed and expansion continued, family members and men from William Green Russell’s party established the first town in the Greater Denver Area,

Auraria, on November 1, 1858 (Leonard and Noel 1990). This event continued to displace Native American tribes who had traditional claim to this land. Auraria became an unruly town of primarily men who focused on mining or applied themselves to different trades as the rumor of gold slowly faded away into disappointment.

Three weeks after the founding of Auraria, General William H. Larimer, Jr. founded the Denver City Town Company on November 22, 1858 to officially lay claim to land he already considered his (Leonard and Noel 1990). This would eventually lead to a rivalry between Auraria and Denver City, until the latter annexed the former. Annexation had its roots in Denver City's stagecoach connections through the Leavenworth and Pikes Peak Express stagecoach companies. Both companies helped create connections to the Colorado Plains and allowed businesses such as hotels and saloons to flourish.

While many ex-miners started to make a living through other monetary ventures, some continued to pursue the dream of a second gold rush. Miners only found gold dust until January 1859 when George Jackson discovered gold on Mount Evans; May 1859 when John Gregory struck gold veins near what would become Black Hawk; and that same year when William Green Russell discovered gold at the South Platte River (Leonard and Noel 1990; McMahon 2008).

The area grew as word of the next gold rush started to encourage more settlers to move to the blossoming plains town. Eventually, the United States Government created the Jefferson Territory that included parts of present-day Colorado, Kansas, Nebraska, New Mexico, and Utah on October 24, 1859. After Auraria and Denver City came together under one name on April 6, 1860, 'Denver' became the territory's first capitol in

an effort to create a government and sense of law in the otherwise lawless frontier lying in the shadow of the Rocky Mountains (Leonard and Noel 1990).

As Denver grew, buildings started to expand outwards, pushing the Arapahoe and Cheyenne tribes further away from their spring campgrounds. While peacefully interacting with American settlers and miners at first, Native American raiders, pushed by their need for food and supplies, led raids on wagon supply trains entering Denver, which disgruntled Denverites. Many tribes did not participate in these raids, but the pioneers treated them as one people, painting all Native Americans as violent. This further supported American pioneers' claims to this land in the American government's eyes, eventually forcing Arapahoe and Cheyenne chiefs to agree to terms with Albert G. Boone. All involved parties signed the Treaty of Fort Wise which effectively gave control of Denver and its lands to the United States government in 1861. That same year, on February 28, 1861, Congress disbanded the Jefferson Territory and created the Colorado Territory, named after the Colorado River (Leonard and Noel, 1990).

Even after Colorado became a state in 1876 and Denver named its temporary capitol that same year (named the permanent state capitol in 1881), the state and city still faced problems such as a typhoid outbreak due to dirty water in 1879 (Leonard and Noel, 1990). Around 1864, Cherry Creek and Downtown Denver also experienced flooding that prompted citizens to search for higher-elevated land. This would lead to change for Denver and its citizens, who searched for other places to live in that were close to, but not in the city.

The Development of Highlands

The area of Highlands, Colorado became one such location. In 1858, General Larimer, Jr. and D.C. Collier staked out land north of Denver, establishing the Highland townsite – a different entity than what would become Highlands. They formed the Highland Town Company in 1859; however, they never did fully incorporate the town (Hunt n.d.; Simmons and Simmons, 1995). This ended the first attempt at creating an urban center in North Denver.

The town of Highlands was not incorporated until 1875, thanks in part to land development in the Potter-Highlands District. Land development and allotment started after the First Baptist Church of Denver, founded in December 1863, was sold to pay off its loans after its founder, Reverend Walter McDuffie Potter, passed away in April 1866 (Denver Public Library 2018; Norgren 1980:11). Land developers would eventually turn this land into a thirty-six-block residential district that would help promote the city as a place to live after the flood of May 1864 in Denver. The combination of new, allotted land and flooding prompted people who had lost their homes to move to Highlands (Denver Public Library 2018; Hunt n.d.).

As more and more people moved to this new town, local citizens eventually established a village government in 1875 after developers petitioned the Arapahoe County Commissioners for such. A year later in 1876, the Highlands city council signed a town charter (Wiberg 1976) and in 1885, Highlands annexed Potter-Highlands and Highland Park to expand the city (Hunt n.d.). To promote Highlands, citizens touted its “clean air high above the smoke and industry of Denver, clean artesian water, and most

important[ly], clean morals” (Denver Public Library 2018). This “artesian water,” originally discovered by R.L. McCormick, was comparably cleaner to Denver’s strained water (Denver Public Library 2018) and resulted in 130 artesian water wells and the founding of the Beaver Brook Water Company in Highlands in 1886 (Simmons and Simmons 1995; Wiberg 1976:55).

Industry had taken hold of Denver as it started to expand. Areas such as Larimer Square became popular for their bars and brothels. Across the Platte River, bar owners found it harder and more expensive to acquire liquor licenses in Highlands, discouraging alcohol vendors from establishing pubs or breweries within the city (Leonard and Noel 1990; Wiberg 1976).

Air also suffered from the industrial movement in Denver, thanks in part to the fumes created by local smelters, whose towering smokestacks dominated the city skyline. Highlanders touted their air quality, prompting tuberculosis patients to move to the blossoming town. Institutions such as the Oakes Home (later renamed St. Elizabeth’s Retreat after 1943) became a shelter for these ill Highlands migrants (Simmons and Simmons 1995; Wiberg 1976).

Citizens emphasized their newfound home’s beauty through its nature. Gardens served to reflect a green Eden. Landscaping started as early as the inception of the town in 1875. Five-thousand trees lined the sidewalks, receiving free irrigation from the town. Members of the Highlands upper-class built gardens to accentuate their houses. As visitors came to Highlands, some would go so far as to compare these luscious human-grown environments to the Hanging Gardens of Babylon, while citizens of different

status came together on these lawns to celebrate themselves and Highlands (Wiberg 1976:71). Highlands citizens wanted to exemplify the hard work and life that molded them into “Rhodes scholars at Oxford, presidents of universities, judges, politicians, bank presidents, artists, doctors, lawyers, merchants, [and] craftsmen” (Wiberg 1976:73).

Highlands residents touted their pure morality. The ordinances the city council passed reflected these morals and banned flying kites or playing marbles in the streets, prohibited the use of abhorrent language, and encouraged working men to conduct their business in Denver before traveling home to Highlands for rest (Simmons and Simmons 1995; Wiberg 1976). However, the archaeological record seems to contradict the supposed adherence to these ordinances. Material culture found at the Highlands Micro School Site included such objects as a poker chip (gambling) and amber glass bottle fragments (alcohol, beer, and wine). While its residents wanted outsiders to view Highlands as a Utopia, locals may have decided this view did not apply to their private lives.

Public transportation grew in the 1870s and 1880s in the Denver area. This boom in public transportation allowed more people to commute from suburban cities and towns, like Highlands around 1873 (then called North Denver), to their workplaces in downtown Denver. Electric tramways did not successfully make it to Highlands until 1889 and again in 1891 (Convery 1999; Leonard and Noel 1990; Norgren 1981:10; Simmons and Simmons 1995). The 23rd Street Viaduct was constructed in 1887 in North Denver but was not strengthened to carry cars until 1908 and 1909 (Simmons and Simmons 1995).

Gas and electricity followed the expansion of tramways in the later 1800s (Convery 1999; McMahon 2008).

Everything seemed to be working in Highlands' favor as the city pushed to become an Eden of the West, a Utopia (Wiberg 1976). This would not last. The Panic of 1893 stemmed the flow of miners along Prospect Trail (now 38th West Avenue) and added to the financial strains the city had struggled to overcome (Denver Public Library 2018; Wood et al. 1999). Three years after the market crash, the town's city council found it difficult to maintain basic services due to financial problems. On July 24, 1896, residents voted to annex Highlands to Denver (Hunt n.d.; Simmons and Simmons 1995). Highlands had bragged about its purer and higher standards of living, but it could not escape the financial woes that had plagued it since General Larimer, Jr.'s original staking of the area and Reverend Potter's failed attempt at founding the First Baptist Church of Denver.

During the early 20th century, the Denver government constructed viaducts to the Highlands neighborhood dedicated to pedestrian traffic and electric streetcars/tramways. Construction projects included constructing the 14th Street Viaduct in 1899, reconstructing and extending the 16th Street Viaduct in 1908 and 1909, and constructing the 20th Street Viaduct in 1911. Ease of access allowed Highlands to grow further, promoting business districts as they appeared next to the tramways, including along 32nd West Avenue in the 1910s and 1920s, and Tejon and Navajo Streets. Meanwhile, the Platte Street commercial area developed during the early 20th century. Viaducts and the

vast web of trolley routes improved access to Highlands, allowing residents easy access to public transportation (Simmons and Simmons 1995).

In Highlands between 1893 to 1939, more people had started to move into the area, populating the numerous available lots with mansions and homes (Denver Public Library 2018; Hoehn and Hoehn 2006). This included lots around a future place of education and site of archaeological excavation: Highlands Micro School. Located at 3719 Perry Street (Figure 1), the lot where the school would be built had been platted by 1893 (Sanborn Map Company 1893). While construction occurred around Perry Street, properties did not appear on Sanborn Map lots until later, even though the 1900 census indicates people lived on some of the neighboring properties prior to the 20th century. Dwellings and automobile garages appeared on the Sanborn map from 1929 (Sanborn Map Company 1929) next-door to 3719 Perry Street. Yet it appears that the current schoolhouse building is the only property to have been constructed on this lot in 1989 (Denver Assessor's Office 2019). Because this lot remained empty until the late 20th century, archaeologists believe that next-door neighbors could have used the empty lot for throwing away their trash, as exemplified by the currently known archaeological record.

Assessment data shows construction on lots next to 3719 Perry Street started in 1890, expanding upon the 1893 Sanborn map. The Denver Assessor's Office shows that contractors originally built upon these neighboring lots between 1890 (3727 Perry Street) to 1919 (4015 37th West Avenue). These data and the archaeological record provide a date range for the Highlands Micro School site from 1890 to 1940. The end date is based

on maker's marks and other temporally diagnostic data from recovered material culture at the Highlands Micro School Site and the area's 1940 census record.

Census data indicates that people occupied the houses around the 3719 Perry Street lot during this time period. They included families and members of the working class, including people who worked as brick layers, carpenters, bookkeepers, signal managers at railroads, and woodworkers. Neighbors next to 3719 Perry Street were listed as of German descent, while neighbors who lived along Quitman Street, the street next to and west of Perry Street, were listed as of German, English, Danish, Slovenian, Austrian, and American descent. While house owners along Quitman Street moved in and out of the neighborhood quite frequently between 1890 to 1940, neighbors who lived next to 3719 Perry Street continuously occupied these houses from 1910 to 1940 (Denver Assessor's Office 2019). A myriad of people lived around the future-lot of Highlands Micro School, showcasing some of the diversity in ethnicity and occupation that occurred in Highlands after Denver annexed it.

Contributing Research

Little has been done in terms of archaeological research at Highlands. However, architectural surveys of the Potter-Highlands Historic District have been conducted and a historical context has been written on the area. In Denver, archaeologists have conducted excavation at different locations, including the Tremont House and along the 20th Avenue Viaduct in Downtown Denver. This research has been included to provide extended context for the Highlands area and where it might fit within Denver's archaeological, constructed, and written history.



Figure 1: 1929 Sanborn Map of Perry Street, Quitman Street, and 37th West Avenue (Sanborn Map Company 1929). The red oval indicates the future lot of Highlands Micro School (3719 Perry Street).

Highlands Historical Context

R. Laurie Simmons and Thomas H. Simmons (1995) documented the Highlands Neighborhood to identify significant properties and potential historic districts, while also creating a historical context for the neighborhood. They incorporated architectural records and historical accounts to create it, starting with the Townsite of Highland in 1858 to Denver's annexation of Highlands in 1896 to the growth of Highlands in the 20th century. They write details on the development of businesses, infrastructure, and population growth throughout the town's history (Simmons and Simmons 1995).

Historic Structure Assessment of the Highlands Masonic Temple

Tim Hoehn and Kris Hoehn (2006) wrote an historic structure assessment (HSA) for the Highlands Masonic Temple. It is depicted as significant architecture and the City and County of Denver designated it as a contributing structure to the Potter-Highlands Historic District. The main purpose of this HSA was to provide the building's historical significance and maintain it through a preservation plan created by Hoehn and Hoehn for the Highlands Masonic Temple Association. Since construction ended in 1928, the Highlands Masonic Lodge #86 and five other lodges have occupied the building, pushing for more public accessibility in 2002. The temple is neoclassical in design and had few interior changes, but several exterior changes. A portion of the preservation plan addressed this issue and how these changes could be fixed, partially restoring the historical significance and originality of the building (Hoehn and Hoehn 2006).

Potter-Highlands Historic District

The Potter-Highlands District in Highlands is an identified Historic District on the NRHP based on its architectural and historical significance and integrity. Barbara Norgren (1981) conducted an architectural survey of the Potter-Highlands District and neighboring Highland Park (which did not receive designation at the time due to lack of integrity) in consideration of an NRHP designation. Norgren's survey cataloged 1044 total properties, 542 buildings built between 1900 and 1940, 292 buildings built between 1870 and 1899, and 147 Queen Anne style structures. The Denver Landmark Preservation Commission designated a local Queen Anne Historic District in Potter-Highlands as a local landmark district in May 1979. The area contains several different historical structures of note. A full list of the particular historical structures can be found in Norgren's survey report (1981). This includes three structures inventoried by the Office of the State Archaeologist of Colorado (OSAC): Weir Building and Hall (5DV.85.2), Charles Barth House (5DV.83.38), and 3257 Alcott Avenue (5DV.85.45); and a building on the NRHP: St. Elizabeth Retreat Chapel (Oakes Home).

Tremont House

An important founding hotel for those traveling to Denver in the 19th century, the Tremont House Hotel served as a rest stop and venue for tourists and Denverites ranging from the most affluent, such as territorial governors, to the downtrodden at the turn of the 20th century. Construction on the Speer Boulevard Viaduct started in the 1980s, prompting archaeologists to excavate and record the remains of the hotel from 1988 to 1989.

The hotel's history of ownership shifted from owner to owner, starting with its founder Mrs. Maggard ("Mother Maggard") in 1859. She eventually sold the then-named Temperance Hotel to on-again, off-again owner Nelson Sargent who expanded the renamed hotel, the Tremont House Hotel, and made it one of Denver's premier destinations in the 1860s. The hotel ultimately lost its status in the late 19th century and the Denver city government condemned it after the flood of 1912.

The archaeological report provides information on the architectural history of the hotel as it changed ownership. Faunal remains also provided a record of food-related culture that started with more wild game, such as prairie chickens, elk, and, especially, rabbits, during the Tremont's early days to its use of well-cut beef reported on by local newspapers that helped advertise the establishment during its peak. Finally, the rise in imported goods at the Tremont, based off the material culture found in different stratigraphic layers, followed the trend of historical changes in railroads and trade routes over the course of the 19th century, matching the historic economic changes Denver experienced over time (Carrillo, et al. 1993).

Phase I and Phase II Investigations for Colorado Historical Society's New Museum – History Colorado Center

RMC Consultants, Inc. conducted investigations of the History Colorado Center's future location in 2008. Phase I focused on conducting archival research of the area around and within 1200 Broadway. It focused on Sanborn maps, General Land Office (GLO) maps, the Master Title Plat to 1200 Broadway, and historical photographs of the area. However, they could not determine if structures were built before the 1890 Sanborn

map, even though J.E. Hendricks and J. Pierce conducted land survey of the area in 1861 and R. Fisher in 1862, and Henry C. Brown patented the area in 1866. They moved on to Phase II, which focused on using GPR survey to locate subsurface features. Lawrence Conyers did find subsurface anomalies 66-132 centimeters below surface (cmbs), with the deepest anomaly at 132-154 cmbs, specifically in the southeast section of the project area. (Killam and Bevilacqua 2009).

Todd McMahon (2008) conducted archival research and wrote up a report on his findings for Phase I. David Killam and Chris Bevilacqua (2009) included this report as Appendix B in their own report on Phases I and II. This report answered questions revolving around original building locations, general history of the area and Denver, and construction impacts. It also provided a brief glimpse on city utilities and construction/infrastructure in the late 19th century, adding to the resources used in this background to further develop a history on transportation and infrastructure in Denver and Highlands (McMahon 2008).

Both reports provided information on the possible subsurface archaeological material located at this site. Using GPR and McMahon's archival research (2008), archaeologists determined that the identified subsurface remains and structural remains were likely from the 1900s. The deepest structure (132-154 cmbs) was possibly an ancillary structure. GPR and the archival research hinted at GPR and Sanborn map correlations for 23-41 12th Avenue and 1211 and 1215 Lincoln Street. Based on these results from Phase I and II, Killam and Bevilacqua proposed research themes that focused on mobility in a Victorian urban context, urban development, gender and ethnicity, inter-household

relations in a high-density setting, and technology-use. They also urged for a Phase III of the project to conduct data recovery, specifically in the southeast corner of the project site (Killam and Bevilacqua 2009).

20th Avenue in Downtown Denver

The 20th Avenue Viaduct Replacement survey took place in Downtown Denver in 1995 and focused on the archaeology surrounding the street. Archaeologists conducted survey to examine the historical archaeological remains of the area, uncovering 11 locales that could potentially yield historic material culture or features. Furthermore, they conducted research on Sanborn maps and census data to research the layout of the historical 20th Avenue and the people who inhabited local dwellings. Combining historic data and the site features uncovered during the survey, archaeologists made recommendations on how to mitigate damage to the site before the viaduct replacement project took place. This included GPR survey, the possibility of a Data Recovery Plan, identifying the area of potential effect (APE), collecting sub-surface material culture, and recording sub-surface features (Carrillo and Clark 1995).

Historical Archaeological Testing and Data Recovery for the Broadway Viaduct Replacement Project

After the original survey and recommendation of a data recovery plan at the 20th Avenue Viaduct Replacement project, an archaeological team followed this recommendation and proceeded with data recovery and excavation of identified features and locales along this project. Their work was extensive, focusing on excavation of 1x1 meter units, trenching, mechanical excavation, consulting Sanborn maps and Denver city

census data, test units, utilizing backhoes, identifying main buildings (features) and ancillary buildings (such as outhouses or other such constructs), drawing plan-view and cross-section sketches, photographing, screening through ¼” mesh, and drawing profiles once archaeologists completed excavation. During this work, they gathered data on the features to understand the architecture of the time in relation to socio-economic status and artifacts such as glass fragments and faunal remains to shed light on day-to-day life in this area from the late 19th to early 20th centuries.

They found features related to small postholes associated with the main structure’s porch and other postholes related to a possible outbuilding. Trenching also revealed a portion of the structure’s stratigraphy to analyze the layers of archaeological material before and during the destruction of the property. Archaeologists grouped material culture into architecture, fuel/energy, household/domestic, leisure/recreation, personal, subsistence, transportation, industrial, other, glass, worked glass, and Native American.

Archaeologists used these data to conduct analysis and research to understand ethnicity and gender issues of the time period, with a focus on room-use. They found that wire nails were used in construction at this site in 1887 (an earlier date than the initial use of wire nails in Colorado [1890]), few material culture indicating heavy-use of electricity in this neighborhood during this time period, and wild game faunal remains that suggest hunting, as well as remnants of domestic faunal remains from cheaper cuts of meat. This indicates the economic status of the people living in this area and provides data that can be used for future archaeological comparison between sites, such as any future sites at Highlands (Wood et al. 1999).

William J. Convery, III (1999) wrote a report on the utilities people used in this area for this project. Of particular interest to this background on Highlands is the gas, electricity, and tramways the public used located near the 20th Avenue Viaduct neighborhood. Convery mentioned the corruption and competition that led to varying prices of electricity and gas over the course of the 1890s, before ultimately increasing drastically at the turn of the 20th century. Even so, people in the 20th Avenue Viaduct community had access to gas and electricity. Meanwhile, tramways meandered throughout Denver and different suburbs, allowing for an increase in real estate value in relationship to cheap public transportation that started with the Denver Tramway Company (DTC) in 1886. Expanding utilities and tramways influenced suburbs such as Highlands and city growth (Convery 1999). Cheap transportation, gas, and electricity prompted new citizens to move to Highlands. Without these easily accessible resources, the suburb may have never increased in size from its lot-less land speculation of 1858.

Denver and Highlands

Denver's history is a storied one and includes a prehistory that archaeologists are still trying to decipher. Working in tandem with the rise of the Queen City of the Plains, the suburbs that contractors eventually built to capitalize on Westward Expansion and the expanding tramways allowed more varied communities to develop overtime. This could range from mansions or hotels on the plains to businesses built in response to the growing population centers around public transportation. Whoever these people were, they wanted to find a place to live around Denver close enough so they could travel to Colorado's

capitol city for business and pleasure but live outside much of the pollution and overcrowded portions of the city.

Highlands was one such suburb that has turned into one of Denver's many neighborhoods. While their history is storied by land transactions and speculations, and the passing of laws by the town's city council, the people's individual history is a little harder to discern. Highlands was envisioned as a utopia where upstanding citizens could live and ignore Denver. Of course, this ended in 1896 when Denver annexed Highlands. During Highlands' brief history as its own city, it would be interesting to know if and how the community followed these laws, how they acted with their neighbors, and if they, too, believed in this idea of becoming the Eden of the West.

I briefly analyzed possible methods archaeologists could utilize for minimally invasive archaeological work in Highlands that could contribute to the understanding of the local past in my report to Office of the State Archaeologist of Colorado (OSAC; Appendix E). In Chapters 4 and 5, I lay out the theories and methods, respectively, that I used to understand the present-day communities at Highlands Micro School and the History Colorado Center that interacted intergenerationally with archaeology.

Chapter 3: Amache Historical Background

During World War II, the United States government forcibly moved Japanese and Japanese Americans to ten different internment camps around the country (Figure 2). While under the guise of protection, this interment process forced thousands of citizens of Japanese ancestry into unconstitutional incarceration. Amache is one such internment camp located near Granada, Colorado. Its history extends from its construction in the southeastern Colorado plains to the current DU Amache Project that has focused on the historical archaeology of the camp and its inhabitants since 2008.

Amache and Japanese American Internment

Over 120,000 members of this community found themselves forced from their homes along the West Coast to internment camps. Internment started in 1942 but did not end until March 1946 when the United States government closed the final internment camp (JACL 2011). While the process of Japanese American internment took place during World War II, it is rooted in prejudice and racism that had started along the West Coast of the United States decades before the first internee boarded a train towards their assigned internment camp.

The Anti-Japanese Movements

In 1884, the Japanese Empire became laxer on immigration laws that prohibited working-age Japanese citizens from moving out of their country. Many took this as a chance to seek opportunity elsewhere, including in Hawaii and the United States. Japanese immigrants worked in cities along the West Coast, primarily finding employment in farming, with many able to take dry, poor soil and turn it into fertile land.



Figure 2: Map of all WRA Internment Camps and the West Coast Exclusion Zone. Courtesy of Anne Amati.

As the Japanese immigrants continued their hard work in the fields, shops, and fishing waters along the West Coast, white Americans felt threatened by them. When Japanese immigrants started to show “signs of initiative, they were perceived as threats to white dominance” (JACL 2011:4).

Over time, the majority-white American populace showed prejudiced tendencies towards Japanese immigrants and Japanese American descendants. Anti-Japanese campaigns led by white Americans supported the passing of anti-Japanese legislature, created legal denial of citizenship, and enacted segregation in public and federal institutions such as schools. Eventually, the United States government created a ban on Japanese immigration that was supported by prejudice, racism, and violence (Inada, ed. 2000; JACL 2011). This ban, the Immigration Act of 1924, was preceded by the Alien Land acts passed along the West Coast in order to halt the growth of Japanese landowners in the early 20th century (Harvey 2004).

During this time, Japanese immigrants started families. This allowed Japanese and Japanese American populations to slowly increase despite legal discrimination that often separated them into their own communities (Inada, ed. 2000; JACL 2011). Japanese immigrants did not disappear as many anti-Japanese supporters had hoped. Just as the Japanese and Japanese American populations stayed along the West Coast, so too did prejudice against them.

At the turn of the 20th century, anti-Japanese supporters used cultural outlets to create a myth known as the “Yellow Peril” all along the United States’ West Coast. This furthered discrimination against Japanese communities that made up a small fraction of the West Coast population. This myth stirred up fear and sentiments against these communities. Anti-Japanese supporters created newspapers, comic strips, and even movies to perpetuate this myth. Further segregation occurred as Japanese neighborhoods became more common. The majority-white American population retaliated against these

communities through discrimination and legal action. All they needed now was a reason to justify removing the Japanese communities from the West Coast. The reason they needed would happen during the course of World War II (JACL 2011).

From Discrimination to Legal Confinement

Although rooted in decades of anti-Japanese and anti-Asian prejudice, the internment of Japanese Americans was triggered by Pearl Harbor... the devastation at Pearl Harbor inflamed already pronounced resentment toward Japanese immigrant communities. Initiatives and legislation throughout the first four decades of the twentieth century had restricted or prohibited Japanese immigration, land ownership, and U.S. naturalization (Inada, ed. 2000:xi).

On December 7, 1941, the Japanese Empire attacked the United States in the coordinated surprise strike at the naval base in Pearl Harbor, Hawaii. While the United States government believed an attack from the Japanese Empire would occur and prepared for it by having FBI agents watch persons of interest of Japanese descent along the West Coast, they did not believe the attack would occur so soon or at Pearl Harbor (JACL 2011). Days after the initial attack, retaliatory articles and legislation came about in support of and against Japanese and Japanese Americans. Editorial articles by newspapers, such as the *Rafu Shimpo* – created in 1903 for Japanese readership – and *People's World* wrote articles against anti-Japanese sentiments (Inada 2000). The *Rafu Shimpo*, being related to Japanese communities, was shut down the day after Pearl Harbor was bombed. It reopened on December 9, 1941 but could only publish two English pages per issue. Due to this oppression of their freedom of speech, the newspaper officially shut down for the duration of World War II on April 4, 1942, “*with a parting editorial entitled “Itsuka mata omemoji no hi made” (“Until we meet again”) and signed “Before long, we will be your Rafu Shimpo again”* (Inada 2000:11-12, italics in original).

Although the *Rafu Shimpō* temporarily closed its doors, it played its part in supporting causes for Japanese and Japanese Americans, such as pushing for the United States government and other Americans to give these communities the chance to prove themselves loyal to the American cause. Further quoting the *Rafu Shimpō* from the December 20, 1941 edition, “Americans of Japanese ancestry, it has been assumed by our Caucasian countrymen, are willing to die for the United States. Yet many Americans are not too sure whether to trust us; they still have their doubts” (Inada 2000:13).

Unlike some groups in America, primarily the white majority, the Japanese and Japanese American communities were heavily distrusted, prohibiting their participation in early war efforts. They wanted to prove their allegiance, but racism and distrust moved the United States government to label members of the Japanese community as enemies and move them to assembly centers, and then one of ten internment camps

Some newspapers supported these government views. The *San Francisco Chronicle* wrote articles with headlines like “Japanazis or Japaryans,” titled by an anti-Japanese supporter attempting to connect Nazi Germany and the Japanese Empire (Inada 2000:15). Articles like these aimed to degrade Japanese communities and convince their readers that they were enemies of America during World War II. Eventually, these conflicting sides would come to a blow in 1942 when the United States government initiated the preliminary steps in the internment process.

The Internment Process and Living in Camp

In the early months of 1942, legislation and military orders worked against Japanese communities that had started to fight against the discrimination aimed at them and the

overarching view that they were enemy aliens. Executive Order (E.O.) 9066 signed by President Franklin D. Roosevelt took effect on February 19, 1942. While only giving military commanders the ability “to exclude any person from any area,” it was intentionally aimed at Japanese descendant populations along the West Coast (Bernstein et al. 1997, JACL 2011:8). General John L. DeWitt, Military Commander of the Western Defense Command, ensured that E.O. 9066 would be used in such a way.

General DeWitt enacted over one hundred military orders that applied solely to Japanese populations, even though military law had not been declared on the West Coast, nor had the writ of habeas corpus been suspended (Bernstein et al. 1997). General DeWitt still issued a decree that all Japanese and Japanese Americans must “leave the western half of West Coast states and the southern half of Arizona, and urged the affected people to move inland “voluntarily”” (JACL 2011:8). Even though some would fight against this decree, the United States government found no reason to stop the General, allowing him to continue.

President Roosevelt issued E.O. 9102 on March 18, 1942, establishing the War Relocation Authority (WRA) and ending voluntary evacuation, prompting forced evacuation of people of Japanese descent along the West Coast. Soon after, and in response to E.O. 9102, General DeWitt punctuated the end of voluntary evacuation on March 29, 1942 by issuing Public Proclamation No. 4 and ordered forced military evacuation of Japanese populations from the West Coast (Bernstein et al. 1997; JACL 2011). Members of these communities were forced to their closest assembly center in California, Arizona, Oregon, and Washington. These orders and regulations that preceded

them, such as curfews and movement restrictions, were only placed on Japanese and Japanese Americans, but not German Americans or Italian Americans. Furthermore, while claimed as military necessity on the West Coast, these affected populations did not face the same treatment in Hawaii or further inland. Unlike those living along the West Coast, Hawaiian Japanese communities and individuals were allowed “to remain free to help the islands’ economy” thanks to martial law (JACL 2011:10).

However, while martial law kept Hawaiian Japanese populations working and out of internment camps, Japanese communities along the West Coast started the long process of removal to one of fifteen assembly centers. Most of these centers were “county fairgrounds, race tracks, and livestock exhibit halls hastily converted into “detention camps” with barbed wire fences, search lights and guard towers” (JACL 2011:11). Many families had to sell belongings and homes for a fraction of what they cost or leave them in the care of often untrustworthy neighbors or entities. Business titles were lost, Japanese farmers could not harvest crops, and Japanese American homes were lost to banks due to an inability to pay mortgage, rent, or bills. As people tried to handle storage or selling of their possessions, they had to pack, too. It was a rushed process that occurred over the course of “maybe three weeks’ notice” (Iijima 2004:4), but sometimes in less than one week. Unsure of what to bring, even more unsure of the future, the Japanese communities moved to an unfamiliar place that did not welcome them.

Two of these assembly centers, Santa Anita and Merced, would house 23,500 individuals of Japanese ancestry, with some of them eventually transported to Amache, the Colorado internment camp. Merced housed 4,500 internees and was a county

fairground before being temporarily transformed into an assembly center. Santa Anita was the worst of these centers, with 19,000 internees living there temporarily. It was a retrofitted horse track that had temporary barracks and buildings made to accommodate those living there. Some living quarters were no better than transformed horse stables. While this may have been the case, internees made best with what they had. Farmers planted gardens, trying to liven Santa Anita, unsure if the seeds they planted would sprout before they left. This attitude would follow internees to the camps many would stay at for the next three years (Harvey 2004).

Meanwhile, the WRA, headed by Milton Eisenhower until June 1942 (he stepped down for personal reasons related to the mass-incarceration of thousands of people) and by Dillion Myer from June 1942 onward, took charge of the problems and logistics involved with forcibly moving so many people from their homes. The WRA handled the movement of families, children, the elderly, men, and women to the assembly centers, before transferring them to one of the ten permanent internment camps (Bernstein, et al. 1997; Harvey 2004; JACL 2011).

Internment camps, called “relocation camps” by the WRA (Hohri 2000:395), were quickly erected across the United States with many being built in the summer of 1942, and relocation occurring as soon as they were constructed (Harvey 2004). These hastily constructed camps had barbed wire fences, guard towers, guards manning them, and were built away from key military or population centers. Over the course of their occupation, guards would shoot and injure dozens of internees, eventually killing eight (JACL 2011).

Internees lived in barrack units, the largest of which was just 20x24 feet, where they were crowded in together with no privacy within units and little between them. To help make a home out of their camps, many internees cultivated gardens (Clark 2017a) and used scrap to make furniture and additions to the original barracks. Due to this lack of privacy, the familial importance common amongst Japanese and Japanese Americans barely existed; under the ‘protection of the state,’ heads of households (mostly males) did not make the primary income and children saw little control from their parents, as they often preferred mealtimes with their friends at their local mess halls. Meanwhile, pregnant women, sick patients, and elderly men and women were forced to seek medical care from underpaid, overworked staff at on-camp hospitals and health centers (JACL 2011; Ota 2000; Yamamoto 2000).

Unfair treatment did not end there. In 1943, the United States government thought to create the all-*Nisei* 100th/442nd Regiment Combat Teams, allowing Japanese American internees to serve in the armed forces (Roosevelt 2000). However, to determine eligibility, the United States government issued the Loyalty Questionnaire to all Japanese American internees to determine where their loyalties lay. Two questions in this questionnaire were troublesome for some people to answer: Questions 27 and 28.

Question 27 asked, “Are you willing to serve in the armed forces of the United States, wherever ordered?”; Question 28 asked,

Will you swear unqualified allegiance to the United States of America and faithfully defend the United States from any or all attacks by foreign or domestic forces, and forswear any form of allegiance or obedience to the Japanese emperor, or any other foreign government, power, or organization?” (JACL 2011:109).

Internees found these questions rightfully confusing. The Commission on Wartime Relocation and Internment of Civilians referenced these issues, stating that the questionnaires “demanded a personal expression of position from each evacuee” and “left little room to express [their] ambiguity” (Bernstein, et al. 1997:13-14).

Although those who vocally fought against internment existed, a vast majority of draft age Japanese American men answered “yes-yes,” allowing them to serve in the armed forces in some capacity. For some, this was what they had wanted since the start of General DeWitt’s orders, the passing of E.O. 9066 and 9102, and even before then. Many members of these communities shared this view and wanted to prove themselves as American as their fellow American. Alongside the combat regiments, the Military Intelligence Service (MIS) enlisted Japanese language specialists (especially those of Japanese descent) to help in decoding Japanese military messages; however, these men and women, and Japanese American servicemen in the Pacific Theater before 1943 were not made public knowledge (JACL 2011; Roosevelt 2000).

Meanwhile, as this happened, the United States government forced family members of fighting servicemen and women to stay in their respective internment camps. This included those at the Granada Relocation Center in Colorado, also known as the Amache Internment Camp.

Granada, Colorado and Amache

Colorado, in the 1930s and 1940s during the rise of anti-Japanese sentiments along the West Coast, served as a safer state. Many Japanese and Japanese Americans moved to Colorado during the voluntary evacuation period, “because of the state’s reputation for

accepting people of Japanese ancestry” (Harvey 2004:30). However, this voluntary evacuation period was still hard on evacuees. They had to pack up everything they had, or what they could, and move to the interior United States. Some could ask friends for jobs or temporary places to live in Colorado. At the time, the Japanese American population in the state totaled around 2,000 before it tripled to 6,000 after 4,000 moved there after 1943 when the WRA initiated a relocation program that encouraged eligible internees to leave their camps (Hosokawa 2005).

As the WRA started the forced evacuation process amongst Japanese communities along the West Coast, the then-head Eisenhower initiated conversations with governors from different states that might be willing to house these people. Out of the ten western state governors that discussed evacuating these communities to interior states with Eisenhower, Governor Ralph Carr of Colorado was the only one to state that “aiding evacuees was the civic responsibility of American citizens” (Harvey 2004:36; Hosowaka 2005). This led to the nine other states to declare that they would not accept evacuees unless they were in “concentration camps” (Hosokawa 2005). In response to Governor Carr, the governor of Wyoming, Nels Smith, stated, “If you bring Japanese into my state, I promise they will be hanging from every tree” (Hosokawa 2005:90). Responses like this forced Eisenhower to concede and agree to the governors’ demands. Camp construction would commence the following summer in 1942 and internees would arrive at one of ten internment camps that same year.

While Governor Carr supported the initiative to move Japanese and Japanese Americans to interior states, even welcoming them in to Colorado and defending them by

stating that they “are as loyal to American institutions as you and I” (Harvey 2004:53), he did so out of an obligation to wartime America. Governor Carr asked immigrants of Axis-power ancestry to claim new identity cards and move away from areas where fifth-column activities could harm the United States. He believed Japanese Americans to be loyal Americans like any other, but felt he had to fulfil his duty to the American government at the same time. He also believed that every man deserved to be tried with evidence, as stated by the Constitution, before being found guilty of a crime. Whether for different reasons than many believed or defending the inalienable rights guaranteed to American citizens, Governor Carr did what he thought was right and became an ally of the *Issei* and *Nisei*. Those of Japanese descent who had moved to Colorado before the internment process still faced bigotry and hate from the state’s residents – even after Governor Carr’s declaration (Harvey 2004; Hosokawa 2005).

Because of Governor Carr’s stated obligation, the WRA started searching for a suitable location for the Colorado internment camp. Eventually, on June 3, 1942, it was announced to the public that the WRA internment camp would be built near Granada using land from the XY Ranch, Koen Ranch, and “twelve smaller private holdings,” making it the only internment camp wholly located on private lands (Harvey 2004:60-61). Named the Granada Relocation Center by the WRA, this internment camp would also be known by its nickname, “Amache,” based on the camp’s postal designation (Burton et al. 2002).

The decision to choose this area resulted from the labor shortage common in the World War II wartime economy and after the Great Depression. The WRA hoped that

internees could be hired to grow food, even though they had wanted to also use the camp location as an industrial site. Labor was sorely needed in farms in the surrounding agricultural towns of Granada, Lamar, Holly, and Wiley due to the wartime economy and economic depression. Construction of the camp began on June 29, 1942 with a completion date of August 31 that same year (Harvey 2004).

Once construction had finished on the internment camps, the WRA assigned families and individuals to different locations. Amache would be the destination for roughly 10,000 Japanese and Japanese American internees during its use from 1942 to 1945. Amache rose from the Colorado plains like a small city within a prison-like facility, boasting a fire department, police station, and hospital over the course of its occupation. The site had schools for children and organizations like the Boy Scouts of America, clubs, and a YMCA. Before the end of its time, Amache would become the tenth largest city in the state (Burton et al. 2002; Harvey 2004).

But while these words describe Amache as any other American town, it was anything but. The youth and adults brought to Amache would earn scars and wounds from their time there, with many knowing full-well that they were not being protected from their fellow Americans. After all, the guards and spotlights pointed inwards towards internees, not outwards. The American government took liberties away from internees at camps such as Amache. Even so, many internees lived by the phrase “shikata ga nai” (“it cannot be helped”) and several believed in rolling with the punches, forced to make the best of a situation that had been designed by their own government to imprison them (Harvey 2004; Inada, ed. 2000).

Internees “were expected to accept low salaries to build and maintain their own prison – and to do so in a far better fashion than the average citizen” (Harvey 2004:122). This included working on agricultural projects, cultivating gardens that provided shade, produce, and scenery, and manning stations at posts such as fire departments, police departments, and hospitals for a fraction of normal pay (the maximum pay for these latter individuals at Amache was \$19 per month, the highest the WRA paid any internee).

Many internees at Amache were excellent farmers. Thousands came from farms in California, having learned how to till the land there and create productive farms out of less-than-desirable land. They brought this knowledge with them to Amache. The WRA employed internees in an extensive farming program that included cultivating vegetables and fruits, raising cattle, poultry, and hogs, and even getting high school students involved in learning about farming as a profession. The ability to farm at Amache had some advantages, such as an irrigation system and previously constructed farming facilities (Hosokawa 2005) which covered 10 square miles surrounding the central 1-mile guarded central camp.

At Amache, some internees were allowed work passes to work on fields outside the internment camp and associated agricultural facilities. These Amacheans served as farmhands to the local farmers and ranchers, as well as agricultural enterprises across the state. Some farmers, who scoffed at the farming techniques Japanese internees used inside and outside Amache, found themselves astounded at the yield that these farmers could create; Amacheans produced more than 3,838,600 pounds of vegetables at Amache alone (Harvey 2004). Internees also impressed local farmers with the different kinds of

crops they could produce. With help from Japanese farming techniques, Amache and Coloradan farms located around the camp could produce crops such as “hay, alfalfa, barley, sorghum, pyrethrum, potatoes, lima beans, spinach, and sugar beets. Even celery – a crop never before produced in southeastern Colorado – was grown successfully by evacuees” (Harvey 2004:124). They accomplished all of this in the high plains of southeastern Colorado, all with less than 200 internees employed as farmers or farmhands.

Other services and jobs existed in Amache, of course. The WRA intended for the internment camps to be as self-sufficient as possible. Doctors worked at hospitals, and men worked and volunteered as fire fighters or policemen that served under white officers (Harvey 2004:96). The mess halls required cooks and servers to provide meals for, when at maximum population, over 7,000 internees at Amache. Administration buildings needed staff, schools required teachers, and community centers, YMCAs, and community programs needed people to head classes or provide guidance in sports, recreation, and other activities. Newspapers reported local and outside news to Amache under the supervision of camp editors to ensure internee journalists kept within the camp’s news reporting rules. All the while, children attended school. The high school at Amache, at the time, was the most expensive building constructed in Prowers County. This earned ire from several members of the local populace who did not approve of such funding for internment camps (Harvey 2004; Hosokawa 2005). Again, all this information paints Amache as an American town with American people living American lives. Yet, being treated as a prisoner in one’s own country, eating meals that did not

meet nutrition requirements, receiving improper medical care, and being paid much less than the average American were all harsh realities internees faced on a daily basis.

In 1943, the WRA and United States government encouraged approved internees to leave Amache and seek a new place to live, as well as employment, elsewhere in the state. While some internees moved to Denver to start new businesses or obtain land for farming, some stayed in Granada, such as Frank Tsuchiya, who opened a Japanese fresh fish market in the small town. Using his pre-war contacts from the West Coast, Tsuchiya brought in fish, namely specializing in *sashimi* for sushi, to sell to locals and internees (Harvey 2004; Hosokawa 2005). Although some internees and members of the Japanese community found some form of acceptance close to and far away from Amache, that was not always the case.

Statewide and nationwide discrimination still existed thanks to wartime and pre-wartime prejudices developed by some of the American populace, like Jack Carberry who attacked internees with a falsified and biased series of articles made to justify America's view of people of Japanese descent. Besides biased journalism, vandalism occurred on properties connected to Amache's internees. In California, the Nichiren Church and similar Japanese-owned properties were ransacked and vandalized by people who held negative views of the Japanese population (Harvey 2004).

Coloradans tried to retaliate against Japanese communities in 1944 after residents in Adams County, north of Denver, were alarmed by the evacuees and former internees working on farms, starting businesses, and buying land, going so far as to call it a crisis. Of course, it was not, but that did not stop Coloradans from pushing for statewide

legislature to address this so-called problem. Thus, in the 1944 state election, the Colorado Anti-Alien Land Law, based on a similar law passed in California, aimed to prevent foreigners from owning land in the state, including businesses and farmland (Harvey 2004; Hosokawa 2005). However, this law was not voted into effect, as a narrow margin of Coloradan voters voted against it. Problems outside Amache existed, but so did problems inside.

Amache faced harsh conditions that would try any person. Low salaries were just the start of the issues internees faced. Some of the meals served at camp had low nutrition values and included primarily starchy staples, spam, and cottage cheese. Health checks were hindered by the under and poorly staffed hospitals at the camp, where doctors worked past 24-hour shifts to tend to their patients. In the fall of 1943, a polio epidemic spread throughout Amache, infecting 170 internees and forcing the WRA to issue a quarantine that halted outside passes. Finally, the weather was harsh, with blistering summers with little shade, and freezing winters with billowing winds that snuck through cracks in barracks to chill internees to the bone (Harvey 2004). Different trials plagued the internees at Amache, with issue after issue presenting itself in the form of a new challenge. Yet through it all, attitudes like *shikata ga nai* helped Amacheans press onward.

Unsurprisingly, when thinking of the farmers and gardeners that made it to Amache, this attitude of rolling with the punches manifested itself in one of the seemingly smaller, yet most impactful, of practices within the camp: gardening.

Gardens and Community Gardening at Amache

Gardening provides the ability to change one's surroundings by molding the natural environment to fit one's needs and wants. This can result in a distinct shifting of place and how people view it. It allows people to make it their own and place a sense of familiarity within an otherwise alien landscape. By 1934, before internment, 43% of the Japanese descendant population along the West Coast were employed in agriculture (Helphand 2006). With the WRA and United States government pushing Japanese descendant farmers and gardeners from their greener homes in California to the vast, high plains of southeastern Colorado, this sense of unfamiliarity manifested itself even more in their day-to-day lives. So, using what they had learned over their careers in growing plants and crops, interned farmers and gardeners plied their skills outside of farming and used them to change Amache.

The Amache gardens were always supposed to be temporary. Even though internees knew that, it was still critical that they create a place for themselves that “helped alleviate the oppressiveness and indignity of the [internment process]” (Helphand 2006:164). Through collaborative efforts with internees and descendants, and with palynologists, scientists who study pollen, archaeologists have been able to determine the kinds of plants gardeners planted at Amache. They cultivated victory gardens with a range of crops including Chinese cabbage, *habucha* (an Asian tea plant), mung beans, and daikons (Harvey 2004). Outside of edible produce, gardeners also grew ornamental plants, such as cockscomb, globe amaranth, and even members of the rose family (Haas and Starke 2017; Jones 2017). Interned gardeners even incorporated native plants like redwhisker

clammyweed, plants from the legume and bean family, cholla (a type of cactus), and *Liguliflorae* (dandelion type) into their gardens (Clark 2017b; Haas and Starke 2017; Jones 2017). Finally, interned gardeners planted trees in specific patterns or spots to create instances of shade and protect internees from the harsh late spring and summer sun.

Different gardens served different purposes. Entry (or entryway) gardens are traditional Japanese yard gardens that link “household to community to function as entry and marker, displaying the craft and skill of the resident and embellishing both the barracks and the community space” (Helphand 2006:167). These entry gardens served as ways for people to interact with community members (Clark 2017b; Figure 3). Gardeners also created recreational spaces “between barracks, community parks, and gardens at mess halls and in firebreaks”. This led to the cultivation of fields, which some were eventually “appropriated as gardens and picnic sites” (Helphand 2006:165-166).

Internees were creative with how they grew their gardens, and some people may ask how they could grow anything in the Colorado high plains. Working with those around them and within their block, gardeners slowly turned the barren dirt into fertile soil. They added fertilizers and soil amendments such as eggshell, tea leaves, coffee grounds, and iron clinker that helped improve the soil’s health and changed the landscape around them. These techniques eventually bore fruit in the form of edible vegetables and scenic flowers (Clark 2017a).

In cultivating these gardens, many gardeners gathered materials from dump areas and locations outside Amache, such as riverbeds to accentuate and add decorative features to

their gardens (Clark 2017a). By adding these decorative features, the interned gardeners would construct landscapes such as dry gardens, which would center around creating a facsimile of different environs, such as an ocean represented by river cobble and islands represented by concrete blocks. However, these supplies were hard to come by and gardeners needed to use them carefully (Helphand 2006). Yet these gardens created a sense of place for Amacheans and involved the community in working and enjoying them.



Figure 3: Mataji Umeda with his garden at Amache. Courtesy of Helen Yagi Sekikawa, his granddaughter.

Creating these landscapes required work from many members of the community, not just gardeners. Clark (2017b) describes these networks that helped gardeners access materials needed to create and cultivate different gardens. Internees used the different relationships they had within “the larger physical and social environment” (Clark 2017b:30) such as those with access to scraps from the mess hall or materials otherwise

bound for the dump. Internees connected to the landscape around them by gathering local plants and materials for their gardens. Gardeners also added soil amendments to supply nutrients to their gardens, which required social engagement with those around them. This common goal of gardening promoted working together as a community.

Fostering this sense of community was another important product that came from internees cultivating these gardens. Children worked with gardeners to help create these temporary landscapes. Internees worked with each other to provide the necessary supplies to grow and accentuate these garden spaces. Agriculturalists started clubs, promoted cultivating gardens and farming, and constructed play places for the younger generation. Gardeners used their knowledge of agriculture to craft a new landscape in place of the high plains to which the WRA had originally transferred internees (Clark 2017b; Helphand 2006). Gardeners used the gardens to create places of embodied memory and claimed territory, “even if briefly, [providing] a... sense of belonging” (Clark 2017a:88).

Yet, it is safe to say that these gardens did more than just create a place *then*; they still impact the landscape of Amache *now*. After the internees left, and the WRA disassembled Amache, the plants in the camp continued to grow. Trees that gardeners had planted for shade still greet those who visit Granada and the internment camp. In one area, even rose bushes grow along the concrete foundations left behind (Figure 4). Amache visitors can still see little instances of lived memory represented through the way internees interacted and changed the landscape, even after internment had ended.



Figure 4: Rugosa roses growing along the old foundation of an Amache barrack Summer 2016; Photo courtesy of the DU Amache Project

Returning Home

Along the West Coast, by fall of 1943, some Caucasians fought anti-Japanese resentment that had pushed for evacuation and internment in the first place. People even created anti-evacuation groups and committees dedicated to helping prove Japanese American loyalty and innocence (Harvey 2004). While this may have been the case, discrimination towards anyone of Japanese heritage still existed along the West Coast. The United States government, meanwhile, had not ended the internment process, still seeing internees as possibly dangerous aliens – even if they were Japanese *American*. It was not until December 17, 1944, with the passing of Public Proclamation No. 21, that the WRA made the Announcement of Rescission, starting the end of the internment process and camps (Harvey 2004).

After nearly three years of internment, it would finally end. However, this required several months of logistical planning and it was in early 1945 when “Myer... announced that all relocation centers would be closed by the end of 1945” (Harvey 2004:186). Amache’s internees had until October 1945 to leave the camp. Despite Myer’s hope for a swift closure, internment did not fully come to an end until the Tule Lake Internment Camp closed on March 20, 1946. Even though internment would finally end, many internees had mixed feelings about leaving the internment camps (Harvey 2004).

Some internees could not wait to return to their homes along the West Coast, while others knew the effects of racial discrimination and were unsure of what to expect when they left to return to a home the United States government had torn away from them. Some states even resisted the process, not allowing internees to settle in their towns and prohibiting their employment. Some states welcomed these communities, following the WRA’s attempts to push internees to move to areas outside of the internment camps in 1943, with hostels appearing in cities such as Denver and Chicago (Harvey 2004). Unsure of how they would be treated, internees’ fears and feelings of uncertainty were not unfounded.

“Concerns about property protecting and governmental responsibility were proven justified” (Harvey 2004:189). Internees came home to damaged property and stolen belongings. Law enforcement along the West Coast and in California made little effort to work towards a resolution and reparations for the internees as they returned home. Even though the public started developing a more positive perception of Japanese descendant populations along the West Coast, some ignored letters and cries of protest from officials

protecting those returning home. Vandalism and domestic terrorism greeted some Japanese and Japanese Americans deciding to return home to West Coast states. Many of these racial barriers would not start to disappear until the 1950s and 1960s.

Soon after the war ended, internees came together in their small communities, recreating or creating local Japanese American Citizens League (JACL) chapters. This included Denver, where many internees had questions about the uncertain future, ultimately asking: what would be the fate of Japanese and Japanese Americans? The local JACL chapter in Denver decided to hold a meeting to address some of these questions. Saburo Kido, the chapter's wartime president, organized this JACL meeting where members met from February 28 to March 4, 1946. There, the chapter, headed by Kido, wrote up a fourteen-point postwar agenda of goals they wanted to meet. Several of these goals focused on reparations for the affected communities, returning of citizenship rights to all affected peoples, keeping the history of internment present in America's eyes, and helping those in their affected communities, both internees and veterans, in adjusting to life outside of camps and war (Hosokawa 2005). Today, this same JACL chapter is now known as the Mile High JACL chapter.

These JACL chapters and national meetings would impact future legislature that revolved around immigration and minority populations, such as Japanese descendants. In 1952, Congress passed the Walter-McCarran Immigration and Naturalization Act, thanks in part to Japanese American lobbying. This act "repealed the Asian Exclusion Act of 1924 and extended to Japan and other Asian countries a token immigration quota. It also eliminated race as a bar to naturalization" (Hosokawa 2005:237-238). Now that the

immigration acts had been repealed, Japanese immigrants started to immigrate to the United States under the generational name *Shin-Issei* (New Issei).

Eighteen years later, in 1970, Edison Uno would approach the JACL with an idea to address the scars and grief that served as reminders from the internment process. Uno suggested seeking redress from the United States government. This started a long process that would continue with President Gerald R. Ford's nationwide apology to all internees affected by the period of internment on February 19, 1976 and signing a proclamation entitled "An American Promise" that rescinded E.O. 9066 (Harvey 2004; JACL 2011). Almost ten years after Uno's suggestion, Representative Mike Lowry of Washington proposed a bill to legalize this process. Thanks to him, many others, and the National Council of Japanese American Redress (NCJAR), Congress would pass this bill to establish the Commission of Wartime Relocation and Internment of Civilians in 1979 (Bernstein et al. 1997; Harvey 2004).

In 1983, the commission would present their findings to the United States government. They would reach their conclusion after reviewing economic losses, social obstruction, and political discrimination during wartime hysteria (Bernstein et al. 1997). Five years later, Congress finally passed legislation based on the Commission's findings and the history of the internment process. This piece of legislation, the Civil Liberties Act, was passed by Congress before President Ronald Reagan signed it in 1988. It included reparations of \$20,000 and presidential apologies for all those affected by the internment process. In 1990, President George Bush presented the first letters of apologies and redress checks to the oldest internees (Harvey 2004; JACL 2011).

To this day, internees remember what happened when war hit the United States and their government took away their rights. Descendants of internees are sometimes told stories about their past, while others choose not to talk about it. In 2003, Congressman Mike Honda, a California Democrat, introduced a resolution that would mark February 19 as the National Day of Remembrance – the same date in 1942 when Roosevelt signed E.O. 9066 into law, starting the internment process. As reported by the *Pacific Citizen*, the weekly JACL publication, “Congressman Honda’s resolution would set aside February 19 as the occasion to remember a nation’s shame as it sent some of its citizens, on the basis of their race, into exile” (Hosokawa 2005:242-243). The United States and former internees acknowledge the Day of Remembrance, so that stripping people of their rights and imprisoning them based on suspicions may never happen again.

The Day of Remembrance is just one way people face this past. Since 2008, the DU Amache Project has led archaeological field schools and research into internment at Amache. Bonnie Clark leads this program and has created outreach with the Japanese American and Amache communities to seek their voice and experience on internment. Clark’s research has promoted community outreach to Amache internees and their descendants, local residents, and the descendants of camp workers. The goal is to include all who were affected in this project. Gardens and community cohesion have been particular areas of research. While primarily an archaeological and museum management project, the opportunity to understand community perspectives and histories has presented itself. This opportunity creates a chance for internees to share their personal and reflective histories with Clark, the Amache Project, students, the United States, and

with themselves and their families (Clark 2017a, 2017b; Haas and Starke 2017).

Internees' voices bring a particular perspective that cannot just be gleaned through the archaeological record. The Amache Project helps to bring together the community to face their history and present it to others.

Archaeologists working with the Amache Project have focused on gardens, including the specialized analyses of archaeobotany and palynology. Those studies begin with taking soil samples from excavation units that archaeologists believed were past gardens. Palynologists retrieve pollen remains from these soil samples, and the project archaeobotanist identifies macrobotanical remains like seeds. Both specialists analyze these remains to determine what internees may have planted within different gardens (Haas and Starke 2017; Jones 2017). Combining internee's oral histories and photographs with this archaeobotanical, palynological, and archaeological data, archaeologists can determine how gardeners impacted the landscape around them. These data then provide views into the ways internees changed Amache and how these gardens impacted the social environment (Clark 2017a, 2017b; Helphand 2006). Archaeologists are then able to see the community ties created through these gardens and how important having control of their place was to internees.

While these opportunities for facing the past have occurred, whether archaeological studies or presidential apologies, they cannot fix what happened. This dark period of American history will always, and should always, be remembered so that it is not repeated again. Internees and their descendants will never forget what happened at these ten internment camps.

Chapter 4: Theoretical Framework

When discussing education in public archaeology, I had to consider how different communities would view the archaeology they would interact with and the way they learned through said interaction. I realized my research on intergenerational education would have to rely on theories that considered how participants understood the archaeological record and the way in which they learned through this process.

I considered two of the more important archaeological aspects participants would interact with: place and material. Place indicates where participants learned about archaeology and how it is connected to them. This includes place-based education (Mannion and Adey 2011). How participants view the material culture is also important. The material culture is something many students had interacted with at Highlands Micro School before I became involved with them. Teaching students, parents, and teachers to understand the importance of archaeological stewardship and how these objects create a view of the past helps shape how they comprehend these ideas. Both place and landscape theory and the theory of materiality are intrinsically connected to how participants learned. Experience can be considered the greatest teacher when considering these hands-on learning opportunities.

David Kolb (2015) best summarizes this idea of experiential learning as using hands-on experiences as the “source of personal learning and development.” This theory works closely with my thesis research. Experience is key when teaching archaeology. Interactions with the archaeological record of one’s community allows participants to develop their own learning and what they want to take away from what they are taught. This is exemplified in participants developing their own ideas about the past and their own ideas about place while working together intergenerationally. In this chapter, I will summarize the anthropological and educational theories that drove my research and how they are connected to my thesis.

Place and Landscape Theory

Barbara Bender defined place and landscape as “‘the world out there’ as understood, experienced, and engaged with through human consciousness and active involvement” and that “[t]he same place at the same moment will be experienced differently by different people” (Bender 2006:303). The purpose of place and landscape theory is to understand the ways in which different peoples may view a landscape, whether natural or cultural. In anthropology, researchers can interview members of a community or interact with them through observation to understand a certain cultural perception of place. Archaeologists use different methods to determine the use of space, even going as far as to define cultural landscapes to denote the use of an area by different past peoples. Place and people are closely intertwined, even in learning.

Place plays a factor in education. Students learn in a classroom; adults invest in hobbies. Different landscapes offer different opportunities to experience the world

through learning. Place-based education (PBE) works together with place and landscape theory in my thesis. Mannion and Adey (2011) conducted research on environmental education to provide an example of intergenerational learning in a PBE setting. They argue four points in their research:

...we posit that place-based education is inherently intergenerational and involves (a) people from more than one generation participating in a common place-focused activity; (b) different interests across the generations... through tackling some problem or engaging in an experiment; (c) a willingness to communicate across generational divides (through activities involving consensus, conflict or cooperation) with the hope of generating and sharing new intergenerational meanings, practices and places that are held in common; and (d) a willingness to be responsive to what the world throws back at us when we try things (Mannion and Adey 2011:40).

By conducting this research, they want to understand intergenerational education through PBE, stating that place affects intergenerational learning. This is exemplified in my research through the use of two different sites where participants interacted with archaeology. I want to see if place impacts adult and child participants' learning opportunities between the two research sites.

I have briefly touched on the relationship place and landscape have to my thesis, but I want to expand upon that here. My research occurred in two separate locations: Highlands Micro School and the History Colorado Center. These research sites can be defined as a formal education locale and a public/extracurricular education locale, respectively. Understanding these differences already creates a divide between the research sites. However, I would venture even further to say that a key difference lies in the participants.

Educational programs at the sites were different, catered to several different factors that included time, resources, site location, and the participant population. The Highlands Micro School participant population included the cooperation of students and parents involved in an educational program. The exhibit at the History Colorado Center catered to a mixed population of advocational enthusiasts, curious children, and families learning about their state's history together. Each place created a different environment that advertised itself to different publics. Acknowledging these varied places and participant populations is important for noting differences that can occur in intergenerational education.

If I am to view this research through an archaeological lens, then I can also see a difference occurring there, primarily amongst the communities involved. The Amache Exhibit caters to a population of museumgoers and visitors, most of them not intrinsically associated with the closer Japanese American community that identifies with Amache. However, this exhibit still belongs to another community – the broader Colorado community. It is a past that the audience should understand makes up the state's history.

The archaeology at Highlands Micro School provides a more personal connection to a shared community past. Parents, students, and teachers all have a common bond to the Highlands area and the school by having a relationship with their place of education. Having this relationship makes learning about the archaeological record and past at Highlands Micro School a community-based experience. This relationship has the opportunity to create meaningful, direct connections between participants and their

school's past. Through intergenerational learning, participants can "re-think their relationship to their community" (Mannion and Adey 2011:38).

I had to consider how place may impact the way people learn in my research. Place is unique to an individual. While this can apply to older or more traditional locations, it also applies to modern-day areas. People will always experience a place differently; it is part of what makes human experiences so unique. Using this theoretical perspective, I also needed to consider how the different generations viewed their interactions with place. Differences in generational perspective of present and past landscapes can change their view on the archaeology. As Bender (2006:305) summarizes it, "different people, differently placed, 'see' things differently." I needed to consider these different interpretations if I was to understand how participants came together to use archaeology to impact their own personal perceptions of the field.

Place and landscape must also be considered from points-of-view (objective versus subjective; insider versus outsider). "People's delineation and understanding of landscape owe a great deal to the particular historical, social and political contexts in which they themselves live and work" (Bender 2006:305). Where a person finds themselves at a time or place must also include their original biases or personal thoughts as they engage with the landscape. This includes whether or not they are connected to said place. In the case of Highlands Micro School, the learning community is connected to the small school that encompasses a big part of their lives. Therefore, they will have previous knowledge of the location, personal connections to all that is happening, and an unabashedly, unapologetically (nor should participants apologize for it) subjective point-of-view that

cannot be separated into the objective. Before I became involved, this community already had strong connections to the archaeological record and the school's past, emphasizing my role as an outsider. I had to consider how this connection could impact the way I worked with the school and the attitudes they may show towards their local archaeology.

At the History Colorado Center, people are tied to place through my research in two different ways: first, they are in a public space where other visitors can see their actions as they learn about Colorado's history; and second, the Amache Garden Archaeology Exhibit they interacted with aimed to take them to a past place. Unlike Highlands Micro School, most people viewed this exhibit through an objective viewpoint. Of course, former Amache or Japanese American internees would be able to place themselves within this historical past, however, I do not believe any former internees visited the exhibit during its short research time. Although that was the case, relatives or friends of internees interacted with the exhibit at different points. They have previous knowledge of the event and the camp, as well as a connection to it. Some visitors had a connection to the exhibit, but most did not, making it less personal and less community oriented.

Place plays an important role in my thesis research. People interact with their surroundings differently and the various factors listed above are a glimpse at the theoretical perceptions participants encountered as I worked with and alongside them. This interaction is where a subject known as the 'pragmatic imagination' (Alexander 1990; Gómez and Clark 2018) comes into play. Alexander (1990:341) describes the pragmatic imagination "as a mode of action and as such seeks to organize experience so it anticipates the world in a manner that is meaningful and satisfying." This concept is

key for participants in reading the material culture of Highlands Micro School's past or filling in the blanks the map at the Amache Garden Archaeology Exhibit leaves for interpretation. The pragmatic imagination brings about what is already previously known by the interpreter so that they may apply it to what they are seeing in the present. For example, the map visitors interacted with at the Amache Garden Archaeology Exhibit is an imitation of an archaeological unit for the History Colorado Center visitors to explore rather than just an oversized piece of paper with a drawing on it.

The pragmatic imagination is connected to both place and material in my thesis research. For that reason, pragmatic imagination is not its own theoretical framework, but rather one that influences two different theoretical frameworks. My explanation on place and landscape theory has described where pragmatic imagination lies within it, but it must also be touched on in relation to people's interaction with the material aspect of archaeology.

Materiality

The pragmatic imagination is a person's ability to "fill-in-the-blanks." People draw on past experience and know or believe what to expect in their minds when they see something through place or material (Alexander 1990). In other words, "[i]t provides a framework for unpacking imagination as a wide range of human mental activities that are placed into action" (Gómez and Clark 2018). Place and landscape become good examples for applying the pragmatic imagination, but materiality provides an instance where people can use their pragmatic imagination while interacting with tangible objects.

Timothy Taylor (2006:297; 298) defines materiality as an anthropological theory: it allows people to engage “with the unavoidable qualities of a material, such as the particular type of stone found in the construction of a prehistoric tomb, or the way in which a corpse decomposes in a particular climate... [object qualities] from which metaphysical categories can be abstracted.” Materiality looks past the physical aspects of an object to better understand its meaning to different peoples, the qualities imbued within an object, and how a temporally or culturally different viewpoint can change one’s understanding of said object.

The subject matter that the theory of materiality covers is broad, and it has been embraced by many fields. Within archaeology it is often employed to focus on the why and how a past person or culture may have viewed these objects. In my research, however, I take a different approach and establish the use of materiality in the present. Specifically, I consider the ways in which people in the present who are not archaeologists might view the past through their interactions and educational engagement with material culture. The public perception of the material culture is crucial to understanding changing attitudes towards archaeology in this research.

Official and unofficial terminology for material culture are used almost interchangeably by the public. Changing the public perception on correct terminology may be important but working with different publics should not start on correcting. Instead, education should take what the public knows about these objects and engage them with ideas about archaeological stewardship, preservation, conservation, access,

protection, legal and ethical considerations, and proper terminology. However, the question remains as to where the balance lies between interest and education;

[h]ow important is it to maintain public interest in archaeology, and at what point does one compromise on data presentation, vocabulary selection, and argumentation to keep that attention?... Looking forward, the challenge is to keep and develop this interest while maintaining the public resource” (Wallace 2008:378).

This challenge tends to show itself frequently when the public interacts with the archaeological record, especially locally. Local archaeology can help demystify the field through the material culture, specifically considering “if one identifies with the past personally, there is something intrinsically tempting in the goodies beneath or on the surface” (Wallace 2008:380). Public perception focuses heavily on what they or archaeologists may find in the archaeological record. Past made tangible is something quite enticing to most anyone, including the archaeologist. Working upon that viewpoint of the past or the culture made manifest through an object in one form or another is critical to working with a public audience, especially if such outreach relates to the local or community levels.

From the moment I first met with Ms. Sara Rove’s eager class of 12 students in 2018 at the University of Denver (DU), I could sense their enthusiasm for understanding their school’s past through material culture. At the end of their tour at DU’s Department of Anthropology, Ms. Rove and her students showed Bonnie Clark, Brian Brunst, and me what they had found during their excavation. While the material was important, seeing how they happily showcased their objects and learned history of Highlands made me think of children presenting their favorite toy at show-and-tell. They all wanted to provide little bits of information or expand upon what their teacher, student, or classmate

explained to us. They all had their own views on the objects they presented. Their different views of the material culture showed us their seriousness in learning about their school's past and archaeology, but it also indicated that we, as archaeologists, should engage with them through a public educational experience. Understanding their fascination with the school's material culture and using that fascination to expand upon their perceptions of these objects in relation to their school's past *is* crucial.

I wanted to engage this community in caring for the past and fostering a sense of archaeological stewardship through the school's uncovered archaeological record. Unfortunately, I could not use similar resources at the History Colorado Center. This research site required a different approach to public interaction with archaeology.

The Amache Entryway Garden Exhibit utilized a different type of materiality-driven interactive experience. Visitors at the History Colorado Center interacted with the exhibit by using a worksheet that incorporated the interpretation of an excavation unit from the 2014 DU Amache Project Field School (Appendix D). While the interactive experience did not use the actual unit itself, it was a near-to-scale map that depicted a colored and interpreted plan map of the unit. This map served as an analogous space, which Susanne Küchler (2005) describes as a thing that can be designed in a space and interprets a meaning to those that interact with it. Participants and visitors saw the map and knew it was not the actual unit, but to work as archaeologists and learn more about Amache they interpreted it as such. Past experience, previous knowledge, instructions from me, and cooperation with other participants and visitors filled in the blanks and provided felt experiences necessary to interacting with this exhibit.

This analogous space also extended from myself, the archaeologist who created this exhibit using a proposed floor plan and the plan map from the site. Constructing this analogous space required a feel from it that can only be obtained by either having been at Amache, through research, or having a deeper connection to the site. Clark (2019, personal communication) shared one such perspective with me on the color of the map's soil after she wanted me to correct it on the exhibit map and design it to appear closer to Amache's actual soil. Clark's reasoning behind this was that if a former internee from Amache visited the exhibit, then they would know if the soil color on the map was wrong. There was this personal sense of place that dictated how I would construct the analogous space. Clark wanted that reflected in the exhibit. How internees and archaeologists view the unit further dictated how participants, visitors, and I would view it, creating another form of materiality within my research. I would even go as far to say that the theories of place and landscape and materiality come together here. Analogous space blurs the lines of both theories to create an exhibit that museum visitors interpreted as a garden used by Japanese American internees at Amache. The ideas and use of pragmatic imagination weave themselves into this theoretical mix in an attempt to draw upon participants' perceptions of what they are working with as they engage in different forms of intergenerational education.

Both place and landscape, and materiality make use of the pragmatic imagination. Participants at Highlands Micro School interacted with the material culture in a way that pushed them to deduce why they found certain artifacts. They could relay previous knowledge and past experience to create this understanding, allowing them in turn to

apply this materialistic view to understanding their school's shared community past. Knowing this public already had their own viewpoint of the excavated material made me consider how I could help expand upon already-established views. Understanding this theoretical framework and participants' previous knowledge influenced how I approached my research, created lesson plans, interacted with the school community, and taught concepts such as archaeological methods, lab methods, object handling, and archaeological stewardship. To say that the material culture played an important role in public education and outreach with Highlands Micro School and the History Colorado Center is an understatement. The theoretical framework of materiality shaped my thesis research in almost every way – this includes the learning process.

Experiential Learning

Experience as the main source of learning in archaeology and intergenerational education cannot be downplayed. Both research sites utilize a form of experiential learning. Theorized and summarized by Kolb (2015) experience is a “source of personal learning and development.” A later chapter in Kolb's work expands upon this brief description:

...the experiential learning theory of development focuses on the transaction between internal characteristics and external circumstances, between personal knowledge and social knowledge. It is the process of learning from experience that shapes and actualizes developmental potentialities. This learning *is* a social process; and thus, the course of individual development is by *the cultural system of social knowledge* (Kolb 2015, emphasis added).

Educational processes at Highlands Micro School followed this basic principle as all lessons I created for the archaeology summer camp promoted intergenerational learning

opportunities through hands-on education that allowed all participants to experience archaeology (Appendix C). Experiential learning plays a role in intergenerational education. This role focuses on experiences over time and learning in a social process that promotes individual development in two different generations while they experience the same educational program. The idea of experiential learning would usually call upon observing a fully testable change based on test scores. My thesis research instead focuses on changing perceptions or attitudes. I rely on studying the learned experience that occurs over the three weeks of intergenerational education in public archaeology using observation guides and surveys (Appendix B).

At the History Colorado Center, I had to apply the ideas of experiential learning differently and in a much shorter timeframe. Visitors stayed at the exhibit for only a few minutes. In those minutes, they made connections or learned something based off their experience with the Amache Entryway Garden Archaeology Exhibit. Unfortunately, in such a case, it would be difficult to receive enough willing participants to answer a full survey, so I crafted a shortened survey for such a purpose (Appendix B). Conversations and observations would also play a major role in understanding what adults and children came away with either together or separately as they engaged differently with the exhibit. A brief understanding of their learning process through experience has the potential to create a base for intergenerational education at an exhibit. This method of education is seen frequently at museums. It is not meant to provide a comprehensive research of intergenerational education at museums, but a place to start and a way to gauge what visitors understood from the exhibit itself.

Of course, I will expand upon the research methodology for both sites in the next chapter. For now, I want to conclude the summary of my theoretical framework by touching on educational models that influence experiential learning.

Lewinian Model of Action Research and Laboratory Training

[This model of learning focuses on the] immediate personal experience [as] the focal point for learning, giving life, texture, and subjective personal meaning to abstract concepts and at the same time providing [a] concrete, publicly shared reference point for testing the implications and validity of ideas created during the learning process (Kolb 2015).

Learning through experience creates feedback processes that are designed to generate the ability to know when something could work better when applied to similar situations.

Through continuous learning, learners will take what has happened during an educational experience and apply it to what they will do in the future to test if it will work better. A visual model depicts this process (Figure 5).

This model, as represented in Figure 5, visualizes the process as cyclical. The process of a learning experience continues until someone becomes satisfied with the way they approach the idea. It allows those who participate in the process to learn from the mistakes or progress they have made throughout their time learning. Then, they can apply what they have learned to future experiences.

Archaeology provides an opportunity to apply this idea. The field itself requires a learning process that expands upon already-comprehended knowledge. People have an idea of what archaeology entails. Expanding upon that past knowledge through comprehensive work and experience in archaeology allows participants to learn from

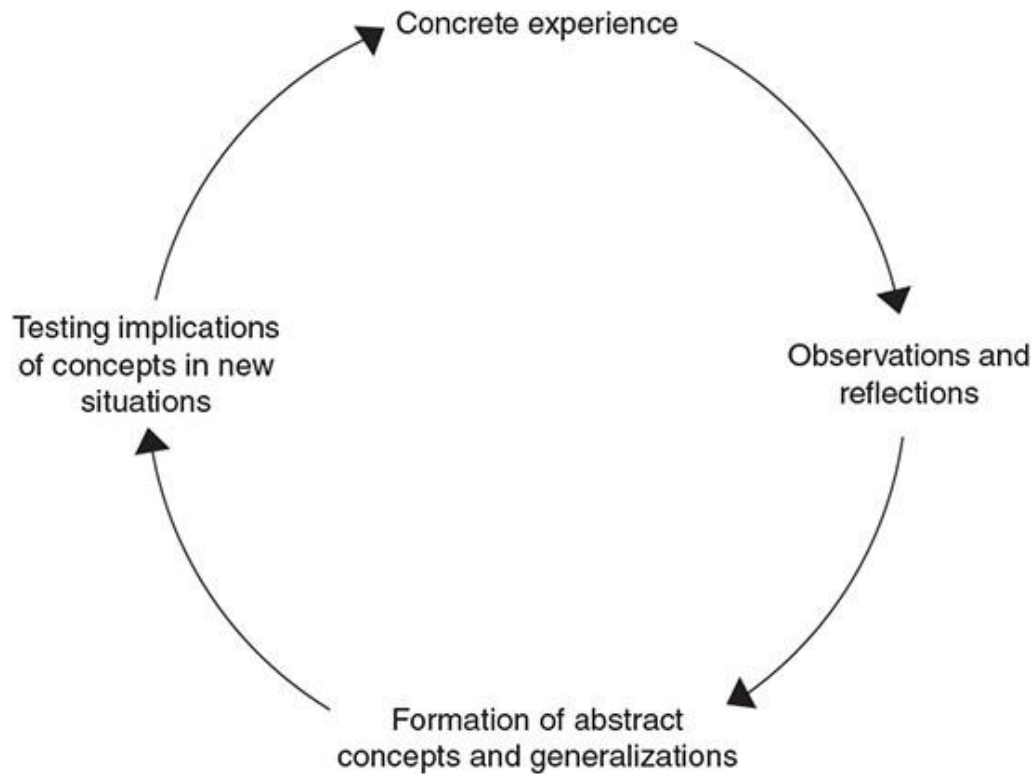


Figure 5: An illustration of Lewin's Experiential Learning Model (Kolb 2015).

experiences they encounter while in the field. Highlands Micro School is an example of such an idea.

Highlands Micro School students originally excavated the hole in their playground, working off what they knew about archaeology and the history of their school. Touring the DU Department of Anthropology gave students a chance to learn new experiences and methods through brief lab work and visiting an archaeological/anthropological institution. Brunst, Ms. Rove, and I created an opportunity for students and parents to take their previous experiences and apply it to a new setting: an archaeological summer camp that focused on survey, excavation, and lab work. In a more comprehensive study on this research, it would be preferable to continue using a cyclical experiential learning

approach to gather further data on expanding experiences through archaeological education.

Dewey's Model of Experiential Learning

Dewey's model appears similar to Lewin's model. The difference is that it further expands upon "how learning transforms the impulses, feeling, and desires of concrete into higher-order purposeful action" (Kolb 2015). In this model, an educator would find the point where learners start to incorporate more meaningful knowledge into what they do in future learning opportunities. One such example in archaeology is archaeological stewardship. This involves a learner observing their surroundings, then thinking about the knowledge they have obtained through past experiences, and finally, combining current observations with past learned behavior (Kolb 2015). Dewey's model may not be as easy to comprehend as the cyclical nature of Lewin's model, but it does consider the environment, the person who makes these decisions based on experience, and how judgement or attitude impact the way in which they incorporate what they have learned into the present. Another visual model may help in understanding this concept (Figure 6).

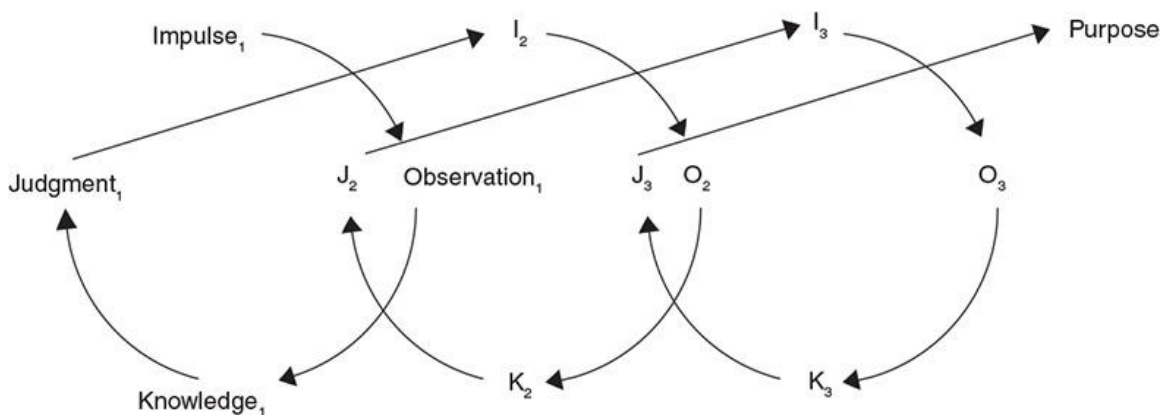


Figure 6: An illustration of Dewey's Model of Experiential Learning (Kolb 2015).

Dewey's model incorporates several of these cyclical patterns as it proceeds from one instance of experience to the next. It starts with the first impulse. Observations are made about what occurred during this impulse, thus allowing the learner to obtain previously unknown knowledge. This then leads to judgement which is applied to the next instance of this impulse. From there, a participant willingly makes the decision to use or not use what they had learned from the past impulse when they interact with the impulse again. This is dependent on the learner and situation, but whatever they choose impacts their knowledge from what they had observed and changes their judgement moving forward. Dewey's process of learning continues onward as the learner interacts with the subject more and more in an *ad infinitum* fashion.

Dewey's Model of Experiential Learning can be applied to archaeological stewardship. The concept must first be recognized by learners. Recognition can be done so in different ways, whether that be through a college course, a museum exhibit, or interacting with the archaeological record. Highlands Micro School students, parents, and teachers learned heavily with the latter of the three through their own excavation. By learning about archaeology (the impulse) the school community received hands-on experience through interacting with material culture they found (the observation). They continued to learn about this material culture through different classes, projects, and the DU visit (the knowledge), which then influenced their views about how to treat the material culture at their school (the judgment). The Highlands Micro School Archaeology Summer Camp (the second impulse) allowed the students to apply their judgments made from previous work with their school's archaeology. What is unique in this specific

instance is the application of children learning alongside adults so that they may bring together their past knowledge and experience. As with the Lewinian Experiential Learning Model, a longer study may make further use of my thesis research or expand upon it.

Piaget's Model of Learning and Cognitive Development

This model specifically focuses on accommodating these ideas with experience and the process of assimilation of these experiences into existing ideas. Piaget's model is recognized as

the process of cognitive growth from concrete to abstract and from active to reflective... based on this continual transaction between assimilation and accommodation, occurring in successive stages, each of which incorporates what has gone before into a new, high level of cognitive functioning (Kolb 2015).

While different from Lewin's and Dewey's model, Piaget's model does touch on the idea of experience serving as an integral factor in learning development. What this model does differently is focus on experiential learning using a cyclical motion and grouping. These grouped stages are as follows: 0-2 years of age is "the sensory-motor stage," a learning focused on cognitive touching and feeling of the world around a child; 2-6 years of age is "the representational stage," a learning focused on seen and interacted with icons by a child; 7-11 years of age is "the intensive development of abstract symbolic powers," a learning focused on relations, classes, and separations; and 12-15 years of age is "the stage of formal operations," a more active learning focus tempered by the "development of... reflective and abstract power" (Kolb 2015). Experience stacks upon experience as a person cognitively proceeds from group to group throughout their childhood and progresses to relying on a balance between accommodating and assimilating ideas into

their lives. Experiences affect learning within different age groups. A visual representation shows the divided groups and what learning focus applies to which group (Figure 7).

Different learning stages represent the different learning ages, with “1. Sensory-motor stage” representing the 0-2 age group. Piaget’s model then flows in a cyclical, clockwise motion to the next learning group, then the next, then the next, until the person has reached their peak of development as an adolescent. These stages provide different ways for a learner to interact with their world at different ages. Such a process helps develop a base that is expanded upon as the learner experiences everything around them more frequently and uniquely, creating different knowledge that flows and can change from stage to stage.

Unfortunately, this model does end with the cognitive development of children and does not continue past teenage years, thereby not applying to the adult group of intergenerational education. Although that may be the case, Piaget’s model should still be considered in relation to the different younger learners present in a group of intergenerational learners. While the child participants at Highlands Micro School were close in age range, the age range differed more at the History Colorado Center. Knowledge of how children’s education intake changes or differs with age in response to experience provides educators a means to provide learning methods that may be acceptable by more than just one pre-adolescent or adolescent age group.

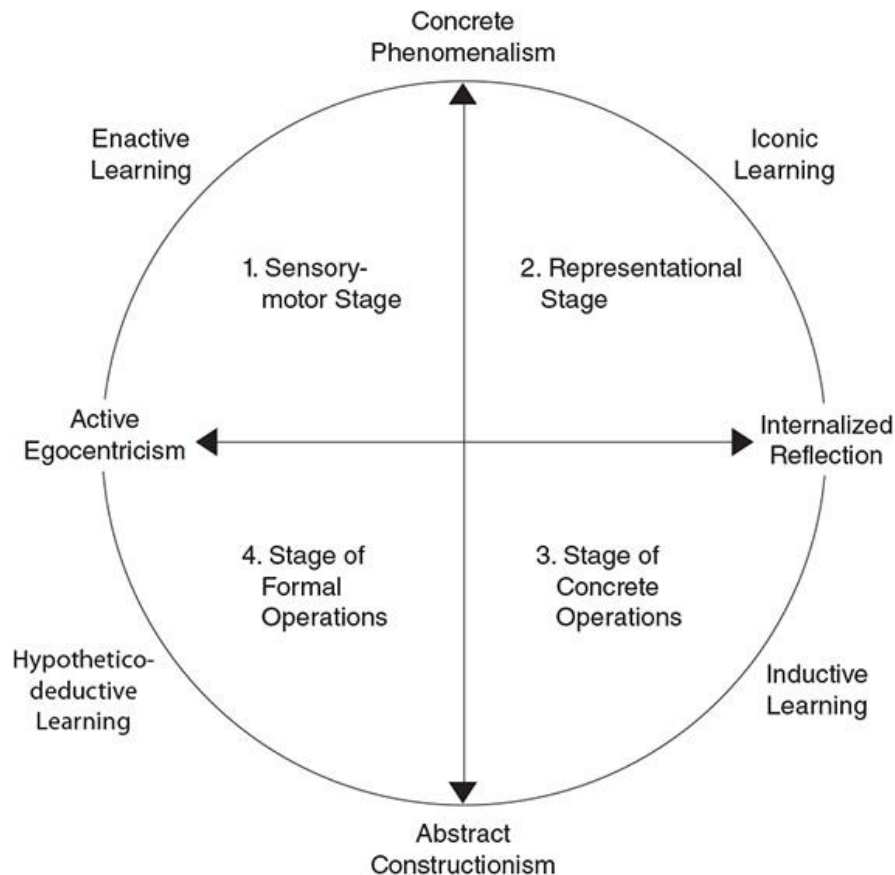


Figure 7: An illustration of Piaget's Model of Learning and Cognitive Development (Kolb 2015)

Clark and I created the Amache Entryway Garden Archaeology Exhibit to provide different learning experiences. If a younger child wanted to simply recreate the garden before them by just drawing, then they could. If an older child wanted to recreate the garden to scale while drawing the correct plants and their locations within the garden, then they could. Adults, all the while, could work with children or interact with me to expand upon their own knowledge. The purpose here is that visitors were expected to come away with different knowledge depending on their age group; however, they were also expected to use this differing group-experiential knowledge together, exchanging ideas to add to what they knew and learned individually. Through this method knowledge

is transferred as interaction occurs presently rather than at a later time. What I expected and wanted to see were further questions from visitors after they had finished their initial interaction with the exhibit. Then, they could continue their curiosity and learn more about the topic in their own time.

Incorporating experiential learning and these models in intergenerational education is important. It provides a way for different generations to share their past and present experiences within their educational setting, allowing them to share different viewpoints and engage in more well-rounded learning opportunities.

Summary

The theoretical framework and processes of my research deal heavily with the tangible – what participants can see and immediately experience through the archaeology around them. To understand what I learned from my observations and surveys, I needed to apply the theories summarized above to my gathered data. While the background and theoretical framework add substance to my thesis research, the methodology provides a way to explore this substance. What follows in the next chapter is an overview of the qualitative and quantitative field and lab methodology I used to answer posited research questions that guided my thesis research.

Chapter 5: Methods

Due to the differences between research sites, my methodology had to be adapted to fit timeframes and participants' interactions with the different material. Ms. Rove and I conducted the Highlands Micro School Archaeology Camp over three weeks, with each week having a different theme. After the camp, I opened the Amache Entryway Garden Archaeology Exhibit at the History Colorado Center temporarily once a week for five weeks. Each site provided different opportunities for adult and child participants to engage with archaeology.

Multi-Site Research and Archaeological Ethnography

I conducted multi-site research at two sites to understand how intergenerational education works at different locations. People have chances to participate in the process of archaeology at different archaeology field sites open to the public. Examples in Colorado include Crow Canyon and Magic Mountain. The Highlands Micro School Archaeology Summer Camp provided participants with the opportunity to engage with archaeology in the field. Museums such as the History Colorado Center provide visitors with the opportunity to engage with archaeology and history. They promote forums for engagement and interaction with different subject matter. I chose these two research sites because they serve as places where the public can engage with archaeology while learning from someone who has experience in the field.

My thesis research also used a form of archaeological ethnography, which Hamilakis and Anagnostopoulos (2013:66) describe as the:

...introduction of ethnographic methods into archaeological projects, or the merging of ethnographic and archaeological practices in order to explore the contemporary relevance and meaning of the material past for diverse publics, the politics of archaeological practices, and the claims and contestations involving past material traces and landscapes.

At Highlands Micro School, archaeological ethnography allows me the chance to understand how the school's community perceived archaeology while teaching them about the field. They engaged in common archaeological practices, providing experiential learning, which allowed me the opportunity to understand how intergenerational education impacts attitudes about archaeology. At the History Colorado Center, archaeological ethnography can be used to briefly examine the ways adult and child museum visitors view archaeology together as they engage with the Amache Entryway Garden Archaeology Exhibit. Treating this project as both an archaeological and ethnographic study, I created three research questions and a research design.

Research Questions and Research Design

Three research questions guided my thesis research:

Research Question 1) In an archaeological setting, how do children learning alongside adults affect the way in which both parties learn about archaeology?

Research Question 2) How do children learning alongside adults affect the way in which both parties learn about archaeology in a museum setting?

Research Question 3) What differences, if any, are there between the impact of archaeological intergenerational education at Highlands Micro School and the History Colorado Center?

After conducting research at Highlands Micro School and the History Colorado Center, I realized that these questions only provided an umbrella for more specific questions. The methods I incorporated into my research required specific questions to address the qualitative and quantitative data I had gathered. For that reason, I added sub-questions to both *Research Question 1* and *Research Question 2* so that I could better focus on the different types of data I gathered at both research sites:

Research Question 1)

- a. Do significant changes occur between the averaged question scores when comparing pre- and post-surveys?
- b. Do significant changes occur between participants' averaged scores when comparing pre- and post-surveys?
- c. Are adult participants' averaged pre- and post-survey scores similar to child participants' averaged pre- and post-survey scores?
- d. What words do participants use to describe archaeology before and after the archaeology camp?
- e. How do participants feel about their time learning and what observations can be made of them while they participated in the archaeology summer camp?

Research Question 2)

- a. What words do participants use to describe archaeology after participating in the exhibit?
- b. What observations can be made about adults and children interacting together to learn about archaeology?

The participant population included parents and students from Highlands Micro School (n=22) who participated in the archaeology summer camp. This includes all participants who provided written responses, agreed to be observed, and participated in the survey. At the History Colorado Center, the participant population included adult and child museum visitors (n=118) who visited the Amache Entryway Garden Archaeology Exhibit. A fraction of the participants at this site participated in the survey (n=19).

Highlands Micro School

After Highlands Micro School visited the University of Denver (DU) Department of Anthropology, Ms. Rove and I stayed in contact after the students exhibited continued interest in archaeology. We decided to plan an archaeology summer camp for parents and students to continue their education about archaeology and help with my thesis research.

The Highlands Micro School Archaeology Summer Camp required months of planning that included working with DU's Office of Research and Sponsored Programs (ORSP) and Institutional Review Board (IRB) to conduct research on human participants, and Colorado's Office of Archaeology and Historical Preservation (OAHP) to secure proper permits for archaeological fieldwork at the school. Ms. Rove remained my primary contact at Highlands Micro School and helped me plan the lessons for the camp.

The archaeology summer camp fit within the school's summer schedule and created a lot of interest amongst parents and students, many of whom wanted to be involved with the process. Ms. Rove did most of the preliminary recruiting of parents and students who wanted to take part in the summer camp. However, I acquired participant assent and consent in my research before and during the camp.

To create this camp, I also needed to prepare different lesson plans to fit around the informal unit the students had excavated in their playground (Appendix C). These lesson plans incorporate three themes:

1. Archaeological survey week focused on teaching the children about survey in archaeology using their schoolgrounds. This included conducting ground penetrating radar (GPR) by Brian Brunst, Brianna Dalessandro, and myself.
2. Excavation week focused on using the informal unit in the school's playground to teach the participants about proper excavation techniques, unit set-up, and site maintenance, as well as stewardship of archaeological resources.
3. Lab week focused on using the artifacts the students had previously excavated and the artifacts from excavation week to teach the participants about analyzing and interacting with the material culture found at an archaeology site.

I incorporated these lesson plans into the three-week archaeology summer camp from June 10 to 28, 2019. I created different learning opportunities with help from the Project Archaeology teaching guide, *Intrigue of the Past: A Teacher's Activity Guide for Fourth through Seventh Grades* (Smith et al. 1996). My thesis research and lesson plans were framed around the "enduring understandings" from Project Archaeology (Moe 2019:10):

1. Understanding the past is essential for understanding the present and shaping the future.
2. Learning about culture, past and present, is essential for living in a pluralistic society and world.
3. Archaeology is a systematic way to know about the past.
4. Stewardship of archaeological sites is everyone's responsibility.

The History Colorado Center

With Bonnie Clark's help, I created a temporary interactive exhibit for Archaeology Day at the History Colorado Center on May 11, 2019. The Amache Entryway Garden Archaeology Exhibit focused on informing visitors about the Amache Project led by Clark and how palynology can be incorporated into archaeology, with reference to the 2014 report on the DU Amache Project Field School Investigations (Haas and Starke 2017). Archaeology Day provided a chance to pilot the exhibit, but I did not use any of the observations or data gathered that day in my research.

This exhibit incorporated a unit map of a garden excavated during the 2014 DU Amache Project Field School. Visitors interacted with a worksheet using a smaller version of the map as they saw fit after a brief lesson on archaeology and the Amache Japanese American Internment Camp (Appendix D). The exhibit encouraged participants and visitors to ask me questions about the archaeology of Amache and interact with each other intergenerationally to complete the worksheet handed out to them. This exhibit provided information on Amache and the stewardship of recent archaeology sites. It also included different learning opportunities for visitors, such as intergenerational learning, interaction with me, completing the exhibit worksheet, or observing the exhibit. After piloting the exhibit and gaining permission from the History Colorado Center, I brought

back the Amache Entryway Garden Archaeology Exhibit on July 2, 11, 18, and 25, 2019, and August 1, 2019 to research intergenerational education and learning after the Highlands Micro School Archaeology Summer Camp had concluded.

A Mixed Methods Approach

Researchers use a mixture of methods to examine the impact of intergenerational education on participants (Kaplan 1994; Mannion and Adey 2011; George et al. 2011). My thesis research includes a quantitative survey, qualitative methods, and archaeological methods. I used the survey to understand if any significant changes occurred from before to after the archaeology summer camp at Highlands Micro School and what words participants used to describe archaeology after interacting with the exhibit at the History Colorado Center. I used participants' journals and write-ups, and my field notes and observation guides to understand what specific themes arose from the participants' experiences at the research sites.

Archaeological methods contributed to understanding the archaeological data from the Highlands Micro School Site. However, I did not use the archaeological data or methods to answer my research questions. I instead used them as a tool to help develop the lessons and surveys I created to gather said data. Therefore, I will describe my archaeology methods in this chapter, but will not review the archaeological data in the next chapter.

Quantitative Methods

At Highlands Micro School and the History Colorado Center, I conducted a survey to see how adult and child participants viewed archaeology. The surveys were similar and

different at both sites. Since I had more time to interact with and teach participants at Highlands Micro School, I issued a more comprehensive survey asking 15 questions; at the History Colorado Center, due to the short timeframe visitors interacted with the exhibit, I issued a less comprehensive survey asking 2 questions (Appendix B). I pulled words and themes from a study by Ipsos (2018) on Americans' perception of archaeology to help me create the surveys.

At Highlands Micro School, I conducted the survey using the online survey program Qualtrics at the beginning and end of each participant's time at the archaeology summer camp to understand if any changes in attitude towards archaeology occurred. Scores for Questions 3 through 14 were graded using a Likert Scale, where a 1 indicated participant opinions such as very interested, extremely important, or strongly agree, while a 5 indicated participant opinions such as very uninterested, not at all important, or strongly disagree. The lowest possible total participant score could be 12 and the highest possible total participant score could be 60 when participants answered all questions. Lower scores indicate more positive perceptions or attitudes towards archaeology; higher scores indicate fewer positive perceptions or attitudes towards archaeology.

At the History Colorado Center, I conducted the survey using physical copies that only asked two questions from the original Qualtrics survey: "Are you an adult or a child (under 18 years old)?" and "What five words would you use to describe archaeology?" Participants took the survey after they interacted with the exhibit and chose five words from a list to describe archaeology. Once I had gathered all data and analyzed it, I compared the answers to "What five words would you use to describe archaeology?"

from both research sites to understand if adult and child participants viewed archaeology similarly or differently between sites.

Qualitative Methods

I used an observation guide created for my thesis research to directly observe participants (Appendix B). This provided me a chance to understand how adult and child participants interacted with each other at both research sites while they learned about archaeology. Child participants at Highlands Micro School recorded their experiences in journals, including what they had learned during the archaeology summer camp and their thoughts on working with adults. Adult participants at Highlands Micro School provided notes and a write-up of what they had learned while working with children. This provided me with information on what participants thought about the summer camp by analyzing their own words (Appendix C). Due to limitations and time constraints at the History Colorado Center, I did not use journals or write-ups, only relying on field notes and observation guides for my research.

During the course of data analysis, I recognized six different themes appearing in the qualitative data: engagement, intergenerational communication, learner controlling learning, archaeology, perceptions of intergenerational education/learning, and community engagement. Once I gathered these themes from the observation guides from both sites, I compared the themes to understand if there were differences or similarities in how adult and child participants interacted with archaeology between sites.

Archaeology Methods

As part of my research, I conducted site maintenance of the impromptu unit excavated by students at Highlands Micro School. I also used the unit to teach participants about proper excavation, archaeological stewardship, and the archaeological record of their school.

Brunst and I did a preliminary analysis on the artifacts that the students and Ms. Rove brought to DU during their tour. At the time they visited, we also asked what they could tell us about the impromptu unit. Once we had information on the site's time period and what would likely be found there, we decided it would be best to provide maintenance on the impromptu unit and conduct a GPR survey.

Before we started work at the site, I set up a datum at the southwest corner of the school building and marked it in Avenza Maps, a mapping app on my iPhone. Due to the nature and size of this project, I did not use a TRIMBLE or total station. Brunst and I recorded GPS points for all corners of Unit 5E/2N and all GPR grids.

Participants, Brunst, and I set up a 1x1 meter unit around the impromptu unit to better assign space and help with mapping, dubbing it Unit 5E/2N. Then, we started conducting maintenance by digging back a side hole students dug to search for artifacts (Figure 8). From there, we flattened all the ledges created by the students and cleaned out the debris from the hole as we excavated the unit's lower walls.

Soil was screened through a ¼" sift. Artifacts were collected and separated by level and material into different bags and recorded on a master artifact sheet whenever we needed new bags for different levels.

Unit levels were assigned before excavation, before the cultural deposit level, and after the cultural deposit level (Figure 9). Opening and closing photos were taken of each level and, once we had finished excavation, I drew a plan map of the unit (Figure 10) and a profile of the unit's west wall (Figure 11). Brunst and I documented and recorded each level before proceeding to the next level. Dalessandro conducted GPR during the first week of the summer camp, with the details recorded in her report (Appendix E).



Figure 8: Unit 5E/2N after excavation and mitigation ended

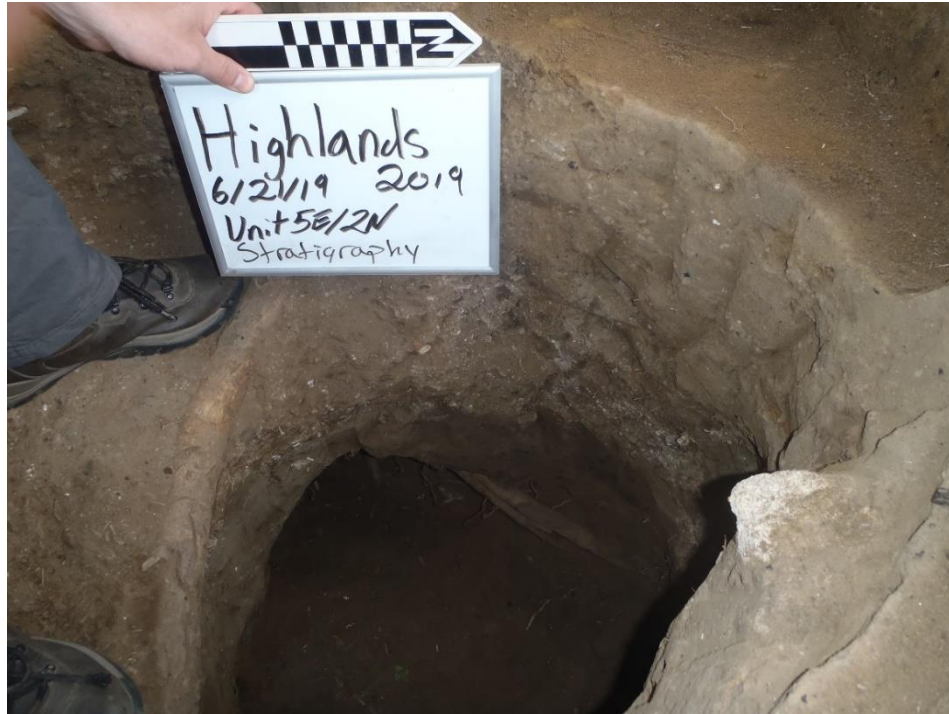


Figure 9: Picture of Unit 5E/2N west wall stratigraphy; the "west wall" hole is at the bottom

Due to not being the main objective of my thesis, I will not explain or expand upon the archaeological findings from Highlands Micro School in my data analysis. For a more in-depth explanation, please read the field report I wrote for the Office of the State Archaeologist of Colorado (OSAC; Appendix E).

Consent, Participant Recruitment, and Archaeological Permit

The DU IRB provided me with an approval for research at Highlands Micro School and the History Colorado Center through an expedited review process. I also worked out research agreements with representatives from Highlands Micro School and the History Colorado Center.

Before the archaeology summer camp began, Ms. Rove and I recruited participants from Highlands Micro School through an introductory letter and from students who had

signed up for the archaeology camp. Students' parents then provided consent for participation in my research. On the first day of summer camp, I gathered assent from all student participants. I also received consent from adult participants who came on certain days to learn at the summer camp with students (Appendix A).

Due to the fast-paced nature of observation and survey in a museum setting, I acquired a waiver of informed consent for research at my second site, the History Colorado Center. At the exhibit's activity table and the beginning of the surveys, I placed a disclaimer to inform visitors of their participation in my research (Appendix A).

Finally, for the impromptu archaeological unit at Highlands Micro School, I applied for and received a permit to conduct archaeological survey of the site by Colorado's OAHP. This permit covered site maintenance of Unit 5E/2N, collection of artifacts, and a GPR survey. A field report is being written in compliance with the permit provided by OAHP (Appendix E).

Data Management

Personal details from all participants remained anonymous. I only gathered their generational descriptor (adult or child), answers to survey questions, and observations. The names of students and parents at Highlands Micro School were coded using random numbers, starting at 001 through 022. Adult and children visitors at the History Colorado Center were assigned random numbers after I collected all of their surveys, starting at 023 through 041. Student journals, parental write-ups, observation guides, field notes, and physical copies of the surveys are stored within the secured archaeology laboratory at

DU, and digital copies of surveys are stored on Qualtrics's secure databases and a password-protected computer.

Data Analysis

After research had concluded, quantitative, qualitative, and archaeological data analysis followed.

Quantitative Methods

Once participants had completed their surveys, I entered and cleaned up the data on Microsoft Excel. Then, I conducted chi-squared testing to determine if any significant differences occurred between individual question scores and participant scores before and after the archaeology summer camp at Highlands Micro School. Once I finished the chi-squared testing, I used paired t-tests to understand the significant differences that occurred between the pre- and post-survey averaged question scores and participant scores. Finally, I used two-sample independent t-tests to determine the relationship between adult and child participants pre- and post-surveys answers.

Survey data collected from the History Colorado Center only contained Question 2 (Question 15 on the Highlands Micro School survey). The way I approached Question 2 and Question 15 in the surveys was different from how I approached analyzing the quantitative data for questions 3 through 14 at Highlands Micro School.

Question 2 in the History Colorado Center survey asked participants "What five words would you use to describe archaeology?" before presenting them with different word choices to answer the question. Question 15 in the Highlands Micro School survey used the same question. Then, I entered these data as numerical values in Microsoft Excel

Plan Map of Unit 5E/2N

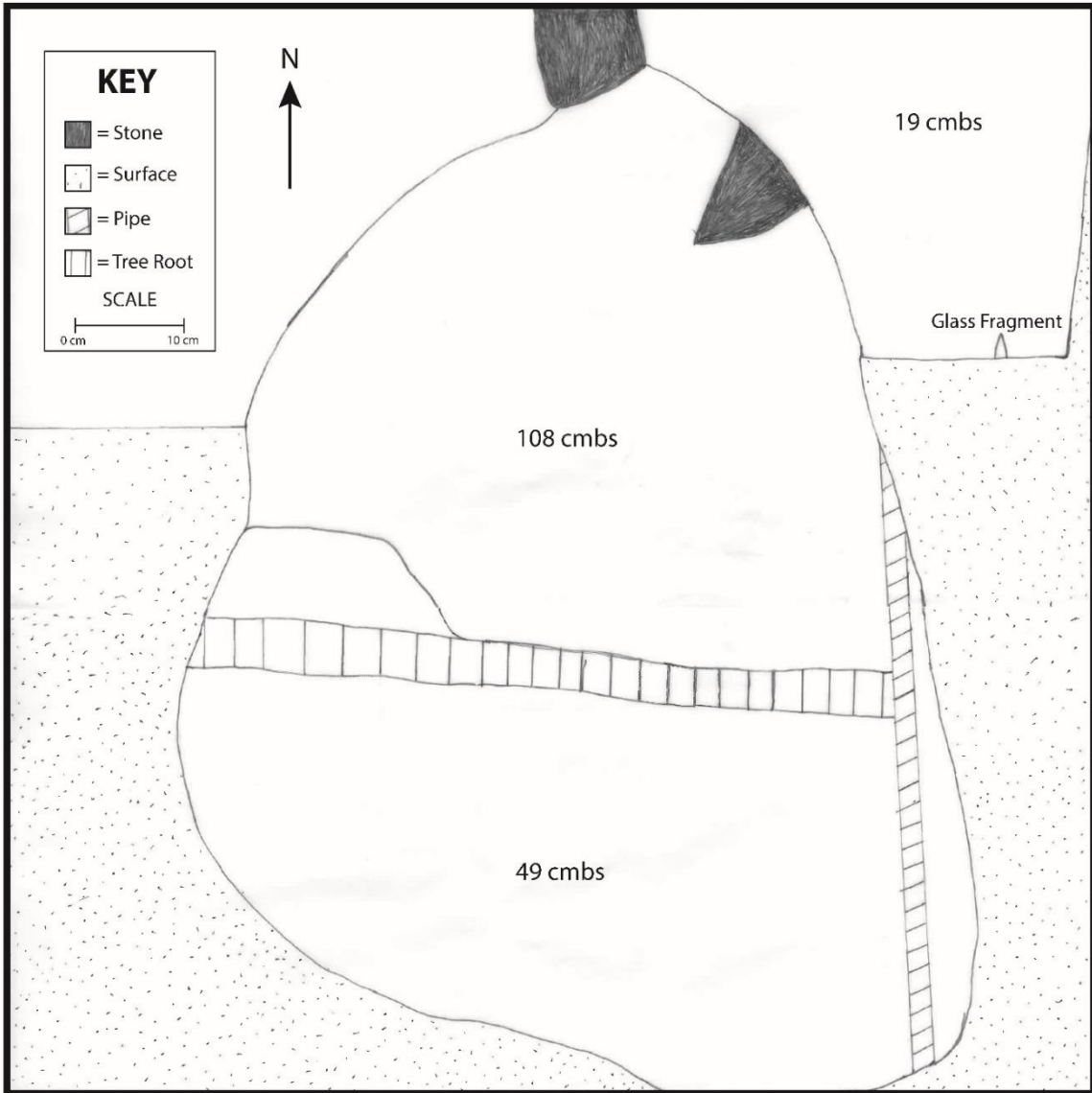


Figure 10: Plan map of Unit 5E/2N

Profile of Unit 5E/2N West Wall

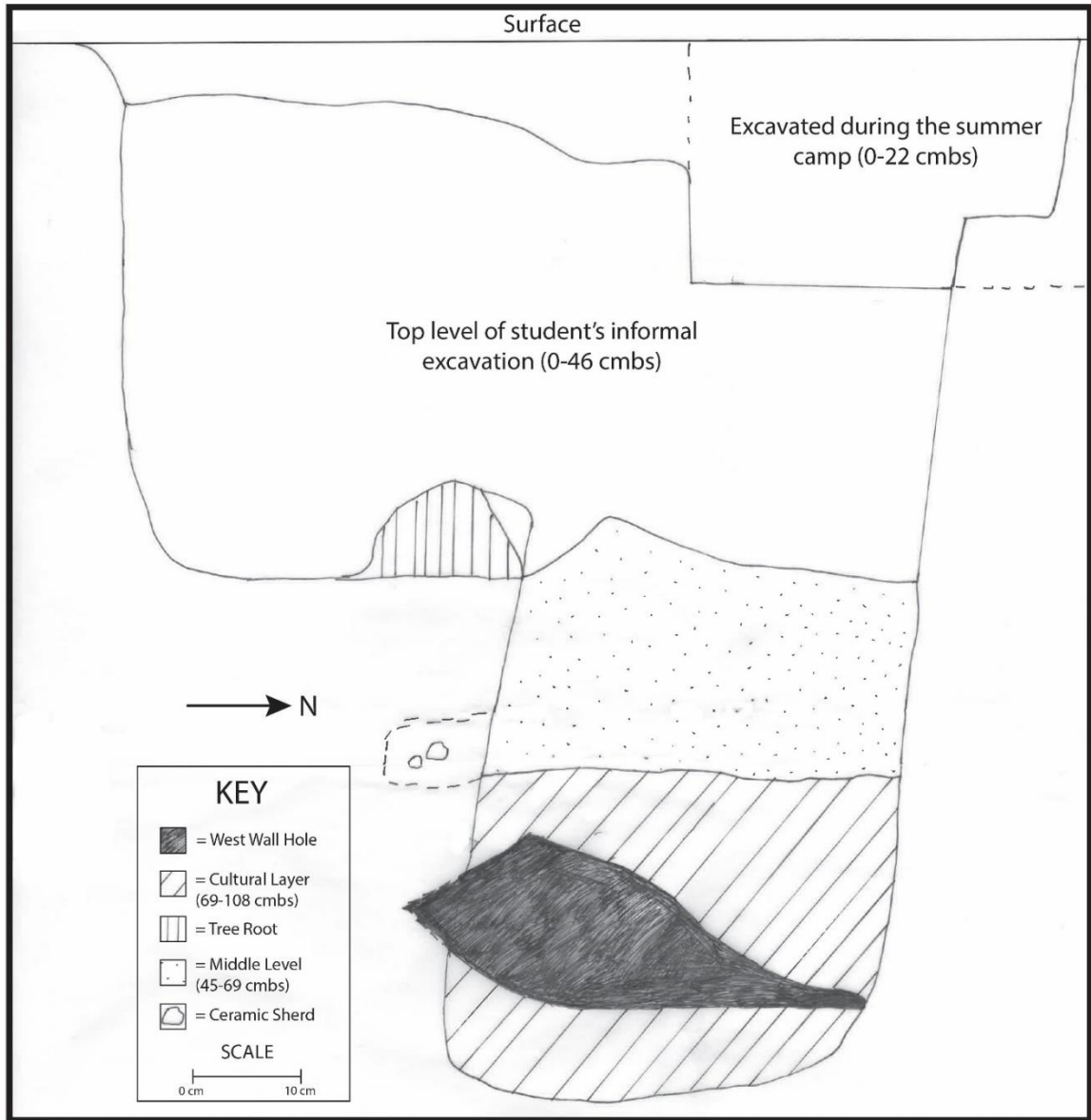


Figure 11: Profile of Unit 5E/2N's west wall

and created graphs. After that, I conducted brief descriptive statistics to see the differences and similarities between these questions in the pre- and post-surveys at Highlands Micro School, and between the post-surveys at Highlands Micro School and the History Colorado Center. These descriptive statistics provide additional data for thematic analysis at both sites.

Qualitative Methods

I analyzed and coded student journals, parental write-ups, and observation guides for any emerging themes using thematic analysis. After I had coded these themes, I examined them to understand how teaching archaeology within an intergenerational setting occurs at both research sites. I analyzed how participants perceived their learning process and the observations I made while they participated in the process. Due to how quick analysis needs to occur during an exhibit, I only used the same observation guides from Highlands Micro School at the History Colorado Center.

I used forms of comparative descriptive statistics of Question 2 and Question 15 and comparative thematic analysis to qualitatively compare themes from observation guides at both research sites. Then, I took the codes related to each theme and tallied their frequency under each theme to conduct chi-squared testing between research sites. Using these different data, I want to further understand what differences or similarities occur when using intergenerational education at an archaeology site and in a museum.

Archaeological Data

The archaeological record in Unit 5E/2N was not well-defined due to the students at Highlands Micro School excavating most of the unit before I became involved. I still

used it to understand the archaeology of the school. Brunst and I analyzed objects found in the unit, including artifact type, material type, relative year it was made (as denoted by maker's marks and other temporally diagnostic features), and measurements. Once Brunst and I finished analysis, we then incorporated them into an inventory with artifacts collected by the students before the archaeology summer camp. This inventory included pictures of notable artifacts. I included photos, a photolog, and an artifact inventory in my final report to OSAC. Dalessandro analyzed the GPR data and compiled it into a report which I included in my thesis appendices and field report to OSAC.

Mapping data was limited to Highlands Micro School and did not require tools such as a TRIMBLE or total station due to the size of the field site. I placed a datum on the southwest corner of the building and collected GPS points for Unit 5E/2N, GPR grid locations, and one plotted point where children found glass fragments during the summer camp using Avenza Maps on my iPhone before plotting them on a digital map. Once Brunst and I finished the artifact inventory, we returned the artifacts to the ownership and curation of the school per agreement with Ms. Rove and the school director, Ms. Anne Wintemute.

Limitations

When considering this research, there are certain limitations that should be mentioned. First, it must be noted that this research is not meant to focus on creating a curriculum for intergenerational education in public archaeology. This research's aim is to understand the perceptions and attitudes of archaeology when taught in an intergenerational setting. For that reason and due to the small participant population at

both research sites, I could not use a control group to determine if intergenerational education in public archaeology is more impactful than monogenerational education. Future research expanding upon my thesis research could provide this comparison.

As for participant populations, the small amount of people at Highlands Micro School and their varied schedules made it difficult, at certain points, to ensure a wholly intergenerational group of participants at all times. Due to this expected limitation, I focused on instances of intergenerational communication, education, and learning over the course of the archaeology summer camp and received personal written responses from adult and child participants. At the History Colorado Center, the fast-paced environment that is part of a museum setting prevented descriptive personal feedback from participants or a more comprehensive survey, such as the one at Highlands Micro School.

Research involving a more comprehensive and in-depth study of intergenerational education within public archaeology could expand upon my thesis research. Because of the lack of research into this topic, this thesis is meant to serve as a base case study to help in promoting different educational opportunities of archaeology in public intergenerational museum and field settings.

Summary

My thesis research was used to understand the themes and changing attitudes of intergenerational education in archaeology. This is a way to see how public archaeologists that focus on teaching archaeology to people at a field site or museum can use intergenerational education. A total of 14 students, 8 parents, and 118 adult and child

museum visitors participated in this study (Table 1). All the research and data analysis methods have been described in this chapter, with the findings and results detailed in Chapter 6.

Table 1: Total number of participants based on research site, generation, and data gathering tool.

	Observation Guides	Journals	Write-Ups	Survey
HMS Adults	8	0	3	6
HMS Children	14	13	0	14
HMS Total	22	13	3	20
HCC Adults	56	0	0	13
HCC Children	62	0	0	6
HCC Total	118	0	0	19
Overall Participant Total	140	13	3	39

Chapter 6: Findings and Results

To properly assess the research questions that I posited in Chapter 5, I had to use qualitative and quantitative data analysis. This included determining the arising themes that appeared as intergenerational audiences engaged in learning about archaeology in a field setting and a museum setting, and which words participants primarily used to describe archaeology. Analysis also included determining if significant differences existed between participants' answers to the pre- and post-surveys at the Highlands Micro School Archaeology Summer Camp. I divided this chapter into sections by research question and sub-question. I included figures, tables, and graphs to provide visual data for the reader to refer to as needed.

Research Question 1

Research Question 1 asked, "In an archaeological setting, how do children learning alongside adults affect the way in which both parties learn about archaeology?" This question focused on attitudes towards archaeology during and after I conducted educational outreach with a group of intergenerational participants at Highlands Micro School. All statistical testing for my thesis research was compared to a confidence interval of 95% ($\alpha=0.05$) to determine the level of significance.

a) Do significant changes occur between the averaged question scores when comparing pre- and post-surveys?

I first conducted chi-squared testing, comparing and totaling the scores of each question from questions 3-14 of the pre- and post-surveys (n=12). Results showed no significant differences had occurred between the pre- and post-surveys ($\chi^2=4.35$; D.F.=11). While this may be the case, I saw that question 5, 'How important is archaeology to your community?', exhibited the greatest difference during chi-squared testing (see Appendix F for tests). I will analyze the importance of this difference in a later section.

Next, I conducted t-testing between the average scores of each question. The average score of pre-survey questions was 37.83 and the average score of post-survey questions was 38.00, only showing an increase of 0.17 of a point from pre- to post-survey (Table 2).

It must be noted that one participant (017) did not answer all questions for the post-survey. For those questions, I considered them unanswered and entered their numerical value as a 0 when entering data. The increase from a lower score (pre-survey) to a higher score (post-survey) also indicated a negative shift in the participant population's attitudes towards archaeology, although not significantly. My hypotheses for the tests are as follows:

H₀: There is no significant difference between the pre-survey's averaged question scores before the archaeology summer camp compared to the post-survey's averaged question scores after the archaeology summer camp.

H₁: There is a significant difference between the pre-survey's averaged question scores before the archaeology summer camp compared to the post-survey's averaged question scores after the archaeology summer camp.

The calculated value of the t-stat (-0.1355; D.F.=11) is less than the critical two-tail t value (2.2010). The t-stat indicates that the null hypothesis cannot be refuted. There is no significant difference between the pre- and post-surveys' averaged question scores given to the participant population before and after the archaeology summer camp. Questions did not exhibit significant differences between the pre- and post-survey when conducting t-testing.

Table 2: Pre-survey/Post-survey Averaged Question Scores Paired Comparison t-Test

	<i>Pre-Survey</i>	<i>Post-Survey</i>
Mean	37.83333333	38
Variance	89.06060606	34.90909091
Observations	12	12
Pearson Correlation	0.948895106	
Hypothesized Mean Difference	0	
df	11	
t Stat	-0.135513615	
P(T<=t) one-tail	0.447326919	
t Critical one-tail	1.795884819	
P(T<=t) two-tail	0.894653837	
t Critical two-tail	2.20098516	

b) Do significant changes occur between participants' averaged scores when comparing pre- and post-surveys?

As with Research Question 1a, I first conducted chi-squared testing on quantitative data. Instead of analyzing the total scores of each individual question this time, I analyzed the total scores of each individual participant (n=20). Results showed no significant difference between pre- and post-survey scores ($\chi^2=24.62$; D.F.=19; see Appendix F for test).

I conducted t-testing between the averaged participant scores. The average score of the pre-survey was 22.7 and the average score of the post-survey was 22.8, only showing an increase of 0.1 of a point from pre- to post-survey (Table 3).

Again, it must be noted that one participant (017) did not answer all questions for the post-survey. The increase from a lower score (pre-survey) to a higher score (post-survey) also indicated a negative shift in the participant population's attitudes towards archaeology, although not significantly. My hypotheses for the tests are as follows:

H₀: There is no significant difference between the participant population's averaged pre-survey scores compared to their averaged post-survey scores.

H₁: There is a significant difference between the participant population's averaged pre-survey scores compared to their averaged post-survey scores.

The calculated value of the t-stat (-0.0812; D.F.=19) is less than the critical two-tail t value (2.0930). This lesser value of the t-stat indicates that the null hypothesis cannot be refuted. There is no significant difference between the averaged pre- and post-survey

participant scores. The participant populations' overall attitude towards archaeology did not significantly change when the averaged participant scores were compared.

Table 3: Pre-survey/Post-survey Averaged Participant Scores Paired Comparison t-Test

	<i>Pre-Survey</i>	<i>Post-Survey</i>
Mean	22.7	22.8
Variance	20.64210526	33.01052632
Observations	20	20
Pearson Correlation	0.447203014	
Hypothesized Mean Difference	0	
df	19	
t Stat	-0.081237391	
P(T<=t) one-tail	0.468051408	
t Critical one-tail	1.729132812	
P(T<=t) two-tail	0.936102817	
t Critical two-tail	2.093024054	

c) Are adult participants' averaged pre- and post-survey scores similar to child participants' averaged pre- and post-survey scores?

Due to the difference in participant population numbers between adults (n=6) and children (n=14), I conducted two-samples independent t-tests with both pre- and post-survey scores to determine if similar attitudes towards archaeology exist between generations.

First, I conducted testing on the adult and child participants' averaged scores from the pre-survey. The average score for adult participants was 23.67 and 22.29 for child participants, only showing an average difference of 1.38 points between adults and children (Table 4).

My hypotheses for this test are as follows:

H₀: There is no significant difference between the adult participants' averaged pre-survey scores when compared to the child participants' averaged pre-survey scores.

H₁: There is a significant difference between the adult participants' averaged pre-survey scores when compared to the child participants' averaged pre-survey scores.

Comparing the average scores of the adult and child participant populations show that no significant difference exists between the two groups in the pre-survey. The calculated value of the t-stat (0.6082; D.F.=9) is less than the critical two-tail t value (2.2622). This lesser value of the t-stat indicates that the null hypothesis cannot be refuted. There is no significant difference between adult participants' averaged pre-survey scores when compared to child participants' averaged pre-survey scores.

Table 4: Adult and Child Participants' Averaged Pre-Survey Scores Two-Samples Independent, Assuming Unequal Variances, t-Test

	<i>Adult Scores</i>	<i>Children Scores</i>
Mean	23.66666667	22.28571429
Variance	21.86666667	21.14285714
Observations	6	14
Hypothesized Mean Difference	0	
df	9	
t Stat	0.608245878	
P(T<=t) one-tail	0.279030093	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.558060186	
t Critical two-tail	2.262157163	

After conducting testing on the different generational groups' averaged pre-survey scores, I continued testing using their averaged post-survey scores. The average score for adult participants was 23.00 and 22.71 for child participants, only showing an average difference of 0.29 of a point between groups (Table 5).

Comparing the averaged scores of the adult and child participant populations show that no significant difference exists between the two groups in the post-survey. The calculated value of the t-stat (0.1161; D.F.=14) is less than the critical two-tail t value (2.1448). This lesser value of the t-stat indicates that the null hypothesis cannot be refuted. There is no significant difference between the adult participants' averaged post-survey scores when compared to the child participants' averaged post-survey scores.

Table 5: Adult and Child Participants' Averaged Post-Survey Scores Two-Samples Independent, Assuming Unequal Variances, t-Test

	<i>Adult Scores</i>	<i>Children Scores</i>
Mean	23	22.71428571
Variance	18.8	40.98901099
Observations	6	14
Hypothesized Mean Difference	0	
df	14	
t Stat	0.116052773	
P(T<=t) one-tail	0.454629487	
t Critical one-tail	1.761310136	
P(T<=t) two-tail	0.909258974	
t Critical two-tail	2.144786688	

However, while not significant, it should be noted that there is a decrease in the t-stat between the two-samples independent t-tests. The t-stat for the pre-survey two-samples independent t-test between adult and child participants' averaged scores was higher

($t=0.6082$) than the t-stat for the post-survey two-samples independent t-test between adult and child participants' averaged scores ($t=0.1161$).

d) What words do participants use to describe archaeology before and after the archaeology summer camp?

The public views archaeology differently than archaeologists, as they are not professionally tied to the field. Therefore, an archaeologist's understanding of archaeology may differ from a member of a non-archaeologist or avocational archaeologist community. For that reason, these communities will likely use different words to define archaeology, coming up with their own ideas about what it entails.

Using an Ipsos (2018) survey on what the public thinks of archaeology as a reference, I included words for participants at Highlands Micro School to choose from in my own survey in the form of Question 15 (Appendix B). How participants answered this question provided an understanding of how the intergenerational community at Highlands Micro School viewed archaeology through the words or phrases they used before and after the summer camp. Their answers also contributed data to my thematic analysis.

Each participant answered Question 15 of the survey, "What five words would you use to describe archaeology?" They were allowed to choose from 15 words: dirt, digging, fun, educational, dinosaurs, bones, needed, unneeded, cultures, people, artifacts, exploring, treasure, ruins, and caves.

Before the archaeology summer camp, participants primarily used these 5 words to describe archaeology: digging ($n=15$; 15%), artifacts ($n=13$; 13%), and tied three-ways

between fun, educational, and cultures (n=12; 12%). Results are represented in a chart (Figure 12).

Participants tended to use words directed more towards excavating objects in archaeology (digging and artifacts were the two words most participants used (n=28; 28%)). They focused on the things that they could touch and study. This falls within the theoretical framework of materialism (Taylor 2006) and how participants originally viewed the unearthed objects during archaeological excavation. One participant (1%) did note that they felt archaeology was unneeded, but 4 participants (4%) thought otherwise, choosing needed to describe archaeology.

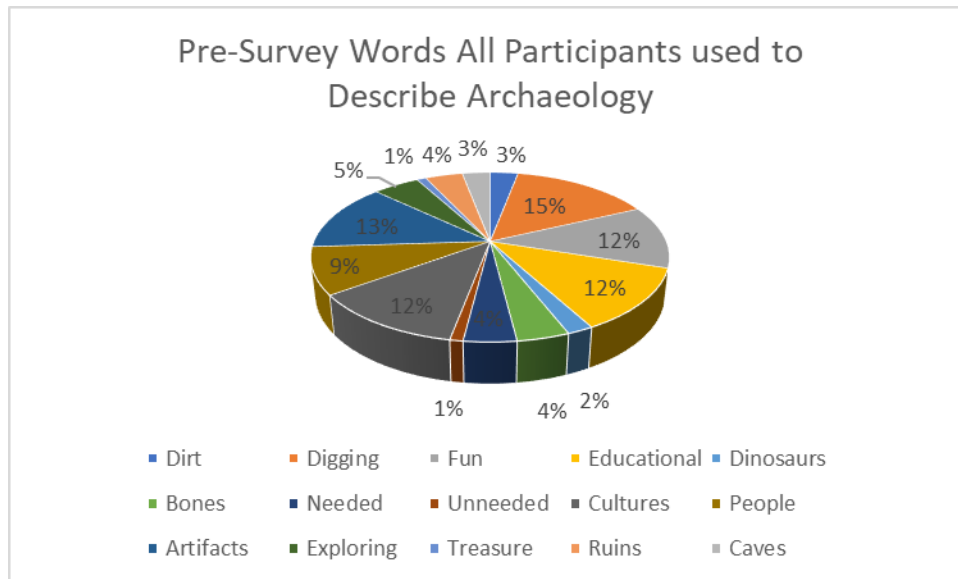


Figure 12: A chart of the words Highlands Micro School participants chose to describe archaeology in the pre-survey

Other participants believed archaeology focused on people (9%) or exploring (5%). Two participants (2%) did use the word dinosaur to describe archaeology.

After the archaeology summer camp, participants primarily used these 5 words to describe archaeology: artifacts (n=16; 16%), cultures (n=12;12%) and fun (n=12; 12%), and digging (n=11; 11%) and educational (n=11; 11%). Results are represented in a chart (Figure 13).

Participants continued to choose words such as artifacts (n=16; 16%) after participating in the archaeology summer camp. Digging saw a decrease (n=11; 11%) when the post-survey was compared to the pre-survey (n=15; 15%). Words such as needed (n=6; 6%) and ruins (n=8; 8%) saw an increase when the post-survey was compared to the pre-survey (n=4; 4%; n=4; 4%, respectively). Finally, no participants chose dinosaurs to describe archaeology in the post-survey. These data provide an idea of what intergenerational populations think of archaeology. A more extensive data analysis

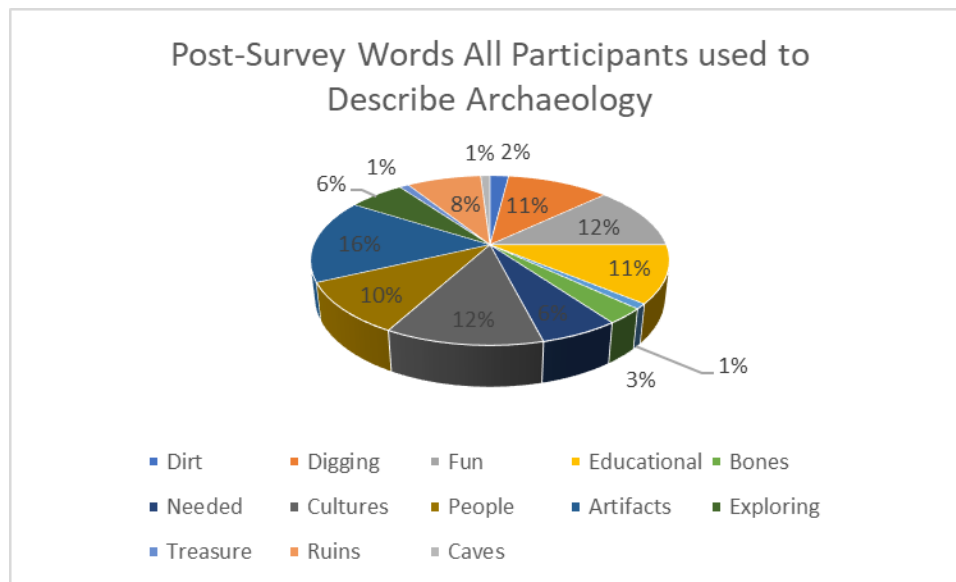


Figure 13: A chart of the words Highlands Micro School participants chose to describe archaeology in the post-survey

would be needed to determine significant differences that occur from before to after intergenerational education is introduced into archaeological programming.

e) How do participants feel about their time learning and what observations can be made of them while they participated in the archaeology summer camp?

My thesis research on intergenerational education and learning is meant to provide a glimpse at participants' attitudes towards archaeology at Highlands Micro School. Observation guides, child participants' journals, and adult participants' write-ups provided insight into their thoughts and actions regarding archaeology and learning with another generation. Understanding these attitudes required examining engagement, if intergenerational communication occurred, how learners controlled their learning, their interactions with and ideas about archaeology, perceptions of intergenerational education/learning, and if community engagement occurred.

Engagement

During the course of the archaeology summer camp, participants engaged with archaeology and each other in the learning process. It is helpful to ensure that engagement with archaeology and the lessons occurred. It is also helpful to determine who participants engaged with and how participants engaged with the learning material.

Child participants' journals and adult participants' write-ups indicated if they felt engaged in the learning process. Over half of the child participants (n=13) indicated the archaeology summer camp engaged them (n=7) and under half of them did not report

anything that would indicate the archaeology summer camp engaged them (n=6). All adult participants indicated the archaeology summer camp engaged them (n=3).

Observation guides provided chances to directly observe who engaged who in archaeology and how. When child participants engaged adults in learning about archaeology, they tended to prefer showcasing their previous knowledge about the archaeology at Highlands Micro School. Having had experience with archaeology through Highlands Micro School before the summer camp, most of the child participants were more familiar with the archaeological record and its relation to the community's past than adult participants. It appeared as if child participants were trying to show off what they knew to adult participants. Their knowledge helped adult participants learn about the project and archaeology, while also giving child participants the chance to work as teachers in certain cases. Examples of sharing previous knowledge by child participants occurred when they found new artifacts in the excavation unit. Child participants used this as a jumping off point to start talking about archaeology with adult participants.

This fits within Moe's (2019) research on teaching archaeology within pedagogy. She believes that working with material culture and the archaeological record promotes more engagement within students rather than hypothetical instances. Archaeology also impacted learners more when they were connected to it in some form. It appeared that this engagement impacted child participants, but they also appeared to share this impact with adult participants as they transferred their knowledge about these artifacts to their older classmates.

Adult participants exchanged their own previous knowledge of archaeology with child participants. Although their experiences did not focus on archaeology at Highlands Micro School, child participants still liked learning about this information, as exemplified by 013, who stated “[they] did like adults being [there because] they [are] helpful... [Like]... they [might] know [about archaeology] like [006 and their parent, 014].” Adult participants’ previous knowledge of archaeology seemed to engage child participants in some instances.

Adult participants primarily engaged child participants in learning by promoting discussion about inferences and questions relating to Highlands Micro School’s past. Creating inferences and questions about what participants found while excavating helped in the learning process, prompting participants to think more about what they excavated. Some child participants took to this learning, as indicated by 002: “...[adults listened] better than most of my peers and asked me more questions and overall, it worked better.” One of their classmates (006) also wrote that learning with adults “is helpful because my [parent] teaches me different [than] Nick.”

These different teaching processes, question-asking, and inference-making by adult participants appeared to have engaged child participants in learning about archaeology. Creating these instances of engagement have the possibility to contribute to child participants’ learning. However, in my research, this can only be hypothesized after observing engagement between adult and child participants and cannot be tested due to the lack of a control group.

Intergenerational Communication

Throughout the educational process at the Highlands Micro School Archaeology Summer Camp, I focused on observing participants and analyzing their journals or write-ups for examples of intergenerational communication. To determine how intergenerational education impacted the ways in which participants perceived archaeology, I had to ensure that adult and child participants were communicating and learning with each other.

While intergenerational communication did occur during the summer camp, at times participants interacted within their generations. Brian Brunst and I had to attentively observe the participant population for when they would interact intergenerationally. Adult and child participants primarily did so through archaeological excavation, group work, or artifact analysis when interacting together.

Intergenerational communication started to appear more often as participants engaged with the excavation portion of the summer camp. Sometimes this interaction would start with child participants as they would engage adult participants using the previous knowledge they had gained through archaeology lessons at school or through the artifacts they would find.

Intergenerational communication continued as adult participants would start to ask more questions and make inferences with the child participant. They would continue to bounce these questions and inferences off of each other, almost serving as learning conduits for the other.

These interactions appear to relate to a concept that Mannion and Adey (2011:37, citing Rickinson 2001) mentioned in their research on place-based education called “unilateral direction of effects.” Based off research done in environmental education, this concept focuses on one generation influencing the other towards a line of thought or certain behaviors. In this case, adult and child participants engaged the other generation in different ways to encourage learning about archaeology. However, in this research, such a concept can only be observed briefly through the interactions between participants.

Similar intergenerational communication occurred during research and activities designed to teach archaeological practices. Participants asked questions and made inferences between each other, pooling their knowledge to complete tasks revolving around such lessons as the “Great Garbage Mystery” (Appendix C). This exercise presented participants a chance to make inferences about objects found in a modern-day garbage bin to help stimulate artifact analysis.

Finally, during artifact analysis, one adult participant (022) aided a child participant (020) in artifact analysis after they had been separated into groups to answer certain questions about the objects found during excavation. While they knew their goals for analysis, some friction did occur as 022 tried to properly teach 020 how to use the lab equipment. This, and 022 aiding in describing the artifacts, is a form of knowledge exchange and friction occurring between generations. Since different generations think differently about a topic at hand due to such things as cognitive development (Kolb 2015), it seems that friction would occur within intergenerational communication at one

point or another. Even after this friction occurred, they continued learning with each other without any intervention.

Child participants referred to questions or questioning from adult participants when I read through their journals. For example, 002 stated adult participants listened “better than most of [their] peers and asked [them] more questions.” This follows the observations reported above where intergenerational groups engaged through inference-making and questioning.

Other child participants felt adult participants engaged with them through encouragement and aiding in their learning process. One child participant (005) stated as such, mentioning that one adult participant (009) was “very encouraging and... encouraged other people.” These child participants appeared to believe this encouragement helped in their learning processes, considering adult participants as sources of aid.

Adult participants saw their role in intergenerational communication differently and similarly from child participants. One adult participant (014) felt they held a more supervisory position as a learner in the learning experience, even though they enjoyed the opportunity to engage with archaeology and learn about something they had been interested in since they were a child.

However, while they saw this as a way to better supervise child participants’ learning, other adult participants became more interactive in the learning experience itself. Both 007 and 009 took active roles in learning with child participants. The former participant

(007) made sure to take notes for their write-up with their child, allowing both of them to review what they had learned about archaeology at the summer camp. Reviewing their collective knowledge on the subject would allow participants to re-engage with learning at a later time outside of the camp. The latter participant (009) stated how they and their child learned about the subject together, giving them “the chance to dig a little deeper and enhance [their] knowledge.” Their views of intergenerational communication place them and their child as co-learners, prompting the ability to answer and ask more questions. Open dialogue on archaeology and the history of Highlands Micro School, in the words of 007 and 009, further incorporates learning permeability between the two generations (Mannion and Adey 2011). Such permeability allowed them to work together to expand upon their knowledge of their shared community past.

Learners Controlling Learning

In a learning environment, learners have a “need to be active and in control” (Hood 2018:10). This concept helps in creating a place where learners can control how they learn about the subject material presented to them. Within intergenerational education and learning of archaeology at Highlands Micro School, I found this theme occurring during observations and in participants’ journals or write-ups. Based on research conducted by Hood (2018), this theme focused on what learners did to make their learning environment more favorable to them.

Child participants would talk with Brunst and I about Highlands Micro School’s past at the beginning of the camp. This started to occur after our first few days there. They primarily discussed this subject with us to share their own thoughts on what the past at

their school may have looked like. At the same time, they had previously engaged with the archaeological record when they had first excavated their backyard and through lessons with Ms. Rove. Using this past knowledge, they engaged with Brunst and I to learn more from us, while also exchanging inferences and questions between each other. Through group and teacher-child interaction, these child participants controlled their learning to better understand their school's past.

Intergenerationally, child participants were left to decide who they wanted to engage with as the summer camp continued, with some choosing to interact more with adult participants than others. How adult and child participants engaged each other intergenerationally, as stated in previous sections, led to participants making strategies for learning as a group in some instances. For example, participants analyzed some of the material culture they excavated. Once they understood what was expected of them, they decided what tools to use, what objects they wanted to learn about, who would be in charge of measuring, and who would be in charge of describing the material culture for their analysis. Learners openly controlled who they learned with and how they would engage with archaeology and analyze material culture.

Some of the child participants focused primarily on their decision to learn with adult participants rather than their classmates and indicating why. A child (002), in writing their opinion on intergenerational education and learning, indicated how adult participants "were more [on their] level than most of the kids." One child (006) stated they learned differently from their parent; another child stated (013) they might learn something else from other adults. These child participants indicated that learning with

adult participants could provide them with different learning opportunities. They felt they could gain more knowledge, receive more informed learning with adult participants, or be challenged.

Something interesting that appeared in one child participant's (015's) journal was their statement on learning with adult participants. They stated, "I told [them what] to do and [what we] were looking for. We pointed [artifacts] out to each other." What appears to occur here is the child participant taking control of their learning through teaching the adult participant about the archaeological record and methods they used at the summer camp. This fits within the research by Hood (2018) I previously referenced. Her study focused on college students rather than elementary students but can apply to how people can learn through teaching. This interaction indicates an instance of learners teaching others about what they have learned or are learning.

Adult participants appeared to have a similar approach on controlling how they learned about archaeology with child participants. One adult participant (009) seemed to be describing their role as a co-learner with their child. They stated how "[learning together]... helps me to learn new information directly from [my child], when [they teach] me about various things [they've] learned from the day or several previous days" and "[they]... like raising related questions that [they] and/or I may not know the answers to." Here, 009 seems to be developing this idea of co-learning where they and their child switch between learner and teacher. This concept of learning through teaching can help in improving upon retaining what learners have learned. Taking turns as learner and teacher

provides some information on how intergenerational education works in public archaeology.

Archaeology

Over the course of three weeks, participants engaged with their school's past and became involved in archaeology. They all had their own thoughts on archaeology and what it meant to them, showing different levels of engagement. Analyzing what participants took away from this camp and how they interacted with it can provide an idea of their interaction with archaeology in an intergenerational setting.

By the end of the excavation portion of the archaeology summer camp, I started noticing that participants remembered previous teachings that related to archaeological stewardship. While brief and few, small instances of stewardship had occurred during excavation as participants remembered to leave some artifacts where they found them. Participants started to understand they had to carefully excavate artifacts before removing them near the end of excavation.

When uncovering isolated find (IF) 1 at the east side of the school, one of the children (010) excavating it near the end of the day (for mud pies) brought the artifacts to show me what they had found. While this seems counterproductive to stewardship, I reminded them of keeping these objects in place for future research and people to see artifacts like those they brought me. It provided a chance for further teaching, but 010 did take charge of the situation after that, showing me where they found the artifacts, allowing me to record their location. Afterwards, 010 closed up the hole where they found IF 1,

informing their classmates that no more digging would occur in that area while the summer camp continued.

These brief instances of care for the archaeology involved with their school could have connections to the participants' community past instead of a collective stewardship of all archaeology. However, noting these shifts in attitude towards protection of archaeological sites and materials could lead to broader, more improved ideas of stewardship. This is just speculation and would require a more involved research project over a longer period of time.

Based on further observation, archaeology and excavation stimulated continuing conversations revolving around the two subjects. As mentioned under previous themes, discussion occurred between different generations as they made inferences and created questions between themselves revolving around artifacts and excavating a part of their school. Observing the way in which participants interacted with their school's archaeology can only provide so much information on their perceptions of archaeology. Analyzing participants' own words about the topic shows their perceptions of the field. In most cases, participants showed an understanding and engagement with archaeology, but some participants did not.

Many child participants showed that they engaged with archaeology in some way. Reviewing how child participants defined archaeology in the *What is Archaeology?* worksheet (Appendix C) helped to discern if they had created their own brief, general definition of archaeology over the course of the summer camp. Their own definition provided answers about how they perceived archaeology as they participated in the camp.

Some created a more anthropological definition of the field, such as 002 who defined archaeology as “the study of [hominids]” or 006 who defined it as “the [study] of humans and how they lived.” Other child participants connected archaeology to the past. One child (016) defined archaeology as “the study of [ancient] humans and technology.” They also focused on the material culture and artifacts excavated from archaeology sites. This included defining archaeology as the “study of human material” (005 and 012). Finally, child participants would focus on the actions conducted by archaeologists, namely “digging” (004) or stating an archaeologist “[digs]” (011). Different definitions of archaeology indicate child participants created their own ideas about the field.

Journal entries provided insight into child participants’ thoughts about the subject and what they had learned. Many child participants recited what they did that day, sometimes using detail to showcase what they had learned about archaeology, such as 002 during the summer camp’s lab-themed week:

Then we journaled and took notes and measurements of the objects we observed. My group, [which] included [016], [013], and myself did the bag with the metal. Most of the pieces had rust. There was a penny, [which] I did and a few pieces with rust are also in my journal. I did a little piece of metal, [which] looked like a crowbar and two [wires]. If you would like to check these out, see on pages 23 to 26.

They provided a detailed recollection of what they did, showing their involvement and some concentration on engaging with archaeology. Another participant (005) followed this pattern:

Today, I learned how to properly make a digging site. This is how you make a digging site. How you make a digging site is first you have to make a grid. Then you have to measure first to have the grid measured correct. Then you have to make sure the grid is straight. Then you put string around it. That's how you make a proper digging site. Digging site = unit.

Here, 005 used “grid,” a vocabulary word from the Week 1 Word Bank, which showed some retention of the material. They also made sure to indicate that “digging site” means “unit,” a vocabulary word from the Week 2 Word Bank (Appendix C). Being able to use these words in their journaling while also relaying this information through their writing gave an impression of their thoughts on archaeology and how they perceived what they did.

However, while some of the child participants engaged with archaeology, some felt more disengaged from it as they learned. For example, while short, during one of their first days of the summer camp, 001 wrote in their journal, “And now I’m writing... and I do not know why.” During their first interactions with archaeology, they seemed to lose engagement as they participated. They were not the only one to feel disengaged from learning about archaeology. Another child (017) answered a question from the *What is Archaeology?* worksheet that asked them to “List the steps an archaeologist might take when he or she studies an archaeological site.” Answering the question, 017 wrote “[s]urvey, make a plan, work work work.” Not mentioning steps such as excavation, lab work, or research indicated some lack of engagement with the learning material.

Many of the child participants did perceive archaeology as an interesting subject and wrote extensively on their moments of learning during the summer camp. Some of the child participants showed, through their writing, that they were not as engaged or did not have positive perceptions about archaeology.

Out of the three adult write-ups I received, only two of the participants showed their engagement with archaeology. The first participant (014) mentioned their particular interest in archaeology, specifically writing:

I've been very interested in archaeology since I was a kid; but I've only fed this curiosity through visits to museums. So the opportunity to participate in field work was very exciting. I found that working on this project alongside my [child] and [their] classmates to be a very engaging first taste of archaeology.

They very intently stated their interest in archaeology and their excitement about the opportunity to engage with the field. While not as forward with their excitement of archaeology, another adult participant, 007, did engage with the field outside of the archaeology summer camp with their child. They discussed their own ideas and reviewed what they had learned about archaeology over the course of the first week. Instances like this can indicate that continued learning occurred after participants left Highlands Micro School for the day.

Perceptions of Intergenerational Education/Learning

Understanding the participants' feelings on their experience of learning with other generations was necessary for my research. Knowing how participants felt about this

teaching method can help in determining if it would be worth further research. To properly analyze the presence of this theme in my thesis research, data collection was limited to child participants' personal journals and adult participants' write-ups.

At the end of their time at the summer camp, I asked child participants to describe what they thought about learning with adults and write their thoughts in their journals (Appendix C). Many child participants' perceptions of intergenerational education and learning tended to be positive. Some of them mentioned that adult participants promoted further questioning, inquiry, and listened to children. I referenced some child participants' perceptions of learning with adults in my section on intergenerational communication. By expanding upon 015's quote from my section on learners controlling learning, they described one of their experiences with adults:

...[I] told [them what] to do. Yesterday it was also fun to sift and talk with [009]. I told [them what] to do and [what we] were looking for. We pointed [artifacts] out to each other. Those are some reasons why I liked them including adults in camp.

First, these responses indicate that intergenerational learning occurred as generations exchanged information through questioning. Adult participants made sure to learn from child participants rather than become teachers, in the case of 015. Second, participants engaged with their school's archaeology intergenerationally and appeared to learn from each other. Again, child participants provided information about the site to adult participants by showing them what to do and working to uncover artifacts.

Another child participant (006) claimed “that learning with adults didn’t influence [their] learning in this camp because they were just students like [them].” This participant saw adults as students, creating a connection between the two generations and establishing a similar role in the learning process between the adult participant and the child participant. Establishing these connections can help create a sense of permeability (Mannion and Adey 2011), allowing the opportunity for learning to flow back and forth between generations.

Some child participants were unsure of how they felt about learning with adults. A child (015) wrote “[I’m] not [really] sure because the two times I worked with adults it just [made] it a bit more fun.” Another child (001) wrote “I don’t know my [feelings] about the adults coming in,” but followed this with “it’s cool that adults [can learn] and get the [experience] to do the stuff they have not done.” These child participants seemed unsure about learning through intergenerational education. They had positive words to attach to learning with adults in some comments but did not know how to feel about learning with adults in other comments. Intergenerational learning is a concept that can be difficult to understand if only exposed to it briefly. Unfortunately, this confusion may further extend itself to archaeology, as one of the children (001) seemed more confused and disengaged from learning about the field itself when I read the rest of their journal.

Another child (013) wrote “it did not change the way I think ok,” when referring to learning with adults. Before that, they also wrote “I did like adults being in here [because] they [are] helpful... They [could learn] like [everyone] did!” It appears that this child participant liked learning with adults but did not think they changed the way they

learned about archaeology. Many of the child participants appeared to have positive feelings about intergenerational education and learning, but some wrote conflicting accounts or did not have positive feelings about them.

Of the three adult write-ups, two mentioned their own views on intergenerational education and learning. Both had positive views about the education method. The first adult participant (014) believed that fieldwork provided a good opportunity for adults and children to learn with each other. They further state that adults and children worked as a team and that working with children

...fosters an element of wonder... [the] project was highly effective in that it had active learning opportunities for both children and parents, and the combination enhanced the impact of the experience.

This participant positively perceived learning with child participants, a perception matched by another adult participant (009). They continue to focus on the opportunities to exchange information between the two generations:

Through the process of my [child] teaching me new things [they've] learned, I think it's a good opportunity for [them] to deepen [their] own understanding of the subject matter by reviewing it in [their] own mind and trying to clearly communicate that new information. In the moments when I may know a little bit about the subject matter already, it can allow me to potentially refine [their] understanding of some of the gaps in [their] new knowledge.

Both adult participants expanded upon the learning process they experienced and what both generations received after introducing intergenerational education as the primary teaching method at the archaeology summer camp. Permeability between learners in an intergenerational setting was present as the participants focused on the idea of learning between adults and children. Open communication between generations was something 009 mentioned when describing their experience, while 014 mentioned an “element of wonder” and the enhanced impact that came from such an experience.

While not wholly representative of the entire participant population, these perceptions do indicate a more positive trend towards learning about archaeology intergenerationally. Of course, some child participants exhibit unsureness about learning with adults, possibly affecting the learning process. Even so, the participants’ responses provided me a chance to understand their perceptions of intergenerational education and learning.

Community Engagement

Both intergenerational education (Manion and Adey 2011 quoting M. Sánchez et al. 2007) and public archaeology (Mapunda and Lane, 2014) focus on community. This connection between the two fields indicated that I had to consider what would happen within the community as I proceeded with my research. For that reason, community engagement has become an increasingly bigger part of my thesis research as I have proceeded with my data analysis. This theme, in relation to Highlands Micro School, first came to my attention during chi-squared testing between the pre- and post-surveys.

Question 5 of the survey asked, “How important is archaeology to your community?”, providing me a question that could quantitatively gauge community engagement to a

degree. Although chi-squared testing did not show significant differences between individual pre- and post-survey question scores, I found that this question had the biggest difference between scores when I totaled all participants' answers for question 5 alone (Appendix B). Question 5's pre-survey score (n=57) was higher than the post-survey score (n=46), reaching a difference of -11. When the pre-survey score was normalized for chi-squared testing (n=57.2511), the difference did not change considerably (n=-11.2511). This negative difference between scores indicates a more positive shift in attitude over time when considering the community's connection to archaeology.

It must be recognized here that community can be a very powerful and complicated term in archaeology. Community is scalar and can apply at many different levels such as local or international communities. In my thesis, I recognize that my informants may be thinking of community in different ways and my research may vary in how it applies to each community. Furthermore, I recognize that participants may belong to many communities, these communities are, in some cases, defined in my research by me, and the term community can extend past a local context (Pyburn 2011).

Over the course of the archaeology summer camp, I observed how participants interacted with each other and the school's community archaeology they had become inherently involved with as they participated in the archaeological process. Child participants facilitated discussion amongst themselves about the archaeology of their school at the beginning of the camp. To stimulate this conversation, we asked child participants to think about the future archaeology of their school (Appendix C): what would archaeologists find at Highlands Micro School two hundred years from now to

determine if it was a school? This jumpstarted thinking about archaeology in relation to their community. Participants came up with ideas for objects at their school that could become future archaeological objects, including remains of the slide, shovels, wood chip inclusions, graphite from pencils, and child-sized chairs. This exercise, based off a similar lesson from Smith et al. (1996), stimulates community connection through context, making it more personal to the individual participants.

Promoting this idea of personal connection to their school, participants would work together to excavate the unit beneath their play equipment. Excavation allowed the intergenerational participant population to interact with the school's archaeological record. This prompted adult and child participants to start asking about the artifacts they found and what it told them about the past. Participants interacted with each other intergenerationally through the community-based archaeology. They engaged with members of their community intergenerationally to better understand Highlands Micro School's past.

Participants' own words on community helped determine its role within the Highlands Micro School Archaeology Summer Camp. The *What is Archaeology?* worksheet asked child participants to 'Draw a picture of an archaeological site or describe it.' One child (003) described archaeology as "[Highlands Micro School] under the play [structure] in a hole." This description indicated this particular child participant connected archaeology to Highlands Micro School, their own community. An idea of community in relation to archaeology has developed here.

Participants described working with people as “a team” (002) or they recorded how they perceived intergenerational learning, stating that adults “[could learn] like [everyone] did! I [also talked] to my mom and dad about [archaeology] and overall I had a lot of fun with the adults!” (013). One adult participant (014) further expanded upon this by stating,

I also like raising related questions that [they] and/or I may not know the answers to. It gives me the opportunity to show an example of a curious mind. To encourage further questioning of subject matter and discuss what resources we can tap into to investigate further. It gives us the chance to dig a little deeper and enhance our knowledge.

This sense of inclusion falls within the definition of intergenerational education used in the introduction of my thesis research, where a sharing of “knowledge and resources” and providing “mutual support” is present (Mannion and Adey 2011:37 quoting M. Sánchez et al. 2007:35). It appears that community participation and knowledge-sharing is occurring between intergenerational participants as they interact with the school’s archaeological past.

At other times, participants referred to their work with their school’s archaeology and past, rather than working with other generations or participants. At one point, participants conducted brief research into the school’s past through historical resources (Highland United Neighbors Inc., 2019; Highland Historical Society n.d.) and analyzed the material culture they had excavated. One participant (020) stated the reason for this exercise,

focusing on hypothesizing the “number of people [present] and [their] lifestyle.” Their words focused more on the objects they excavated and history they researched to learn about their school’s past. This indication of community engagement serves more as an example of how participants engaged with the archaeology connected to their school in reference to the definition of public archaeology used in Chapter 1 (Mapunda and Lane 2004:212;214). Participants engaged with the community in both the past and the present, creating personal connections to archaeology.

Research Question 2

Research Question 2 asked, “How do children learning alongside adults affect the way in which both parties learn about archaeology in a museum setting?” This question focused more on qualitative findings rather than overarching quantitative changes in perception of archaeology. While this research site provides less information than its counterpart, themes still arose while I observed participants.

a) What words do participants use to describe archaeology after participating in the exhibit?

I utilized Question 15 from the Highlands Micro School Archaeology Summer Camp survey at the History Colorado Center (Appendix B) when introducing the Amache Garden Archaeology Exhibit to the museum’s visitors. I relabeled this question as Question 2 for the survey I used during this portion of my thesis research. How participants answered this question would provide a base understanding of how the intergenerational audience at the History Colorado Center viewed archaeology through

the words or phrases they used after interacting with the Amache Garden Archaeology Exhibit.

Participants answered Question 2 of the survey, “What five words would you use to describe archaeology?” They chose their answers from 15 words: dirt, digging, fun, educational, dinosaurs, bones, needed, unneeded, cultures, people, artifacts, exploring, treasure, ruins, and caves.

After participants interacted with the exhibit, they primarily used these 5 words to describe archaeology: artifacts (n=15; 16%), digging (n=13; 14%), educational (n=12; 13%) and cultures (n=12; 13%), and people (n=10; 12%). Results are represented in a chart (Figure 14):

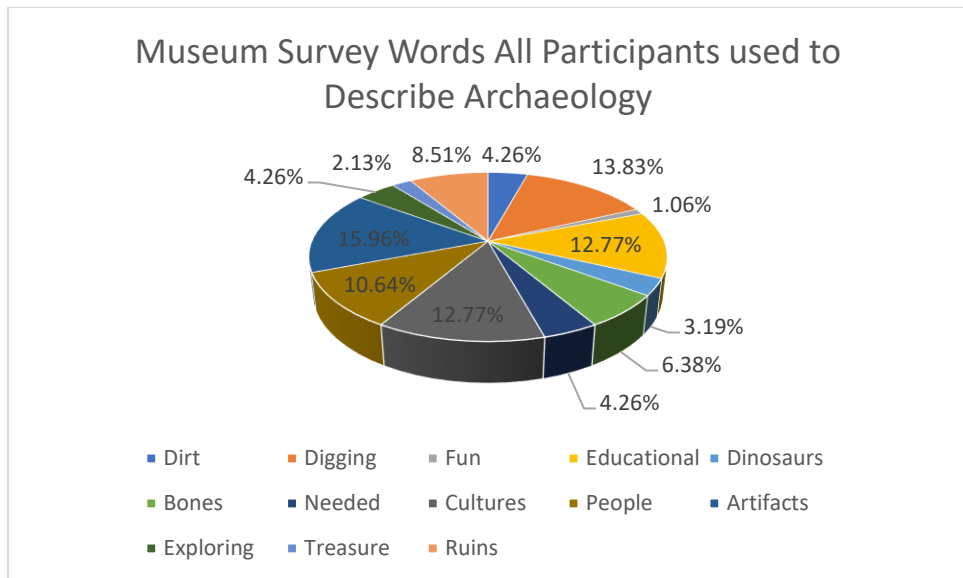


Figure 14: A chart of the words the History Colorado Center visitors chose to describe archaeology after interacting with the exhibit

Participants tended to use words directed more towards excavating objects in archaeology (artifacts and digging were the two words most participants used (n=28;

29.79%)). Not many people concluded that the word dinosaur describes archaeology (n=3; 3.19%) and no one chose the word unneeded to describe archaeology. Other words more people used to describe archaeology included ruins (n=8; 8.51%), bones (n=6; 6.38%), and needed (n=4; 4.26%) and dirt (n=4; 4.26%).

Participants answered the survey after they interacted with the exhibit. Due to outlined limitations, it needs to be understood that the exhibit may have impacted participants' answers to the survey. I cannot know that for sure without a pre-survey.

b) What observations can be made about adults and children interacting together to learn about archaeology?

I only used observation guides and field notes to gather data from participants as they interacted with the Amache Entryway Garden Archaeology Exhibit. Compared to the data analysis of the Highlands Micro School Archaeology Summer Camp, the data analysis from the History Colorado Center will be brief and only cover observation guides and fieldnotes.

Unlike Highlands Micro School, I could only analyze five themes at the History Colorado Center: engagement, intergenerational communication, learners controlling learning, archaeology, and community engagement. Lack of written responses from museum visitors prevented me from properly analyzing or observing participants' perceptions of intergenerational education/learning.

Engagement

Engagement varied depending on a participant's generation and with whom they had visited the exhibit. Adult and child participants approached me separately in some cases. They approached me together in other cases, either participating with the interactive portion of the exhibit, engaging me with questions about the exhibit and archaeology, or both.

Adult participants tended to speak with me about the project when engaging with the exhibit by themselves. They took advantage of someone accompanying the exhibit that could provide more information on the topics connected to it. Adult participants wanted to expand upon their knowledge, adding to what they already knew about Japanese American internment and Colorado history. Some adult participants would engage in more critical discussion about Japanese American internment, Amache, and archaeology. These instances included their own knowledge exchange with me as they shared what they knew about the topic, while other participants connected the past with the present by talking about current events. Adult participants tended to engage only with me and not with the interactive portion of the exhibit.

Child participants spoke to me to receive background information on archaeology, Amache, and Japanese American internment when they engaged with the exhibit by themselves. They would then participate with the interactive portion of the exhibit in most cases (Appendix D). At other times, they would pay attention to my teaching about archaeology before disengaging from the exhibit. However, more child participants

engaged in learning through the interactive exhibit and my teachings rather than sharing their own knowledge.

Adult and child participants interacted with the exhibit differently when they engaged with the exhibit together. Participants engaged with me to initiate their experience. Some groups of adult and child participants continued their engagement through the interactive portion of the exhibit. This would lead to discussion or inference-making led by adult participants. They created questions and further learning after I provided a brief introduction of the exhibit. Engaging in discussion while they participated in the interactive portion had the potential to provide more learning opportunities for both generations.

Some adult and child participants only engaged with me as I provided more information about the topics revolving around the exhibit. This would lead to further discussion and knowledge exchange as I interacted with the adult-child pair. However, they also chose to only speak with me, forgoing the interactive portion of the exhibit.

Participants also engaged each other differently. Adult participants walked over to the exhibit and spoke to me about it, while the child participants in their group followed them to learn. This would sometimes lead to child participants engaging with the interactive exhibit and sometimes it would not. Child participants would usually engage with me to discuss the topics revolving around the exhibit and what they could learn from it. Other interested younger visitors would interact with a child participant to share in this engagement. Adult visitors would also come over, interested in what the child visitors

were doing and wanting to learn more about it. Participants engaged each other in the exhibit but did so in different ways depending on their generation.

Intergenerational Communication

Intergenerational communication is something that occurs often in museums. One does not have to be an anthropologist or archaeologist to sit down and watch a familial group of visitors interact with an exhibit together. Although this is the case, I found little research on intergenerational education or learning within museums. Perhaps it is just an assumed phenomenon that occurs within a museum setting, or perhaps the lack of community connection in some cases prevents it from being researched more.

The Amache Entryway Garden Archaeology Exhibit provided a good opportunity to study intergenerational communication, education, and learning at museums from an observational point-of-view. It provided different modes of learning that promoted group education through the interactive portion of the exhibit. While adult participants did not interact with this portion of the exhibit alone, child participants did and that sometimes encouraged older learners to join them.

As referenced in the previous section, a child participant would encourage an adult participant to join them; an adult participant would create further discussion, questioning, critical thinking, or use previous knowledge to further engage a child participant in the educational experience. This has the potential to make their time learning with the exhibit more rounded and meaningful to them, creating a sense of permeability that tells both generations they can learn together (Mannion and Adey 2011). This is based off

observations. A more extensive survey and more inclusive research could provide better data for analysis.

While intergenerational communication did stimulate learning, it also disengaged participants from the exhibit. An adult or child participant would sometimes walk away towards another exhibit, prompting the other participant to disengage from the exhibit. Visitor disengagement should be expected as there are many different exhibits for a visitor to see before they leave.

Learners Controlling Learning

Visitors chose how they would like to interact with and learn from the exhibit. The Amache Entryway Garden Archaeology Exhibit provided different ways for different visitors to learn. They could either engage with the interactive portion of the exhibit, discuss the topics revolving around the exhibit with me, or both. How they engaged with the exhibit was left for them to decide, allowing them to choose how they could best learn from their experience.

Adult participants primarily chose to learn from me and what knowledge I had about topics such as archaeology, Amache, gardens, palynology, and Japanese American internment. This would sometimes lead to further discussion as adult participants shared their own knowledge on the topics with me. They could also choose whether to discuss these topics with me alone, with another adult, or intergenerationally with a child.

Child participants chose whether or not to participate in the interactive portion of the exhibit when alone. If they interacted with the exhibit, then they also chose whether they

wanted to participate with the exhibit by themselves or in a group. One group of child participants even decided to treat the interactive portion of the exhibit as a competition to see who could finish the quickest and who interpreted it better. Other times, they would decide to continue to talk with me about the interpretive portion of the exhibit. Many also showed me their interpretations of the entryway garden after they had finished, wondering how their work compared to what the garden may have actually looked like based on my knowledge of the exhibit.

Who participants learned with appeared to impact how they engaged with the exhibit and myself. When adult and child participants learned together, adult participants would sometimes engage with the interactive portion of the exhibit. As adult and child participants interacted with the exhibit together, older visitors would reword some of the information I shared for the younger visitors. Knowledge translation helped clarify what participants were able to take away. Learners taking control of learning is a topic that should be explored further in museum archaeology research. Further exploration into this topic could contribute to understanding how different generations of learners learn in the same setting and creating exhibits that can engage intergenerational audiences.

Archaeology

Participants displayed varying levels of interest in the field of archaeology. Some child participants did not fully grasp what archaeology was, but adult participants connected it to a shared past knowledge to further explain it to younger visitors. Adult participants created this connection to better help child participants in their learning process as they interacted with the exhibit and me. This would help promote exhibit

interpretation. As stated previously, sometimes the pair would continue discussing the topic with me to learn more about archaeology.

Adult participants who came by to speak with me appeared to want to primarily discuss the topic of Amache and internment archaeology. This would provide them a chance to share what they knew about the internment process and the field, promoting knowledge sharing about archaeology. Older visitors showed a curiosity about archaeology and wanted to learn more from someone who has had experience in the field.

Child participants interacted with the exhibit. Some did not know what archaeology was at first, but I gave a general explanation of the field to better inform them about it. They engaged with the activity to the best of their learning capabilities (participants ranged in age and education level). At the end of their time learning from me, it was difficult to determine how they perceived archaeology after learning about it. It appeared as if they were interested in the activity and possibly learned more about archaeology by engaging with the exhibit.

I observed one instance where a child participant did engage with me to discuss the archaeology of internment and its relation to the exhibit. This discussion indicated that they showed an interest of some kind in the past and archaeology. Their continued discussion with me also engaged more child participants in the interactive portion of the exhibit. This one child participant's interest in archaeology extended to other child participants, promoting shared learning about archaeology through engaging with the exhibit.

Community Engagement

Community engagement occurred in much smaller groups. Most visitors kept to themselves and the people they visited the museum with, possibly creating intergenerational groups but keeping most instances of community engagement within said groups. Considering the public space of a museum, this makes sense, as people are going to tend to stay with families or short-lived tour groups. However, different instances of community engagement outside of intergenerational communication still occurred: such as relations to Amache or Japanese American internment; or connecting the internment process to current events.

No former internees visited the exhibit. However, during one of the last days the exhibit was up, some participants came by and discussed what they knew about Japanese American internment after learning about it from friends and family. They shared some of the stories that they had heard from those they knew who were interned. By doing so, they shared their connections to the community and their engagement with it.

Outside of Amache, visitors made connections to the American community as a whole. During the time of this study, the confinement of Mexican American children along the Texan-Mexican border was occurring. One participant, an adult, connected Amache to current issues, bringing the past to the present. A different form of engagement occurred here, but it included community connections. While it did not occur as I thought it would, participants who visited the exhibit created instances of community engagement in different ways.

Research Question 3

Research Question 3 asked, “What differences, if any, are there between the impact of archaeological intergenerational education at Highlands Micro School and the History Colorado Center?” Because two different participant populations were a part of this research, this question focuses on the same learning method not the same participants. I used only three kinds of data for comparison: the words both populations used to describe archaeology *after* participating in my research; and the qualitative and quantitative analysis of emerging themes that arose from my time at each research site.

Survey Questions 2 and 15

I crafted the surveys at both research sites to include the question, “What five words would you use to describe archaeology?” I used these data to create a brief comparison between the words participants at Highlands Micro School used in the post-survey (Figure 13) and the words participants used at the History Colorado Center to describe archaeology (Figure 14) to contribute data that helps support the thematic comparisons between research sites.

Briefly examining the descriptive statistics, participants appeared to have provided similar answers. However, two words did show a bigger difference in choice by participants between research sites.

The first word is bones, which showed a 3.38% difference between Highlands Micro School (n=3 or 3%) and the History Colorado Center (n=6 or 6.38%). This could be due to the common misconception that archaeologists study dinosaurs, which also saw a

2.19% difference between Highlands Micro School (n=1 or 1%) and the History Colorado Center (n=3 or 3.19%).

The second word is fun, which showed the biggest difference of 10.94% between Highlands Micro School (n=12 or 12%) and the History Colorado Center (n=1 or 1.06%). This likely stems from the hands-on experience participants at Highlands Micro School received through the archaeology summer camp. This may also include the differences in connections to community and the extended education process participants at Highlands Micro School received.

Participants would need to provide more input to explain why they chose these words to support these assumptions. Extended data analysis would also need to occur to determine significant differences between the words participants chose. For this research these data will be used to support the quantitative and qualitative thematic comparisons I make in the following sections. After I examined these descriptive statistics, I used chi-squared testing to determine if any significant differences occurred between research sites.

Chi-Squared Testing

To conduct chi-squared testing of themes between research sites, I counted the codes used in my thematic analysis and placed them each within a relevant theme(s). I tallied the codes for each theme (n=5) for both sites and used chi-squared testing to compare them (Table 6; see Appendix F for test).

My hypotheses for the chi-squared testing are as follows:

H₀: There is no significant difference between the frequency in appearance of each theme between research sites.

H₁: There is a significant difference between the frequency in appearance of each theme between research sites.

Table 6: Frequency of appearance of codes within each theme when comparing observation guides between Highlands Micro School and the History Colorado Center

	Engagement	Intergenerational Communication	Learner Controlling Learning	Archaeology	Community Engagement	Total
HMS OG	27	111	68	60	75	341
HCC OG	18	67	37	28	52	202
Total	45	178	105	88	127	543

Using chi-squared testing to compare the frequency in appearance of each theme between research sites shows that no significant difference exists. When comparing the χ^2 (n=3.43) to the critical value (n=9.49) with a confidence interval of 95% ($\alpha=0.05$) and 4 degrees of freedom, the χ^2 value from chi-squared testing shows a lesser value, indicating no significant difference. This lesser value indicates that the null hypothesis cannot be refuted. There is no significant difference between the frequency in appearance of each theme between research sites. I further compared the themes using a form of comparative thematic analysis.

Comparative Thematic Analysis

This comparative analysis followed the same format as in Research Questions 1e and 2b. I will use the gathered observation guides and five of the six themes I analyzed

(engagement, intergenerational communication, learner controlling learning, archaeology, and community engagement) for comparison between research sites. Due to the nature of my observation guides and lack of personal write-ups or interviews at the History Colorado Center, I will not be comparing perceptions of intergenerational education/learning between research sites.

Engagement

Engagement with archaeology occurred at both research sites. This is where I saw similarities between Highlands Micro School and the History Colorado Center. It appears that child participants are starting engagement with adult participants through interacting with the activity at-hand at both sites. Adult participants continued this engagement through questioning, discussions, and inference-making revolving around their interactions with the learning material and child participants. This included knowledge sharing and intergenerational cooperation to learn more about archaeology. Creating an initial engagement with the material (child participants) and then expanding upon that initial engagement through learning together (adult participants) creates a setting for intergenerational education and learning to occur.

However, it must be noted that I saw more obvious instances of disengagement by participants leaving the exhibit at the History Colorado Center earlier due to either an adult or child visitor guiding them towards another exhibit. I believe this can be attributed to the setting of the research site and the type of learning that occurred.

Intergenerational Communication

Differences in intergenerational communication occurred in child participants when referring to observation guides. At Highlands Micro School, it appeared that child participants engaged adult participants more through knowledge sharing and wanting to teach them about proper archaeological techniques and the community's past. This made it appear as if child participants were teaching and learning at the same time. At the History Colorado Center, child participants appeared to encourage adult participants to join them in the interactive portion of the exhibit, creating a joint-learning experience rather than knowledge sharing.

Similarities in how adult participants from both sites created intergenerational communication through questioning, creating discussions, and inference-making occurred. While child participants used different methods at different research sites to share in and create a learning experience with adult participants, the latter instead similarly focused on using these experiences to promote further learning about archaeology.

Learners Controlling Learning

The nature of the engagement opportunities presented to participants at the two research sites created different instances of learners controlling how they wanted to learn about archaeology. At Highlands Micro School, participants controlled their learning through choosing who to learn with and how they wanted to share or contribute knowledge to better their learning opportunities. At the History Colorado Center, learners primarily controlled their learning by deciding how they wanted to interact with the

exhibit. The former lesson-based learning experience provided a more controlled learning environment for participants. The latter experience utilized an exhibit, providing a less controlled, less strict learning experience that promoted fluidity in learning depending on factors such as interest, age, groups, and time. Participants took control of their learning differently depending on the environment and experience.

Archaeology

What people took away from archaeology at their respective research sites can be considered different due to the connections participants formed with the learning material, the connections participants formed with their fellow learners, the archaeology participants interacted with, and the length of the learning experience. Participants at Highlands Micro School had a more hands-on experience with archaeology and one that incorporated the archaeology of their community, giving them the opportunity to create more personal connections with the experience. Participants at the History Colorado Center had a hands-on experience, but a less rounded one that lasted over a considerably shorter period of time than the Highlands Micro School Archaeology Summer Camp. However, the limitations of these observation guides must be acknowledged here: they provided information on how participants interacted with the archaeology, not their perceptions of it. Data from Questions 2 and 15 will provide information on participants' perceptions of archaeology in the discussion of this theme's comparison in Chapter 7. The location of research sites impacted how the intergenerational participant groups learned, particularly through the archaeology they learned about and how they learned about it.

Community Engagement

Community engagement was different between sites due to participants' connections to their communities. At Highlands Micro School, adult and child participants, part of their local community, interacted with each other and the archaeology of their shared community on a daily basis. This led participants to wonder about their school and its connections to Highlands' past. Accessing this previous knowledge and working closely in and with their school's community allowed participants to create connections between their community and archaeology. As stated previously, I saw a change in how participants perceived their connections between their community and archaeology. Creating these connections falls within the definition I used for public archaeology (Mapunda and Lane 2004) and intergenerational education (Mannion and Adey 2011 quoting M. Sánchez et al. 2007). Furthermore, while this would need a longer, more inclusive research project, there is potential here to stimulate an overarching sense of stewardship of the past amongst communities (Clark 2017; Horning 2013; Moser et al. 2002).

Community engagement occurred on different levels at the History Colorado Center. People made connections to friends or family who belonged to the Amache or Japanese American internment communities, or connections to the current state of the country. While not significant, when conducting chi-squared testing between codes within observation guides, and considering codes involving intergenerational communication as community engagement, more instances of community engagement occurred at the History Colorado Center than Highlands Micro School. However, that should be

expected as adult and child visitors interacting at museums happens quite often due to the public nature of these institutions, thus creating a familial community engagement. Encouraging participation in archaeology between adult and child visitors can allow for better interaction within museums that can stimulate group engagement (Colwell 2017; Merriman 2004).

The community past participants interacted with was different between research sites. Learners at Highlands Micro School interacted with their local and school's past, allowing for a more personal appreciation of said past to develop. Most visitors at the History Colorado Center interacted with a past that ties to more scalar levels of community, creating different methods to engage with the past that may depend on a community identity that ranges from family to state to nation.

Summary

The data gathered in this chapter is broad and covers different parts of my thesis. I will bring the above sections back together to better synthesize a discussion about my findings. Doing so will return my research and readers to the beginning of my thesis where I stated my main goal. What follows is a chapter discussing my data in a way that aims to answer the questions stemming from my main goal through synthesizing my findings and results. This discussion will also include how my thesis research fits within the broader frameworks of intergenerational education and public archaeology.

Chapter 7: Discussion of Findings and Results

This discussion will continue from Chapter 6 and synthesize my findings and results. I will bring the quantitative and qualitative data together to answer my research questions while also fitting my thesis research within the broader frameworks of intergenerational education and public archaeology. I want to use these data to create a discussion that returns to the main goal of my thesis: understanding if intergenerational education can change participants' attitudes towards archaeology, and where and how archaeologists can best use this teaching method when engaging the public in archaeology.

Research Question 1

The paired comparison t-tests showed that no significant differences occurred between the averaged question scores or averaged participant scores when comparing pre- and post-surveys. These data show that no significant differences occurred in how participants viewed the archaeology they interacted with when in an intergenerational setting during the Highlands Micro School Archaeology Summer Camp.

Comparing adult and child participants' pre- and post-survey scores in Research Question 1c using two-sample independent t-tests showed that no significant differences occurred between adult and child participants' pre- and post-survey scores. What makes these tests interesting is that adult and child participants' scores are not significantly

different after they answered the pre-survey. This means that adult and child participants' attitudes towards archaeology are similar before the summer camp. Wallace (2008) references similar ideas about people having an intrinsic interest in the past, particularly through the archaeological record. Participants would continue to access this interest during camp as they interacted with the material culture and developed their own ideas about the field, referencing a form of materiality (Taylor 2006).

Moe (2019) provides further context as to why adult and child participants' have similar attitudes towards archaeology. Moe's research showed that archaeology interested students more when they had a personal connection to it. When I apply her research to both generations, I can see that these personal connections already existed within the community. Adult and child participants already have these shared thoughts because they have been asking questions about archaeology, interacting with the archaeological record, discussing the topic with parents, and visiting institutions such as the University of Denver (DU) Department of Anthropology. These factors could explain why there is no significant difference between adult and child participants' answers to the pre-survey.

I conducted a similar two-samples independent t-test with adult and child participants' post-survey scores and saw that no significant differences occurred between these surveys. However, I saw that the t-stats are different between pre- and post-surveys. While the pre-survey t-stat equaled 0.6082, the post-survey t-stat equaled 0.1161, creating a difference of -0.4921. Neither t-test showed significant differences occurring between participant populations, but this difference in t-stat shows that adult and child

participants' answers to the post-survey are more similar to each other than their answers to the pre-survey.

It is also interesting to note that the average adult participant score for the pre-survey t-test (n=23.6667) was higher than the average adult participant score for the post-survey t-test (n=23). The average child participant score for the pre-survey t-test (n=22.2857) was lower than the average child participant score for the post-survey t-test (n=22.7143). Lower scores indicate a more positive attitude towards archaeology based on these surveys. Based on average pre- to post-survey scores, adult participants' attitudes towards archaeology became more positive over time, while child participants' attitudes towards archaeology became less positive over time.

This 'balancing shift' within an intergenerational setting could indicate that adults and children are impacting each other's ideas about archaeology while also approaching a more similar attitude towards the field. This relates to community engagement which has been prevalent in intergenerational education (Mannion and Adey 2011 quoting Sánchez et al. 2007:35), public archaeology (Mapunda and Lane 2004), and my thesis research. The permeability between generations mentioned by Mannion and Adey (2011) fosters intergenerational education and appears when comparing pre- and post-survey scores between generations.

A balancing shift across generations also relates to the idea of intergenerativity posited by George et al. (2011:392). Here lies an exchange of ideas that is moving "across [created] boundaries" that tend to separate generations. Analyzing these data outside of calculating significant differences made me think about how generations

impact each other's learning as they share ideas. Adults and children have the potential to impact each other's learning processes and knowledge sharing as they approach a more unified view of the field, possibly influencing the other generation's collective attitudes towards archaeology.

I analyzed qualitative data to further understand how intergenerational education appeared as adult and child participants engaged each other in learning about archaeology. It appears that child participants at Highlands Micro School created intergenerational communication through sharing their previous knowledge and the artifacts they found with adult participants. Adult participants created more critical discussion and questioning regarding archaeology in response to child participants. The unilateral direction of effects referenced by Mannion and Adey (2011:37 quoting Rickinson 2001) occurred here. One generation influenced the other through their different methods of intergenerational communication. The changes exhibited between the pre- and post-surveys two-samples independent t-tests represent this influence quantitatively. Bringing these data together with qualitative data provides information on how participants created intergenerational communication and if it had any effect on participants.

Furthermore, referencing their written responses, adult and child participants appeared to have positive attitudes towards their constructed learning environment that created critical discussion, questioning, and inference-making. Some child participants appeared confused or not interested in learning with adult participants. However, the participants' overall attitude towards intergenerational communication appeared positive.

Literature on intergenerational education states intergenerational practices (IGPs) are meant to create a setting that promotes benefits for generations that work and learn together (Martin et al. 2010). Participants created a knowledge-sharing environment, one where members of both generations participate as learners within the learning process. Because these benefits occurred during camp, I believe that IGPs can work well within community and public archaeology settings. These data support an argument for developing archaeology programs that use this teaching method. However, future research would also require a comparison between a control group and an intergenerational group of learners within the same educational setting.

Intergenerational communication relates to the themes of learners controlling learning, archaeology, and community engagement. Learners have the opportunity to better control their learning by choosing who learns with them in an intergenerational setting. They can decide whether they want to create an atmosphere of education with other generations or participate in learning with members of their own generation. Intergenerational education provides a way for learners and students to create their own ideas about the material and what they want to contribute to others' learning processes.

Having control of their learning environment allowed learners to choose how they learned with others. This included child participants having the ability to teach adult participants about their previous knowledge of archaeology and the Highlands Micro School Site; or adult participants opting to become co-learners and students rather than teachers when learning alongside child participants. If learners have the ability to teach, then they have opportunities to better retain subject matter (Hood 2018). Literature on

intergenerational education and learning also references co-learning as occurring in and defining IGPs (Kaplan 1994; Mannion and Adey 2011; Martin et al. 2010; Springate et al. 2008; The TOY Project 2013; Vieira and Sousa 2016; Watts 2017). Instances of intergenerational education and learning occurred while adult and child participants controlled their learning.

Participants used archaeology as a vehicle for conversation and learning about Highlands Micro School. Based on qualitative and quantitative data, adult participants tended to view archaeology favorably and had some interest in the field before participating in the summer camp. Child participants tended to have similar views and previous knowledge from their lessons on archaeology and Highlands' history; however, some child participants appeared unable to connect with their community's archaeology.

Participants' answers to Question 15 of the pre- and post-survey provide further data on how they viewed archaeology through the words they used to describe it. Participants tended to choose the word artifacts to describe archaeology in both the pre- (n=13; 13%) and post-surveys (n=16; 16%). This word, cultures (pre-survey n=12; 12%; post-survey n=12; 12%), and digging (pre-survey n=15; 15%; post-survey n=11; 11%) are all related to the archaeological record and the past that is connected to Highlands Micro School. Combined with participants' previous knowledge, their choices hint at the importance of using material culture as a way for adult and child participants to learn together. Adult and child participants working with the archaeological record intergenerationally may contribute to further engagement with the past. These data are related to Moe (2019) and Wallace (2008) when considering the educational and public interest in material culture.

They would also incorporate a public learner interaction with materiality (Taylor 2006) and engagement in experiential learning (Kolb 2015). This idea would require more research, but these findings do support incorporating material culture handling when learning about archaeology through intergenerational education.

Based on the words participants chose in the post-survey, they appeared to start understanding that there is more to archaeology than digging. Using the excitement of excavation may have stimulated the participants' interest in material culture and their past. This appeared in how participants used artifacts they unearthed to initiate intergenerational communication and learning, but this communication also shifted ideas about archaeology away from digging. Seeing this shift in attitude matches one of the three standards Colonial Williamsburg's used to summarize their interactive program, DIG! Poole (2019:108) describes the program's "focus on what can be learned through the whole of the archaeological process, rather than on digging." Promoting a public view of archaeology that extends outside of popular culture and digging is one of the main goals noted by other educational archaeology programs. However, it must be noted that further data and analysis is needed to properly test for significant differences in relation to Question 15.

Question 5 in the survey was concerned about the community's connection to archaeology. This question's score decreased the most from pre- to post-survey after I conducted chi-squared testing on individual question scores (Appendix F). This difference between the surveys indicates that participants' thoughts on community's connections to archaeology changed positively after the summer camp. Participants

described themselves working as a team or enjoyed working with the participants from other generations, while one child participant called an adult participant ‘a student.’ Highlands Micro School has a pre-constructed school community that is based around students, teachers, and parents working together to learn. This sense of community and its connection with the school’s past seemed to impact how everyone learned about archaeology.

The qualitative data indicate how this happened through the participants’ interactions with each other and their engagement with archaeology. Participants created their own sources of support within their local community that appeared to impact their attitudes towards archaeology. Having personal connections (Moe 2019) to the archaeology impacted participants’ interest and expanded community ties, stimulating their thoughts on “community responsibility and resourcefulness” (Kaplan 1994:48) in regard to archaeology. Highlands Micro School created a unique setting where pre-established community ties could develop, and participants could engage with the archaeology tied to their school’s past. Previously cited literature revolving around intergenerational education and public archaeology, and my thesis research indicate that a community-engaged intergenerational educational setting may have the chance to impact a learners’ archaeological experience. When bringing this teaching method and public archaeology together, one of the tying themes is community, further supporting the use of intergenerational education when communities engage with their past’s material culture together. Intergenerational education may prove a useful teaching method in future community archaeology projects.

Research Question 2

As I focused on observing participants interacting with the Amache Entryway Garden Archaeology Exhibit at the History Colorado Center, it appeared that intergenerational communication occurred frequently. Museums and exhibits provide places for public discussion and outings between adults, children, families, friends, and other groups where there are pre-established relationships. It made sense to see generations learning with each other if they are visiting the museum together.

I wanted to be able to observe these interactions when adult and child museum visitors came to interact with the exhibit. Participants had the chance to engage with it in different ways to better their learning experiences. Their ability to choose how they could learn appeared to impact how generations interacted with each other.

Child participants would engage other children or adults in the interactive portion of the exhibit. They used this method of learning to encourage adult participants to engage with the interactive portion of the exhibit when it appeared that adult participants would prefer to avoid the garden map when visiting the exhibit alone. This stimulated intergenerational communication and education that promoted a different mode of learning for adult and child participants. Adult participants would interact with child participants to create more critical discussion and questioning about the exhibit. Incorporating this method of learning into visitors' engagement with the exhibit could impact what they learn about archaeology. These processes of creating and answering questions revolving around archaeology follows research that has done the same through

archaeological experiential learning with the public (Riley 2019) and forms of mentoring as intergenerational work (Watts 2017).

The opportunity for learners to choose their learning to stimulate intergenerational communication can provide new educational opportunities for both generations. While the topic of permeability is accessible and on-going at the exhibit (Mannion and Adey 2011), it only forms a part of the intergenerational educational process. The ability to choose how to learn and who to learn with in an intergenerational setting provides different learning opportunities connected to archaeology. Yet at the History Colorado Center, this is more prevalent because of the various ways visitors can engage with Amache's garden archaeology.

This exhibit is a small-scale instance of providing different forms of learning, engagement, and programming to appeal to an intergenerational audience and push for that permeability to occur as older and younger museum visitors interact together. This programming is more often separated by age and generation that includes adult supervision or less adult inclusion within archaeology and museums (Corbishley and Dhanjal 2019; Zarmati and Frappell 2019). For example, Lavra Fabjan and Petra Stipančić (2019) created and tested different archaeological programs for children of varying ages at a museum in Slovenia. Because of this focus on separating museum visitors into programming by age museum programmers created learning opportunities, better engaged different age groups in learning about the past, and researched the programs' impact. These programs prove beneficial in being able to slowly build up an understanding of archaeology within younger visitors. However, I would say that this

takes away the permeability of learning between generations and removes the unilateral direction of effects present in museums that can impact intergenerational learners.

As exemplified by my research with the Amache Entryway Garden Archaeology Exhibit, creating this intergenerational permeability and unilateral direction of effects allows for new learning opportunities for older and younger museum visitors. Adult participants are able to engage in an exhibit with a child, participating in an experiential method of learning that urges them to examine the imitated garden through an archaeologist's eye. Child participants are able to engage in an exhibit with an adult, participating in discussion, questioning, and inference-making based on previous knowledge. Children may also learn better through different teaching methods when learning with adults. I would argue that museum programs could take ideas such as simulated digs (Corbishley and Dhanjal 2019; Zarmati and Frappell 2019) or real excavation experiences, such as Magic Mountain or Crow Canyon, and offer intergenerational programming that allows learners to choose how they learn. What I propose would need further testing to wholly justify it. Even so, I believe that creating exhibits, programming, or experiential education in archaeology and museums should provide choices for learners to expand upon their learning opportunities with members of other generations.

Determining museum visitors' attitudes towards archaeology while interacting with the exhibit required that I directly observe participants. Adult participants used archaeology as a vehicle for conversation with me. They particularly wanted to exchange their knowledge of what they knew about the field and the internment process, while

learning further information about both topics as they discussed them with me. Adult participants are teaching while they are learning, informing me about their previous knowledge and expanding upon it. They also share this information with children when learning with them. Child participants focused on the interactive portion of the exhibit, engaging with it to the best of their abilities while trying to engage friends or adults in the exhibit. Hood (2018) states that if participants taught the material they already knew, then they would better retain and learn from it. It also allows for “timely feedback on their efforts” (Hood 2018:2). I reference this research here because I want to recognize the appearance of learners learning while they teach in an intergenerational setting. Exhibit participants have the opportunity to further learn about the past through engaging in discussions with each other and with someone who knows the material.

I turn to Question 2 from the museum survey to further continue this discussion on the theme of archaeology at the History Colorado Center. Museum participants used words that primarily related to excavation and material culture to describe archaeology. Participants answered Question 2 by primarily choosing artifacts (n=15; 15.96%) to describe archaeology, followed by digging (n=13;13.83%). Choosing these words seem to indicate that participants consider archaeology to be related to material culture. While museum visitors did not interact with physical material culture like summer camp participants at Highlands Micro School, they chose similar words to describe archaeology. The public seems to find the little remnants of the past that archaeologists excavate to be the most intrinsic part of their careers (Wallace 2008). The Amache Entryway Garden Archaeology Exhibit did not provide interaction with artifacts from the

Amache site. Museums could change this in future programming. Now that we know that intergenerational populations attribute artifacts to archaeology, it may be a good idea to incorporate interactive exhibits that promote different generations to work together to interact with a faux archaeological record, such as replicated archaeological material (Merriman 2004).

Community engagement appeared in different forms at the History Colorado Center. When including intergenerational communication under community engagement and using chi-squared testing, participants appeared to engage with community at the museum more than at Highlands Micro School. This makes sense as museums offer public settings for families, tour groups, and friends to engage with each other and learn about different subject matter. That appeared during my research with the Amache Entryway Garden Archaeology Exhibit. These brief instances of community engagement between generations, when they knew each other, created active dialogue that allowed different members of different generations in smaller groups to present their “views and values” on archaeology and the past (Kaplan 1994:55). Outside of intergenerational communication, community engagement occurred through instances of familial or friendly connections with former internees who have informed them about Japanese American internment or participants who connected the internment process to the present. Adult participants primarily created these connections. However, if applied to a more comprehensive program and a more intergenerational audience, then older and younger generations may be able to exchange views and ideas about the past and its role in the present. This idea would require a more incorporative and cooperative museum program

that could extend past a brief interaction with one exhibit. If Kaplan's (1994) research indicates that generations come together to share their ideas and views when learning with each other, then it could be applied within archaeological programming in museums.

Research Question 3

To compare both research sites to each other I had to bring together the data from Research Questions 1 and 2 to analyze the differences and similarities that arose between research sites. Comparing intergenerational education between research sites is limited. However, I want to provide what information I can when examining the use of intergenerational education in a formal education setting versus using intergenerational education in a public education setting.

There are few differences between the words participants used to answer Question 15 after the archaeology summer camp and Question 2 after the exhibit. This indicates that participants tended to have similar thoughts on archaeology after participating in either the archaeology summer camp or interacting with the Amache exhibit. Participants primarily described archaeology using words that pertained to excavation – artifact and digging (n=27% at Highlands Micro School and n=29.79% at the History Colorado Center). Further similarities emerge in the third most chosen word to describe archaeology by participants: culture (n=12% at Highlands Micro School and n=12.77% at the History Colorado Center).

These answers may pertain to previous knowledge about archaeology and that it has to do with the past and the material culture. They may also pertain to the hands-on, experiential learning opportunities with which participants engaged. I had to use a shorter

survey at the History Colorado Center to better account for the brief visiting-time visitors had with different exhibits. I could not see if the Amache exhibit actually impacted their ideas about archaeology or provide a more comprehensive survey like I did at Highlands Micro School.

Bones (a difference of 3.38%) and fun (a difference of 10.94%) saw the biggest differences between research sites. More participants chose bones to describe archaeology at the History Colorado Center than at Highlands Micro School, which could relate to a greater number of participants choosing dinosaurs (n=1% at Highlands Micro School; n=3.19% at the History Colorado Center) to describe archaeology at the History Colorado Center. More participants chose fun to describe archaeology at Highlands Micro School, which could relate to the more hands-on experience that participants had during the archaeology summer camp. This relates to Wallace (2008) and Moe (2019), and how people tend to have a bigger interest in archaeology when including the tangible material culture and personal connections to the past.

It would be interesting to see if similar shifts in attitude towards archaeology away from the idea of digging would occur in more comprehensive programming at a museum, as Poole (2019) describes. It would also be interesting to see if more participants found archaeology fun and related it less to bones if museum visitors had access to a setting similar to an archaeological site or hands-on material culture.

During this research, participants at both sites focused on the material culture and the past connected to it when describing archaeology. Highlands Micro School participants appeared to shift away from describing archaeology as digging, while the History

Colorado Center participants described archaeology as digging after interacting with the exhibit. However, participants at the History Colorado Center only provided answers to their surveys after interacting with the Amache Entryway Garden Archaeology Exhibit. Participants at Highlands Micro School provided answers from before and after participating in the summer camp. Only a small part of the surveys can be compared between sites and more data is required for me to comfortably conduct statistical comparisons. I would need further data for comparison. So, I turned to the qualitative data I collected from observation guides.

Intergenerational communication occurred at both sites which allowed participants to stimulate intergenerational education and learning. Where adult participants created settings for further questioning, discussions, and inference-making at both research sites, child participants approached intergenerational education differently. Highlands Micro School child participants preferred engaging adult participants through knowledge sharing and interacting with material culture from the archaeological record, using it as a way to engage their older classmates. The History Colorado Center child participants preferred to engage other participants (adults and children) in joint-learning that promoted group engagement.

Child participants at Highlands Micro School preferred to engage with adult participants as learners and teachers, wanting to share the knowledge they already knew. Encouraging this type of learner engagement between different generations in a field setting may help in promoting more learning opportunities where participants can act as teacher and learner when engaging with the archaeology. This can bring together

different ideas that could help participants learn from each other (Hood 2018). Without access to material culture, child participants at the History Colorado Center would either engage their guardian in the exhibit, be engaged by their guardian in the exhibit, or approach the exhibit together with their guardian. It appears that they approach exhibits ready to learn jointly with those in their group, which can promote intergenerational communication. This has the chance to promote mentoring (mentioned as a form of “intergenerational work” by Watts (2017:46)) through joint-learning rather than creating a teacher-student relationship. This comparison can provide educators an idea of how to promote intergenerational learning within public archaeology depending on the educational setting and how participants may view learning with other generations at said setting, relating to place and landscape theory (Bender 2006).

Learners controlled their learning within these different educational settings. Highlands Micro School participants engaged with planned lessons. This allowed participants to more freely choose who they would learn with amongst their fellow learners, including whether or not they learned with other generations. The History Colorado Center participants engaged with an exhibit, allowing them the opportunity to participate in a more informal public educational experience about archaeology. Participants could choose how they learned, allowing them chances to bring other learners from other generations into their learning method. Both research sites promoted intergenerational education and learning, contributing to the use of this teaching method in public archaeology. However, participants chose their learning in different ways.

Learners controlling their learning can provide them different ways to obtain knowledge of the subject matter within lesson-based education. The same could be said about participants choosing what method of learning to participate in and encouraging other learners to join them. At both research sites, I saw that learners controlling their learning or being allowed the opportunity to control their learning creates situations where different generations can learn from each other and in ways they did not expect. It is providing these opportunities within a fluid or semi-fluid learning environment that allows permeability to flow through the boundaries that generations sometimes erect between each other (George et al. 2011; Mannion and Adey 2011). Researchers should include the ability for learners to have a hand in how they control their learning when conducting future intergenerational education within archaeology.

I have already partially examined how intergenerational groups of participants at different research sites described archaeology. This provides a basic understanding of the ways intergenerational communities describe archaeology between sites. While not significant, archaeology was the theme that had the greatest difference in frequency between research sites during chi-squared testing (Appendix F). The theme of archaeology appeared more at Highlands Micro School than at the History Colorado Center. Once more, I believe this relates to the sites themselves where participants engaged with archaeology differently. This further hints at the differences in participants' attitudes when it comes to site location and how learners within both generations may prefer the wholly tangible experience over the simulated experience.

Participants' connections to the communities they engaged with differed between sites. Highlands Micro School participants had the ability to learn from each other and the past when they engaged with their school community's archaeological record. The History Colorado Center participants had more chances to interact intergenerationally with those around them but participated in a simulated archaeological experience where visitors interacted with a past they connected to on different scalar levels.

When including intergenerational communication as a part of community engagement, I did note that community engagement did occur more frequently at the History Colorado Center. This likely relates to the public nature of museums that encourages familial communities to learn together through various exhibitions. I also noted that more instances of intergenerational communication occurred at the History Colorado Center than at Highlands Micro School, although these differences in frequency are not significant. A public place that promotes more informal learning simultaneously promotes more intergenerational engagement than a private educational setting. Museums have the opportunity to expand upon these interactions between older and younger visitors through programming and exhibits aimed at multiple generations.

I noticed differences in how community engagement occurred between research sites. Participants at Highlands Micro School directly interacted with their community in different ways. These connections helped stimulate participants' thoughts and ideas about the past connected to their school community. Creating these connections can foster an appreciation of the past that has the potential to develop into further ideas of overall archaeological stewardship. I once again reference unilateral direction of effects

(Mannion and Adey 2011:37, quoting Rickinson 2001) where different generations within a community have the potential to impact these attitudes towards preserving archaeological resources. There is potential for educators to use the ideas of intergenerativity (George et al. 2011) and intergenerational education to encourage participants to make connections to the past through community and collaborative archaeology and develop these connections into a more inclusive sense of stewardship.

The preestablished ties that participants had to each other and their past drove my research at Highlands Micro School. I primarily observed instances of community engagement with Colorado history or within families at the History Colorado Center. Few instances of community connection to Amache or Japanese American internment occurred. The group interactions I noticed that occurred between museum visitors is something that should be promoted. Encouraging discussions between museum visitors (Merriman 2004) and creating collaborative environments (Colwell 2017) can stimulate community engagement on a smaller scale. Museum programming that focuses on archaeology directed towards multiple generations and recognizes the different community identities that bring learners together may stimulate community engagement on a larger scale.

Both research sites promoted community engagement. However, I believe that the Highlands Micro School Archaeology Summer Camp created a place for participants to create closer connections to the past and stimulate a want to interact with or protect said past. Stimulating this sense of local community between generations may provide opportunities for different teaching methods that include older and younger generations,

allowing them to influence each other's learning about their past. The History Colorado Center promoted a place for people to discuss different aspects about the past and its connections to the present from different points-of-view. Community engagement occurs differently depending on group dynamics, community identities, and relationships with the past made tangible by the exhibit.

Promoting community engagement in intergenerational education in public archaeology is a necessity for this teaching method to work. The location itself has the potential to shape learners' views or attitudes towards the past, indicating that the scale and purpose of community engagement should be shaped to fit the education process for the learning community as needed.

Summary

This discussion of my findings and results analyzes all the data I outlined in Chapter 6 to better understand intergenerational education's place when engaging the public in archaeology. By creating this discussion, I wanted to support the main goal of my thesis and make an argument for future research and incorporation of intergenerational education into community and collaborative archaeology. Through conducting this thesis research, I examined the attitudes of intergenerational communities towards learning about archaeology in different settings. I have discussed my findings in this chapter and how they are related. I move towards my conclusions and possibilities for further implementation of this teaching method in future public archaeology programming in Chapter 8.

Chapter 8: Conclusion

My thesis research revolved around engaging participant populations in learning about archaeology using intergenerational education. I had to make connections that promoted intergenerational communication throughout the process. My time with participants varied from site to site, age to age, and interaction to interaction. The two research sites encouraged participants to engage with archaeology and create discussion, questions, and inferences between themselves as they learned. Intergenerational education inherently includes members from different age groups, many of whom came together with an interest in archaeology that they wanted to explore. Different sites and generations prompted me to think carefully about how to craft educational instruments and approach the varied learners that participated in my thesis research. It came to a point where I had to act as educator, ethnographer, and excavator at times. Sometimes I had to encompass all three roles at once and sometimes I had to switch between them quickly. Through it all I created those connections that are needed between an educator and a learner. I used these connections to provide a place of education for adults and children.

The Highlands Micro School community provided a site where I could expand upon the past that students, parents, and teachers could all connect to in some way.

Encouraging a permeable and transferable setting for archaeological knowledge to flow

from adult to child and vice versa created a research site for intergenerational education. Adults and children could promote learning about archaeology between themselves after learning from me. They also excavated Unit 5E/2N in their backyard, allowing them the opportunity to visit their school's past. Archaeological educators should consider these opportunities within community, collaborative, and public archaeology. Archaeologists should become educators at research sites where engaging the affected community in archaeology would be applicable and appropriate.

The past is something many people are interested in and encouraging those personal connections with it through interacting with a field site or artifact has the potential to promote archaeological stewardship and learning. What archaeologists should realize is that engaging communities in archaeology need not teach them everything about their past, but instead promote protection of the past and continued learning. I wanted learners at Highlands Micro School to see that and interact with it in their own way. I believe this group of intergenerational learners did that as they participated at the Highlands Micro School Archaeology Summer Camp.

Brian Brunst and I have analyzed and inventoried the artifacts excavated at Highlands Micro School from before and after the summer camp. I returned the artifacts to the school so that they can continue learning from the material culture connected to their community. I also created a brochure (Appendix D) to disseminate the information I learned from Highlands Micro School to students and parents. Ms. Rove, Ms. Wintemute, and Highlands Micro School will receive copies of my thesis, artifact inventory, and site

report to provide resources for future programming in archaeology and intergenerational education.

The History Colorado Center was different from Highlands Micro School in many ways. I promoted a form of education through an exhibit that connected with few participants on the same level as the field site at Highlands Micro School. Most participants learned about another community's archaeology, which provided different opportunities to learn about the past. Including different ways to engage with archaeology also provides educational opportunities that visitors can access within a museum setting. This can create discussion between visitors, including intergenerational communication, in a public environment.

The Amache Entryway Garden Archaeology Exhibit provided different learning opportunities for museum visitors and created a setting for discussion about the past, archaeology, and sensitive topics such as Japanese American internment. It is important to promote these ideas when presenting archaeology to the public and it creates a setting where visitors can learn together with people from varying backgrounds. This includes intergenerational groups with parents, grandparents, children, guardians, and so on. Discussions between generations can set the stage for one influencing the other.

I left the Amache Entryway Garden Archaeology Exhibit at the History Colorado Center for the museum to use to promote education about Amache, Japanese American internment, palynology, and archaeology. I returned to the History Colorado Center on February 16, 2020 during the Day of Remembrance to bring the exhibit out for internees and their families. Visitors interacted with the exhibit and I met with members of the

Japanese American community. The exhibit continued to promote discussion about the archaeology and history revolving around internment and Amache. The History Colorado Center cares for the Amache Entryway Garden Archaeology Exhibit now so that they can feature it alongside their Amache Barrack Exhibit. They will also receive a copy of my thesis to provide an overview of visitor's reactions to the exhibit and ideas on incorporating intergenerational education into their museum programming.

The findings from this research appeared to answer my research questions and accomplish my thesis's main goal. Research Question 1 involved Highlands Micro School and its participant population. The data I analyzed provided information on intergenerational education within both a private institution and community setting. Participants' attitudes did not significantly change based on the survey data I gathered; however, the data did show a balancing shift in perception of archaeology's importance to their community between generations and a more positive perception of archaeology. I observed participants and noticed the arising themes associated with intergenerational education in public archaeology; participants' personal write-ups contributed to these data. These themes provide base guidelines for what to examine when researching intergenerational education in a community archaeology setting. Finally, I believe the findings from my thesis research provide an argument for future use of or studies on intergenerational education in archaeology that involves community and collaborative participants.

That being said, applying the ideas of materiality and place and landscape theories to the present may not focus as intently on the past as archaeologists may want. However,

the way in which participants used artifacts to engage each other intergenerationally at both sites indicates that views of the past and views of the material are created through these interactions with material culture. Archaeologists not only need to pay attention to how past peoples may have viewed artifacts, but how present people outside of the field may view them today. Place also serves as a valid method of intergenerational education in regard to all three research questions when accompanied by place-based education (PBE; Mannion and Adey 2011). This particularly has to do with the idea of community and engaging a community with their past through a recreated faux archaeological excavation or through community members participating in archaeology. Community, as stated, is a broad term. In the case of place, focusing on locations more closely tied to a local community could provide better ways to utilize intergenerational education in public archaeology.

Research Question 2 involved the History Colorado Center and the visitors that interacted with the Amache Entryway Garden Archaeology Exhibit. There are weaknesses to my research at the History Colorado Center. Limitations prohibited me from creating a more comprehensive study of intergenerational education at an archaeological museum exhibit. That being said, I still believe that data from this site provided insights into learning between generations at a museum. Data revealed arising themes as they appeared through the observations I made. They also contributed to an understanding of ways an intergenerational audience would describe archaeology and provided the ability to conduct a comparison between research sites.

Breaking down ‘pragmatic imagination’ into ‘pragmatic’ and ‘imagination’ helps define where it can be used. Material culture, including analogous space (Küchler 2005), appears to have provided the best instances of said imagination. This plays out in how I saw participants handling and learning from the past through the Amache analogous space, and then applying their past knowledge and imagining what the past could have looked like. In this way, while not physically in the past, they can interact with material culture or a replicated place to create ideas about the past. Some ideas were created through intergenerational communication, possibly stimulating additional learning opportunities for participants.

I compared my research sites for Research Question 3 to understand what might promote intergenerational education using different methods and learning opportunities. The data compared in relation to this research question indicated the prevalence of intergenerational communication in a public setting over a private setting. I believe that incorporating archaeological intergenerational education in a museum setting using more elaborate museum programming such as experiential learning involving local archaeology (Fabjan and Stipančić 2019; Poole 2019; Riley 2019) or dig boxes (Corbishley and Dhanja 2019; Zarmati and Frappell 2019) may provide even better opportunities for generations to learn together and from each other. I also noted that similarities occurred between sites. These similarities usually referred to how the participant populations described archaeology or how adult participants learned with child participants. The data that I have compared could provide a starting place for

educators who are considering using intergenerational programming and lesson planning when teaching archaeology.

When applying experiential learning, I still hold that experience may be the best form of engaging intergenerational groups in learning together on the same level. One of the three models apply best to intergenerational education in my research. The Lewinian Model of Action Research and Laboratory Training can include a more short-lived experience, which works within archaeological experiences involving multiple groups of people. I also felt more comfortable applying such a model in more than one location because of its ability to be incorporated into varying lengths and methods of educational archaeology. Dewey's model would work in more elongated educational experiences, but I have noted the limitations such experiences can face, such as lack of older generation participation or preferred shorter timeframes in museums. I could only apply Piaget's model to the younger generations in my research, which would cut out older generations and nullify the intergenerational experience.

The theoretical frameworks I used impacted my research, while aspects of experiential learning may not have become as involved as I would have wanted. Analyzing the collected data contributed findings about how intergenerational education could work in public archaeology. Having briefly summarized my research and the findings regarding the relevant data, I provide two examples of possible topics to research in the future.

Future Research

My thesis research constitutes a case study involving two different types of sites that could possibly benefit from intergenerational education. That being said, I cannot determine if intergenerational education is fully responsible for certain aspects of the changes that I saw. These methods appeared to make some sort of impact on the intergenerational population, primarily at Highlands Micro School. To know for certain if that is the case, I believe that future research revolving around intergenerational education in public archaeology can use my thesis research, methods, and analyzed themes and expand upon this teaching method's application in archaeology. Such future research can include, but is not limited to:

Comparing Monogenerational and Intergenerational Teaching Methods

One of the limits and weaknesses within my thesis research was the small participant population at Highlands Micro School and the short amount of time museum visitors spent at the History Colorado Center. This prevented employing a control group to compare monogenerational education with intergenerational education. Future studies can use the findings from my thesis to frame a methodology and discern how and if my analyzed themes appear outside of my two research sites. Creating an environment within an educational or public institution where researchers can utilize control groups of monogenerational adult and child learners would provide a setting for comparison with intergenerational education. Researchers could then compare the survey data gathered from both groups of learners to determine differences and similarities, and if these effects warrant more intergenerational education in public archaeology.

Research on Intergenerational Education using Museum Programming

The History Colorado Center served as my research site for understanding intergenerational education when applied to a museum exhibit. In Chapter 7, I discussed researchers who have created programming around teaching the public about local archaeology (Fabjan and Stipančić 2019; Poole 2019) and using hands-on learning materials such as dig boxes (Corbishley and Dhanjal 2019; Zarmati and Frappell 2019). Future research could use some of these methods to understand if intergenerational education using hands-on learning materials outside of a community could work as it did at Highlands Micro School. Museums have the ability to be more accessible to different publics than field sites or schools. If educators can create the same connections and learning processes through more accessible programming, then intergenerational education can be applied to wider audiences. A project like this would require an expansion on the methods I used in my thesis research and a bigger participant population.

Concluding Statement

The past will always be an interesting topic of conversation for those who work within archaeology and for many who do not. Archaeologists should engage the public in conversations about the past and its connections to the present. It is a difficult line to walk for both sides as archaeologists need to stimulate interest in the past and the public needs to have a role in archaeology. These two groups can work without the other to understand the past, but sometimes an opportunity comes along where they can work together to better shape each other's views on what the past means to all of us.

Intergenerational education has the possibility to promote these learning opportunities between different generations and archaeologists. Community and collaborative projects have the potential to benefit from this learning method when including publics in archaeological work. I am not saying it is a teaching method that all archaeologists who engage with the public, educational, community, collaborative, and museum sides of the field need to use, but if the opportunity to use it presents itself, then they should consider it. Encouraging engagement within archaeology falls to both archaeologists and the public. Intergenerational education promotes opportunities for back-and-forth discussion. This teaching method breaks down the wall that separates generations while creating a permeable learning setting for generations to influence each other in different ways. This influence can impact younger generations as they will have the ability to impact how the nation views the different pasts that make up this country in the future. From the field to the museum, archaeologists, communities, the public, and generations are intertwined in creating a space to discuss, learn, and explore the past, not only through archaeology, but through each other.

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Appendix A: Assent/Consent Form

Highlands Micro School Adult Consent to Participate in Research Form

Study Title: From Field to Museum: Applying Intergenerational Teaching in Archaeology

IRBNet #: 1434092

Principal Investigator: Nicholas Dungey, M.A. in Anthropology Student at the University of Denver

Faculty Sponsor: Dr. Bonnie Clark, Associate Professor of Anthropology at the University of Denver

Study Site: Highlands Micro School, Denver, Colorado

Sponsor/Funding source: University of Denver

You are being asked to participate in a research study. Your participation in this research study is voluntary and you do not have to participate. This document contains important information about this study and what to expect if you decide to participate. Please consider the information carefully. Feel free to ask questions before making your decision whether or not to participate.

The purpose of this form is to provide you information that may affect your decision as to whether or not you may want to participate in this research study. The person performing the research will describe the study to you and answer all of your questions. Please read the information below and ask any questions you might have before deciding whether or not to give your permission to take part. If you decide to be involved in this study, this form will be used to record your permission.

Purpose

If you participate in this research study, you will be invited to help in understanding intergenerational teaching (teaching between adults and children) of archaeology.

The purpose of this study is to research how intergenerational teaching may impact participants attitudes towards archaeology over the course of week-long lessons at Highlands Micro School. Each lesson will focus on a different topic of archaeology each of the three weeks (survey, excavation, and lab). The study will follow the lengths of these week-long lessons.

Surveys will be given to fill out at the beginning and end of each week. They will be used to assess attitudes towards archaeology before and after the lessons begin. Questions will not be personal but will focus on asking such things as ‘How likely would you want to have archaeology incorporated more into school programs?’ or ‘How important is archaeology to you?’. You will then be asked how strongly you agree or disagree with these questions or statements. Direct observation of interactions and work being done between adults and children will also be done as the week progresses. These will be noted by me in my field notes, but will not include any direct identifiers.

You may refuse to answer any question or item in the survey.

Whether you participate in the research or not will not affect learning opportunities at the archaeology summer camp. However, during the time when the surveys will be given, a brief lesson on the archaeology of Highlands Micro School will be given to those who are not participating in the research.

Risks or Discomforts

There are no expected risks to you as a result of participating in this study. Lessons and participation will be overseen by Ms. Sara Rove, myself, and Brian Brunst. Adult volunteer participants will only be chosen from parents voluntarily giving their time and associated with students attending the Highlands Micro School Archaeology Summer Camp. Any safety measures and proper procedures for doing archaeology will be taught to the students as part of the lesson plans for each week.

Benefits

The possible benefits of participation are learning about archaeology in a setting that allows participants to learn using a site closely connected to them and have a better understanding of archaeological stewardship (the protection and respect of cultural material and archaeological sites).

Source of Funding

The study team and/or the University of Denver is receiving funding from the University of Denver Anthropology Department.

Photography Release

This study involves photography. If you do not agree to be photographed, you can still take part in the study.

_____ YES, I agree to be photographed.

_____ NO, I do not agree to be photographed.

Confidentiality of Information

Data collected will remain anonymous. Data will not be released to participants, however a public newsletter will be released on the archaeology summer camp to all participants once the study is complete and data has been analyzed.

Limits to confidentiality

Your name will not be used in any report. Participants will be assigned the generational label of ‘adult’ through answering the survey meant to be answered by adults. Digital files will be password protected and encrypted. Physical files will be locked away in a secure filing cabinet behind locked doors at the University of Denver.

The information that you give in the study will be anonymous. Your name will not be collected or linked to your answers.

Information collected about you will not be used or shared for future research studies.

The information that you provide in the study will be handled confidentially. However, there may be circumstances where this information must be released or shared as required by law. Representatives from the University of Denver may also review the research records for monitoring purposes.

Questions

For questions, concerns, or complaints about the study you may contact Nicholas Dungey, M.A. in Anthropology Student at the University of Denver, at **(214) 608-1636** or **nick.dungey @du.edu**, or you may contact Dr. Bonnie Clark, Associate Professor of Anthropology at the University of Denver, at **(303) 871-2875** or **Bonnie.Clark@du.edu**.

If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the University of Denver (DU) Institutional Review Board to speak to someone independent of the research team at (303) 871-2121 or email at IRBAdmin@du.edu.

Signing the consent form

I have read (or someone has read to me) this form, and I am aware that I am being asked to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Printed name of subject **Signature of subject** **Date**

Highlands Micro School Parent or Guardian Permission Form for Child's Participation in Research

Title of Research Study: From Field to Museum: Applying Intergenerational Teaching in Archaeology

Principal Investigator: Nicholas Dungey, M.A. in Anthropology Student at the University of Denver

Faculty Sponsor: Dr. Bonnie Clark, Associate Professor of Anthropology at the University of Denver

Study Site: Highlands Micro School, Denver, Colorado

Your child is being asked to participate in a research study. Participation in this research is voluntary and they do not have to participate. Your child may decline to participate or to withdraw from participation at any time. Withdrawal or refusing to participate will not affect their relationship with the University of Denver in anyway. You can agree to allow your child to be in the study now and change your mind later without any penalty. This document contains important information about this study and what to expect if your child participates.

The purpose of this form is to provide you (as the parent or guardian of a prospective research study participant) information that may affect your decision as to whether or not to let your child participate in this research study. The person performing the research will describe the study to you and answer all of your questions. Read the information below and ask any questions you might have before deciding whether or not to give your permission for your child to take part. If you decide to let your child be involved in this study, this form will be used to record your permission.

What if my child does not want to participate?

In addition to your permission, your child must agree to participate in the study. If your child does not want to participate they will not be included in the study and there will be no penalty. If your child initially agrees to be in the study they can change their mind later without any penalty.

Purpose of the Study

If you agree, your child will be asked to participate in a research study about intergenerational teaching (teaching between adults and children) when teaching about archaeology. Adults in this case will be parental volunteers of children from Highlands Micro School who want to participate in the summer camp. The purpose of this study is

to learn how adults and children learning about archaeology together changes attitudes about archaeology in a field setting.

What is my child going to be asked to do?

If you allow your child to participate in this study, they will be asked to:

- Answer pre- and post-surveys that ask what they think about archaeology, mainly the form of questions that ask how they agree or disagree with a statement. Any child who needs it will be read the questions for better understanding and their verbal answers recorded on paper (no open-ended or essay questions will be asked).
- Direct observations while adults and children work together will be made to understand how they interact together while they are participating in the lessons by myself and my research assistant, Brian Brunst, an B.A. in anthropology student at the University of Denver.

This study will take will take place during the weekly lesson at the archaeology summer camp and the surveys will be given before and after each week, while direct observations will be made hourly each day of adults and children interacting and there will be between 11-15 other people in this study each week.

What you will you be asked to do in the study?

If you agree to let your child(ren) participate in this research study, you will be asked to sign consent for your child(ren) to participate in this study. Since they will be attending the summer camp, you will also be asked to transport them every day to Highlands Micro School.

What are the risks involved in this study?

There are no expected risks to participating in this study. Lessons and participation will be overseen by Ms. Sara Rove, myself, and Brian Brunst. Adults volunteers will only be chosen from parents voluntarily giving their time and associated with students attending the Highlands Micro School Archaeology Summer Camp. Any safety measures and proper procedures for doing archaeology will be taught to the students as part of the lesson plans for each week.

What are the possible benefits of this study?

The possible benefits of participation are learning about archaeology in a setting that allows participants to learn using a sight closely connected to them and have a better understanding of archaeological stewardship (the protection and respect of cultural material and archaeological sites).

Source of Funding

The investigator is receiving funding from the University of Denver Anthropology Department.

Photography Release

This study involves photography. If you do not agree to allow your child to be photographed, they can still take part in the study.

_____ YES, I agree to allow my child to be photographed.

_____ NO, I do not agree to allow my child to be photographed.

Alternatives

If your child does not participate in this research, then they will be taught a short lesson on the archaeology that was found at Highlands Micro School by Brian Brunst or Ms. Sara Rove. Otherwise, surveys and direct observation will not impact your child's enrollment in the Highlands Micro School Archaeology Summer Camp.

How will your child's privacy and confidentiality be protected if s/he participates in this research study?

Your child's private information, including age, name, and gender, will not be collected or used in my report, allowing them to remain anonymous. They will be assigned the generational label of 'child' through answering the survey set aside for children. Otherwise, no identifying information will be collected during surveys or observations.

The information that you give in the study will be anonymous. Your child's educational records will **not** be accessed or used in any way.

Information collected about your child will not be used or shared for future research studies.

The information that you provide in the study will be handled confidentially. However, there may be circumstances where this information must be released or shared as required by law. Representatives from the University of Denver may also review the research records for monitoring purposes.

Whom to contact with questions about the study?

Prior, during or after your participation you can contact the researcher **Nicholas Dungey** at **(214) 608-1636** or send an email to **nick.dungey@du.edu** for any questions or if you feel that you have been harmed. This study has been reviewed and approved by The University of Denver's Institutional Review Board and the IRBNet number is **1434092**. The Faculty Sponsor overseeing this project is **Dr. Bonnie Clark** and may be reached at **(303) 871-2875** or **Bonnie.Clark@du.edu**.

Whom to contact with questions concerning your rights as a research participant?

For questions about your rights or any dissatisfaction with any part of this study, you can contact, anonymously if you wish, the **University of Denver (DU) Institutional Review Board** by phone at **(303) 871-2121** or email at IRBAdmin@du.edu.

You are making a decision about allowing your child to participate in this study. Your signature below indicates that you have read the information provided above and have decided to allow them to participate in the study. If you later decide that you wish to withdraw your permission for your child to participate in the study you may discontinue his or her participation at any time. You will be given a copy of this document.

Printed Name of Child

Signature of Parent/Guardian

Date

Highlands Micro School Verbal Assent Script for Children

Hi. My name is Nicholas Dungey. I'm a student at the University of Denver. Right now, I'm trying to learn about adults and children learning about archaeology together. I would like to ask you to help me by being in a research study. A research study is a way to learn more about something. You are being asked to join the study because you can provide a unique view as you learn about archaeology.

You do not have to be in this study. It is up to you. You can say okay now to be in the study and change your mind later. All you have to do is tell us when you want to stop. No one will be upset if you don't want to be in the study or if you change your mind later.

I will ask you to answer questions about archaeology before we start learning about archaeology and after we start learning about archaeology and make observations as you learn about archaeology with your friends and the adults working with us.

We will want to photograph you during the study as you complete lessons, learn with your friends, and answer questions. If you do not want to be photographed, that is okay too. Just tell us if it makes you uncomfortable.

By being in the study, you will help me understand how learning with adults could be a better way to learn about archaeology. Even if you do not want to help me in my research, and that is okay, you will still be learning about archaeology this week with your friends and the adults. It will be a fun learning experience for all of us!

Your parents, students, and Ms. Rove will not know what you have answered in the questions I ask you. When I tell other people about my study, I will not use your name, and no one will be able to tell who I'm talking about.

Your mom/dad/ guardian says it's okay for you to be in my study. But if you don't want to be in the study, you don't have to be. What you decide won't make any difference in learning about archaeology this week or playing with your friends.

You can ask me questions about the study. If you have a questions later that you don't think of now, you can call me or ask your parents or Ms. Sara to call me or send me an email.

Do you have any questions for me now?

Would you like to be in my study and start learning about archaeology?

Name of Child: _____ Parental Permission on File: Yes
 No

(If "No", do not proceed with assent or research procedures.)

Child's Voluntary Response to Participation: Yes No

Signature of Researcher:

(Optional) Signature of Child:

DISCLAIMER

- On-going research is currently occurring at this exhibit that focuses on adults and children interacting while learning about archaeology. This research is being conducted by the University of Denver and not History Colorado. Interactions between adults and children while they learn about archaeology through the Amache Garden Exhibit will be noted for future research. No personal data will be collected. If you do not want to partake in this study, then please let one of the people working with the exhibit know that you do not want to be a participant. Opting out of the research will not prevent you from enjoying the exhibit.
- There will also be a brief survey using color-coded notecards for those who want to participate in this research further. By completing the survey, participants have acknowledged that this data can be used in research on interactions between adults and children. Verbal consent will be asked beforehand by one of the workers at the exhibit. Again, opting out of the research will not prevent you from enjoying the exhibit as much as possible. Thank you for visiting the Amache Garden Exhibit and we hope you enjoy your experience here!

Appendix B: Surveys and Observation Guide

Highlands Micro School Survey

Summer Camp Survey

You are invited to participate in a research study “From Field to Museum: Applying Intergenerational Teaching in Public Archaeology.” The purpose of this study is to understand how intergenerational teaching can be used to teach adults and children about archaeology.

If you decide to participate, please understand your **participation is voluntary** and you have the **right to withdraw and discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. The alternative is not to participate.** If you decide to participate, complete the following survey. Your completion of this survey indicates your consent to participate in this research study. The survey is designed to understand if there are any changes in attitudes about archaeology after participating in an intergenerational (adult and children) learning setting. It will take about 3 to 5 minutes to complete the survey once, but you will complete the survey twice (both before and after you have completed the activities). You will be asked to answer questions relating to archaeology and what you think it is. Data will be collected using the Internet; no guarantees can be made regarding the interception of data sent via the Internet by any third party. Confidentiality will be maintained to the degree permitted by the technology used.

Your decision whether or not to participate will not affect your future relationships with Highlands Micro School/History Colorado Center. If you decide to participate, you are free to stop at any time; you may also skip questions if you don't want to answer them or you may choose not to return the survey.

Please feel free to ask questions regarding this study. You may contact me, **Nicholas Dungey with the University of Denver Department of Anthropology**, if you have additional questions at nick.dungey@du.edu or (214) 608-1636. Or contact **Dr. Bonnie Clark, Associate Professor of Anthropology at the University of Denver** at Bonnie.Clark@du.edu or (303) 871-2875.

If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the University of Denver (DU) Institutional Review Board to speak to someone independent of the research team at (303) 871-2121, or email at IRBAdmin@du.edu.

For each statement or question, select which answer is most accurate to you.

Q1

Are you an adult or a child (under 18 years old)?

- Adult
- Child

Q2

Do you have experience with archaeology?

- Yes
- No
- Not sure

Q3

How interested are you in archaeology?

- Very interested
- Interested
- Neutral
- Uninterested
- Very uninterested

Q4

How important is archaeology to you?

- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

Q5

How important is archaeology to your community?

- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

Q6

How important is archaeology to understanding humanity?

- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

Q7

Archaeology should be included more in school lesson plans.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

Q8

There should be more chances to learn about archaeology outside of school.

- Strongly agree

- Agree
- Neutral
- Disagree
- Strongly disagree

Q9

Learning about archaeology with multiple generations makes it a better experience.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

Q10

Archaeology is fun to learn about.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

Q11

I would be interested in surveying a site for archaeology.

- Strongly agree
- Agree
- Neutral
- Disagree

Strongly disagree

Q12

I would be interested in participating in an archaeological excavation.

Strongly agree

Agree

Neutral

Disagree

Strongly disagree

Q13

I would be interested in examining artifacts in a lab.

Strongly agree

Agree

Neutral

Disagree

Strongly disagree

Q14

I would be interested in learning about archaeology at a museum.

Strongly agree

Agree

Neutral

Disagree

Strongly disagree

Q15

What five words would you use to describe archaeology?

- Dirt
- Digging
- Fun
- Educational
- Dinosaurs
- Bones
- Needed
- Unneeded
- Cultures
- People
- Artifacts
- Exploring
- Treasure
- Ruins
- Caves

The History Colorado Center Survey

Museum Survey

You are invited to participate in a research study “From Field to Museum: Applying Intergenerational Teaching in Public Archaeology.” The purpose of this study is to understand how intergenerational teaching can be used to teach adults and children about archaeology.

If you decide to participate, please understand your **participation is voluntary** and you have the **right to withdraw and discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. The alternative is not to participate.** If you decide to participate, complete the following survey. Your completion of this survey indicates your consent to participate in this research study. The survey is designed to understand if there are any changes in attitudes about archaeology after participating in an intergenerational (adult and children) learning setting. It will take about 2 to 3 minutes to complete the survey. You will be asked to answer questions relating to archaeology and what you think it is. Data will be collected using this survey and no personal information will be used.

Your decision whether or not to participate will not affect your future relationships with History Colorado Center. If you decide to participate, you are free to stop at any time; you may also skip questions if you don't want to answer them or you may choose not to return the survey.

Please feel free to ask questions regarding this study. You may contact me, **Nicholas Dungey with the University of Denver Department of Anthropology**, if you have additional questions at nick.dungey@du.edu or (214) 608-1636. Or contact **Dr. Bonnie Clark, Associate Professor of Anthropology at the University of Denver** at Bonnie.Clark@du.edu or (303) 871-2875.

If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the University of Denver (DU) Institutional Review Board to speak to someone independent of the research team at (303) 871-2121, or email at IRBAdmin@du.edu.

For each statement or question, select which answer is most accurate to you.

Are you an adult or a child (under 18 years old)?

Adult

Child

What five words would you use to describe archaeology?

- Dirt
- Digging
- Fun
- Educational
- Dinosaurs
- Bones
- Needed
- Unneeded
- Cultures
- People
- Artifacts
- Exploring
- Treasure
- Ruins
- Caves

Observation Guide

Under each question, describe the observations made of participants as they are learning about archaeology with quick notes:

What are participants doing? Write-in stations on left-most column and note how many adults and children are participating at each station.

	Adults	Children

Notes:

Who are they doing it with? Note how many adults you see interacting with adults, children interacting with children and adults interacting with children.

	Adults	Children
Adults		
Children		

Notes:

What specific instances of intergenerational communication and learning is occurring?

What specific instances of engagement with learning is occurring?

Are there instances of adults engaging children with what they are learning or vice versa? If so, what?

Appendix C: Highlands Micro School Site Associated Documents and Lesson Plans

Week 1 Summer Camp

Day One Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in their journal word banks

What students will be doing	What they will learn from it
People coming and welcome	
Signing assent and consent forms and taking the pre-survey with the help of Brian and Sara	
Brief introduction lesson on what we will be doing this week and gridding, and hand out journals	<ul style="list-style-type: none"> - The lesson on survey will touch on teaching participants/students about mapping, gridding, context, and GPR - Will provide a summary of the week: <ul style="list-style-type: none"> - <i>Ground penetrating radar (GPR)</i> with Miss Brianna: she will give a brief lesson on GPR in archaeology and will do a live demonstration of GPR with Highlands Micro School; will have the images ready by the end of the week - <i>Gridding</i> sites: this is how an archaeologist maps a site and starts to record it; it's like putting a map into little quadrants - <i>Surveying</i>: we will survey the grid we lay out outside to understand how archaeologists go about doing walking surveys for artifacts - <i>Context</i>: when archaeologists compare artifacts to other artifacts already found and the site they have found them at - <i>Interpretation</i>: the way that archaeologists view objects and sites to fill in the blanks that they cannot know about without interpreting - The journal and word bank will be handed out beforehand so that some participants may write down the words that

	<ul style="list-style-type: none"> - Refer to using grids and what <i>gridding</i> is in archaeology - Talk very briefly about what a <i>site datum</i> is and how archaeologists use it to set up a grid for measurements
Snack	
Gridding outside	<ul style="list-style-type: none"> - Have kids work together and do the gridding after explaining what it is. Of course, help them and create a measurement for what we are doing (say each square on the grid is 1 meter by 1 meter: can use string for this, but don't want people to trip, so may not have it taut) - Before we do the gridding, we will also have them set up a datum themselves where we can measure from - Will need tape measures of course, then we can put artifacts in the grids for the next day and have them find them and write them down on a map (will help in teaching math and measurements through archaeology)
Lunch and prepare for afternoon lesson; journal writing	
Tinker Time	<ul style="list-style-type: none"> - This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology - Tinker time outside of archaeology can be discussed with Sara - This will be using the Gridding a Site worksheet with participants to expand upon what they learned during the day - Provide a brief introduction of the lesson to the children - Explain this is how archaeologists use grids when talking about artifacts - Work with them on this to help facilitate an understanding of what grids are used for in archaeology and to also help with math/measurements

	<ul style="list-style-type: none"> - This worksheet can be used to prepare students for the next day when we survey outside - Other activities for children who do not want to learn about archaeology the rest of the day - Otherwise this can be seen as a play time or interaction time
Start ending the day	- This can be a chance for participants to just start unwinding from the day, whether that be journal writing, asking us questions, or playing with other participants
End of the day; people start leaving and children start getting picked up by parents or guardians	

Day Two Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in their journal word banks

What students will be doing	What they will learn from it
People coming and welcome	
Recap on gridding and what we did the day before	- Slowly bring back participants and the students to the day and shifting their gears to archaeology
Asking about their journals	- Talk with them about their journals and how they are coming along, take questions and volunteers on what they have been writing in their journals to see how this lesson is coming along and how students are viewing archaeology; this will be a chance to help children who are having trouble with writing what they did in a journal. It doesn't have to be much, but can even be pictures of what they did or words, it depends on the participant
Brief introduction lesson on <i>surveying</i> and what we will be doing today	- How archaeologists use surveying to find artifacts before they conduct excavation; sometimes at certain locations that is all they do. It is like an egg hunt and used to find <i>artifacts</i> .

	<ul style="list-style-type: none"> - Refer back to the grid we made yesterday and use a gridding sheet to measure and mark artifacts that are found in the grid (artifacts being everyday objects and pot sherds from Sara)
Snack	
Surveying and using the grid outside	<ul style="list-style-type: none"> - Have participants work together in groups, with some drawing the objects on a piece of paper and others finding the objects in the grid, help them as needed (this can help with transferring measurements to paper [say each square on the printed out grid is approximately 3cm=1m or so]); this is a chance to continue with using archaeology to teach participants about math in archaeology and mapping - <i>Grid mapping</i> is when we map the artifacts or interesting features/sites we find in the grid (for example the hole they dug can be in the grid and considered a <i>feature</i>). Have people writing stuff in the journals at the same time (when possible and not in a way that overworks them) - Will need tapes measures, handout, pencils, and journals
Lunch and prepare for Tinker Time; journal writing	
Tinker Time	<ul style="list-style-type: none"> - This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology - Tinker time outside of archaeology can be discussed with Sara - Brian and I can handle the archaeology portion, which this day will be drawing <i>stratigraphy</i> and <i>plan maps</i>. How this is used in archaeology and drawing maps in archaeology. Plan maps can include measuring and drawing the schoolhouse on a map and other features that are present in the playground. - Meanwhile, Sara, depending on her husband, can have a <i>photogrammetry</i>

	<p>lesson for those who don't want to continue learning about archaeology</p> <ul style="list-style-type: none"> - Otherwise this can be seen as a play time
Start ending the day	<ul style="list-style-type: none"> - This can be a chance for participants to just start unwinding from the day, whether that be journal writing, asking us questions, or playing with other participants
End of the day; people start leaving and children start getting picked up by parents or guardians	

Day Three Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in their journal word banks

What Students Will be Doing	What they Will Learn from it
People coming and welcome	
Recap on survey and what we did the day before	<ul style="list-style-type: none"> - Slowly bring back participants and the students to the day and shifting their gears to archaeology
Asking about their journals	<ul style="list-style-type: none"> - Talk with them about their journals and how they are coming along, take questions and volunteers on what they have been writing in their journals to see how this lesson is coming along and how students are viewing archaeology; this will be a chance to help children who are having trouble with writing what they did in a journal. It doesn't have to be much, but can even be pictures of what they did or words, it depends on the participant
Introductory lesson on what GPR is by Bri	<ul style="list-style-type: none"> - This lesson will teach students about ground penetrating radar in archaeology before we do the live demonstration
Snack	
Live demonstration of GPR	<ul style="list-style-type: none"> - Do the live demonstration of GPR using the school's backyard; ask Bri about the participants being able to handle the GPR so that they can participate; this will teach children about geophysics and using GPR

	to do archaeological survey without any excavation
Lunch, prepare for afternoon lesson; journal writing (can use this as a time to encourage students to write in their journals)	
Tinker Time	<ul style="list-style-type: none"> - This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology - Tinker time outside of archaeology can be discussed with Sara - Use the Highlands Micro School Archaeology in the Future Worksheet to help children understand what <i>archaeology</i> is; provide a brief explanation of archaeology (the study of humans in the past) and <i>anthropology</i> (the study of humans); let people work on the worksheet and work with them; this will provide students and participants the opportunity to describe what archaeology is to them - This can also be a time to take questions on archaeology around the world and provide a lesson to participants who want to continue learning about archaeology on other archaeological sites - Otherwise this can be seen as a play time or interaction time
Start ending the day	- This can be a chance for participants to just start unwinding from the day, whether that be journal writing, asking us questions, or playing with other participants
End of the day; people start leaving and children start getting picked up by parents or guardians	

Day Four Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in their journal word banks

What students will be doing	What they will learn from it
People coming in and welcome	
Recap on GPR and what we did the day before	<ul style="list-style-type: none"> - Slowly bring back participants and students to the day and shifting their gears to archaeology - Let them know how Bri is doing with the GPR data
Asking about their journals	<ul style="list-style-type: none"> - Talk with them about their journals and how they are coming along, take questions and volunteers on what they have been writing in their journals to see how this lesson is coming along and how students are viewing archaeology; this will be a chance to help children who are having trouble with writing what they did in a journal. It doesn't have to be much, but can even be pictures of what they did or words, it depends on the participant
Brief introduction lesson on <i>context</i> and what we will be doing today	<ul style="list-style-type: none"> - This will be using the objects we found in the grid from when we did gridding and surveying; this will be a chance for participants to understand what context is in archaeology and how it can connect to stuff in their lives - Ask them if they have a toothbrush or something that everyone has. Then, connect it to the idea that if you see this toothbrush in someone's house, then you know what they use it for because you have your own or you have seen it being used. This is the same with artifacts. Archaeologists can use context to help them understand what is found at a site by comparing to artifacts from other sites and where it was found
Snack	
Photogrammetry and Context	<ul style="list-style-type: none"> - If able, do an exercise on photogrammetry to help students understand what to look for when analyzing an object – this will lead into context - Brief lesson on objects' context in archaeology

Activity with the artifacts found during gridding and survey	<ul style="list-style-type: none"> - This will make applying context in archaeology a more applicable lesson for participants and makes it more personable - Can ask questions such as where they have found something like this in their house or have they seen an object like this in a museum? Creating connections for the participants to see how context works.
Lunch and prepare for Tinker Time; journal writing	
Tinker Time	<ul style="list-style-type: none"> - This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology - Tinker time outside of archaeology can be discussed with Sara - Brian and I will focus on the archaeology portion. - Talk to Sara about activities students and participants can do outside of archaeology - Otherwise this can be seen as a play time and interaction for students and participants
Start ending the day	<ul style="list-style-type: none"> - This can be a chance for participants to just start unwinding from the day, whether that be journal writing, asking us questions, or playing with other participants
End of the day; people start leaving and children start getting picked up by parents or guardians	

Day Five Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in their journal word banks

What students will be doing	What they will learn from it
People coming in and welcome	
Recap on context and what we did the day before	<ul style="list-style-type: none"> - Slowly bring back participants and students to the day and shifting their gears to archaeology

Asking about their journals	<ul style="list-style-type: none"> - Talk with participants about their journals and how they are coming along, take questions and volunteers on what they have been writing in their journals to see how this lesson is coming along and how students are viewing archaeology; this will be a chance to help children who are having trouble with writing what they did in a journal. It doesn't have to be much, but can even be pictures of what they did or words, it depends on the participant; let them know these journals will be collected at the end of the day and returned to them within a week
Brief introduction lesson on <i>archaeological interpretation</i> and what we will be doing today	<ul style="list-style-type: none"> - We will be using a temporary exhibit I developed for History Colorado Center to teach participants about interpretation in archaeology and how we use it to understand sites we have excavated. This will require Amache Entryway Garden Archaeology handouts and the exhibit, which I will bring for students to work with.
Snack	
Explain what was found in the analyzed GPR data	<ul style="list-style-type: none"> - This will be a chance for participants and students to see what else may be in the ground at Highlands Micro School - A chance to spark interest in further archaeology-themed lessons; also, for them to learn more about GPR and how it is used in archaeology
Amache Entryway Garden Archaeology activity	<ul style="list-style-type: none"> - This can be done inside - I will bring the temporary exhibit that I have been working on with History Colorado and Bonnie to show participants and students how to work with archaeological sites and recreate them on a map using archaeological interpretation - Archaeological interpretation is a phrase that basically means we use the data we have gathered from a site to interpret what the site could have looked like when it was occupied

	<ul style="list-style-type: none"> - This will use a worksheet that will also be brought by me and some measuring tools - This exercise can be used to teach children about interpretation and pragmatic imagination in archaeology
Lunch and prepare for Tinker Time; journal writing	
Tinker Time	<ul style="list-style-type: none"> - This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology - Tinker time outside of archaeology can be discussed with Sara - Brian, Bri, and I will focus on the archaeology portion. This day we will talk more about GPR and how archaeologists use it to understand a site. This can be done through a presentation with Bri and how it is used at other sites around the world. It will also go more into how GPR was used at Highlands Micro School and the results from the GPR survey - If Sara's husband can come back with the results of photogrammetry, then that could also be a lesson used to teach kids about other technological techniques used by archaeologists to examine a site - Other ideas for this time? - Otherwise this can be seen as a play time and interaction for students and participants
Journal collection and post-survey	<ul style="list-style-type: none"> - Journals will be collected from participants and students to make copies and then returned to them roughly a week later - Post-surveys (like the pre-surveys) will be handed out and answered by participants with the help of Brian and Sara
Start ending the day	<ul style="list-style-type: none"> - This can be a chance for participants to just start unwinding from the day, whether that be journal writing, asking us

	questions, or playing with other participants or students
2:45-3:00: End of the day and Week 1; people start leaving and children start getting picked up by parents or guardians; will also be a chance to say goodbye before everyone leaves for the week	

Week 1 Archaeology Word Bank

New Words	Definitions
Anthropology	The study of people
Archaeology	The study of people in the past
Artifact	An object that archaeologist's study to learn about the past
Feature	What's left of a past building on the surface or underground for archaeologists to study
Surveying	Archaeologists before excavation to map out a site
Gridding	Placing measured squares on the ground to make it easier for archaeologists to collect artifacts
Photogrammetry	Making measurements using photographs
Ground Penetrating Radar (GPR)	Archaeologists use these machines to see underground

Archaeology in the Future Worksheet (Developed by Ms. Sara Rove, Highlands Micro School, 2019)

Instructions:

Work from the present (the surface) to the past (the bottom). Draw the artifacts that you think archaeologists 300 years from now will find if they are excavating the site where Highlands Micro School was! Think about the objects in the playground and what would be a good artifact in the future!

Surface (Highlands Micro School Site, AD 2319)

100 Years Old (AD 2219)
200 Years Old (AD 2119)
300 Years Old (AD 2019)

Week 2 Summer Camp

Day Six Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in the word bank handout

What students will be doing	What they will learn from it
9:00-9:15: People coming and welcome	
9:15-9:50: Signing assent and consent forms and taking the pre-survey with the help of Brian and Sara	
9:50-10:15 Brief introduction lesson on what we will be doing this week and today, and hand out journals with word banks	<ul style="list-style-type: none">- The lesson on tools and safety rules revolving around archaeological excavation and showcasing the tools we will be using this week- Will provide a summary of the week:- <i>Tools</i> and <i>safety</i>: a brief overview of the tools and safety that goes into archaeology; this will include the needed tools and the safety procedures participants and students are expected to follow- <i>Excavation (maintenance)</i>: will explain briefly what this will cover, including what maintenance on the site will look like and what is expected to be found. This will occur over two days.- <i>Field analysis</i>: this is what archaeologists do in the field to examine artifacts and create judgements based off previous work and the material that is found on-site, this will occur over two days as well.- The journal and word bank will be handed out beforehand so that some participants may write down the words that- Inform that after snack we will be introducing the tools that will be used during the week
10:15-10:30: Snack	
10:30-11:15: Go over tools we will be using	<ul style="list-style-type: none">- This will be an overview of the tools that will be used during the week and let the participants and students handle the tools briefly.- Tools that will be used include:

	<ul style="list-style-type: none"> - <i>Trowels</i> for excavating the site - Brushes and dust pans to carefully clean artifacts and the site - <i>Sifting screens (sieve)</i> that are used to sift through the dirt that is collected from the unit to find smaller artifacts (will explain the measurement when known) - Shovels - Datum which is used as a central point to make measurements from - Tape measures - Plum bobs, which are used to make straight measurements from elevated positions - String which will be used to square off the hole and make it a formal unit - Gloves and safety goggles as safety equipment that will be used at all times
11:15-12:00: What will be done with site	<ul style="list-style-type: none"> - Explain that the site will be squared out and maintained, meaning that little excavation will be done, but it will be extended to a 1x1 meter pit - Introduce the recording sheets that will be used when doing the maintenance and excavation and what the roles will be for everyone - There will be excavation/maintenance, sieving/sifting, and cleaning off/recording artifacts - Site recording sheets will be done by participants working in the excavation/maintenance portion, and show/do an example of a site recording sheet - Objects will be recorded as well as they are being cleaned off, these will be preliminary collection reports and examples will be shown again
12:00-1:00: Lunch and prepare for tinker time in the afternoon; journal writing	
1:00-2:30: Tinker Time	<ul style="list-style-type: none"> - This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology

	<ul style="list-style-type: none"> - Tinker time outside of archaeology can be discussed with Sara - For archaeology we can use examples of site and object recording sheets (talk to Bonnie about getting copies used at Amache) using the excavated pit for students to understand how to record sites and objects previously collected by students - If time allows, this can also be when Brian and I talk about the history of the school and what this trash pit could represent such as time period, why all of this trash was here, and what was here previously before Highlands Micro School; can show how, in history, this school is just a small piece of it and there was more here before the school. Basically, a history of the community (bring and show the artifacts from the site; just keep artifacts here over the camp) - Other activities for children who do not want to learn about archaeology the rest of the day - Otherwise this can be seen as a play time or interaction time
2:30-2:45: Start ending the day	<ul style="list-style-type: none"> - This can be a chance for participants to just start unwinding from the day, whether that be journal writing, asking us questions, or playing with other participants
2:45-3:00: End of the day; people start leaving and children start getting picked up by parents or guardians	

Day Seven and Eight Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in the word bank handout

What students will be doing	What they will learn from it
9:00-9:15: People coming and welcome	

9:15-9:30: Recap on tools and safety and what we did the day before	- Slowly bring back participants and students to the day and shifting their gears to archaeology
9:30-10:00: Asking about their journals	- Talk with participants about their journals and how they are coming along, take questions and volunteers on what they have been writing in their journals to see how this lesson is coming along and how students are viewing archaeology; this will be a chance to help children who are having trouble with writing what they did in a journal. It doesn't have to be much, but can even be pictures of what they did or words, it depends on the participant
10:00-10:15: Brief introduction lesson on the archaeology of the school (Day 7) or a brief recap of what we found the day before (Day 8) and what we will be doing today	<p>- (Day 7) We will be talking about the unit and what we will be doing today with it. I will explain that there will be three stations, like I did yesterday, to reiterate what we are doing. After that I am going to make sure everyone knows what the tools are used for and assign groups to start at each station. Each station will be headed by Brian, Sara, or I so that we are able to teach students and participants as they interact with the archaeology of the school</p> <p>- (Day 8) We will be recapping what we found yesterday and go over what was learned; after that we will talk briefly about where people left off in each station and then have snack before continuing with the excavation portion of the day</p>
10:15-10:30: Snack	
10:30-12:00: Excavation and maintenance	<p>- Students and participants will be going through different stations to learn about archaeology (each group will spend 30 minutes at each station):</p> <p>- Excavation/maintenance: this is where students and participants will be working with the archaeological site and using tools to turn the unit into a formal unit; they will collect any loose artifacts and give them to the group to clean off and record artifacts; they will also collect dirt in buckets to give to the sieving/sifting team. They will</p>

	<p>record paperwork of the unit (which should only be one sheet per group) – this will occur for each group so they can better understand recording sites</p> <ul style="list-style-type: none"> - Sieving/sifting: the dirt collected by the excavation/maintenance team will be given to this team so that they can search for smaller artifacts and collect them; there will be specific bags they need to put them in, much like the bags the excavation/maintenance team will be using - Cleaning off/recording: the artifacts collected from the two other teams will arrive here to be cleaned up and preliminary recording of the artifacts found. While they wait for the first round of artifacts to come, they can examine the artifacts already gathered by students at the school; they will have object reports to write (and this will also be done by Brian and Nick after the camp has concluded)
12:00-1:00: Lunch and prepare for tinker time in the afternoon; journal writing	- Specifically encourage journal writing here for all students and participants
1:00-2:30: Tinker Time	<ul style="list-style-type: none"> - This tinker time will be done by Sara - At this point it may be too hot for students and participants to do anymore excavation, so they will most likely have a tinker time inside - During this time, Brian and I will be working on recording the site ourselves and looking over the paperwork done by the students and participants to make sure the site is properly recorded. - Please let me know what you think of this, Sara, I know we have discussed this before, but wanted to confirm it
2:30-2:45: Start ending the day	
2:45-3:00: End of the day; people start leaving and children start getting picked up by parents or guardians	- With Sara's permission, Brian and I may stay at the school a little bit longer to do a little more paperwork on the unit

Day Nine Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in the word bank handout

What students will be doing	What they will learn from it
9:00-9:15: People coming and welcome	
9:15-9:30: Recap on excavation and what we did over the past two days	- Slowly bring back participants and students to the day and shifting their gears to archaeology
9:30-10:00: Asking about their journals	- Talk with participants about their journals and how they are coming along, take questions and volunteers on what they have been writing in their journals to see how this lesson is coming along and how students are viewing archaeology; this will be a chance to help children who are having trouble with writing what they did in a journal. It doesn't have to be much, but can even be pictures of what they did or words, it depends on the participant
10:00-10:15: Brief introduction lesson on site recording and what we will be doing today	- We will be talking about what <i>stratigraphy</i> is and how and why archaeologists record the stratigraphy of a site. We will also be using this opportunity to take pictures of the site and important objects that have been found. We will continue going over site and object reports as well and what an archaeological report is
10:15-10:30: Snack	
10:30-11:15: Stratigraphy and photography	- We will divide the groups into two so that we can go over site stratigraphy, stratigraphy reporting, and stratigraphy drawing. This will be a lesson on stratigraphy to show children how stratigraphy can be used to understand the unit in layers and how these layers can tell archaeologists what time period a site, object, or feature may be from. Will use the unit as an example, since at this point the walls should be cleared enough to see the stratigraphy. Students can draw stratigraphy on graph paper. - The other group will be working on object and site photography, using <i>photo logs</i> to list what aspects of the sites have

	<p>been photographed. Explain how photographs are used to record a site as best as possible because archaeology is inherently destructive in nature. As we collect the artifacts and excavate the site, we slowly destroy it and remove artifacts from <i>provenience</i>, which means that we take the artifact from where it belonged. By photographing, recording the sites, features, and objects on paper, mapping, and recording stratigraphy, archaeologists can preserve the site as best as they can for future research use. This helps in teaching students and participants about the importance of the past, proper archaeology, history, and archaeological stewardship</p>
11:15-12:00: Switch stations	<ul style="list-style-type: none"> - Change stations: the stratigraphy group goes to the photograph station and the photograph group goes to the stratigraphy station
12:00-1:00: Lunch and prepare for tinker time in the afternoon; journal writing	
1:00-2:30: Tinker Time	<ul style="list-style-type: none"> - This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology - Tinker time outside of archaeology can be discussed with Sara - This tinker time will focus on reporting archaeological sites and expanding upon stratigraphy, field reports, and photography. Brian and I, depending on time, may extend mapping to the next day or stay after the camp to map continue mapping the site - Other ideas for this time? - Otherwise this can be seen as a play time and interaction for students and participants
2:30-2:45: Start ending the day	<ul style="list-style-type: none"> - This can be a chance for participants to just start unwinding from the day, whether that be journal writing, asking us

	questions, or playing with other participants or students
2:45-3:00: End of the day; people start leaving and children start getting picked up by parents or guardians	

Day Ten Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in the word bank handout

What students will be doing	What they will learn from it
9:00-9:15: People coming and welcome	
9:15-9:30: Recap on stratigraphy and photography in archaeology	- Slowly bring back participants and students to the day and shifting their gears to archaeology
9:30-10:00: Asking about their journals	- Talk with participants about their journals and how they are coming along, take questions and volunteers on what they have been writing in their journals to see how this lesson is coming along and how students are viewing archaeology; this will be a chance to help children who are having trouble with writing what they did in a journal. It doesn't have to be much, but can even be pictures of what they did or words, it depends on the participant; let them know these journals will be collected at the end of the day and returned to them within a week
10:00-10:15: Brief introduction lesson on object recording and what we will be doing today	- We will be learning about doing preliminary recording and photographing of the artifacts that have been found at Highlands Micro School. This will teach students and participants about doing proper preliminary recording of objects before they are sent to a lab to be examined and stored.
10:15-10:30: Snack	
10:30-12:00: Object recording and photography	- We will divide the groups into three different teams. Under our supervision, students and participants will engage with the artifacts that have been collected at the

	<p>site. They will do brief reports about the objects and start making interpretations about the object they have. This will also be the time for them to photograph the object and we can show them how objects are usually photographed in archaeology. This exercise will require a photo ruler (which I can bring) and object report handouts (which I can also bring). This will be a chance to teach children about preserving and storing archaeological materials through the beginning process of it.</p>
12:00-1:00: Lunch and prepare for tinker time in the afternoon; journal writing	
1:00-2:00: Tinker Time	<ul style="list-style-type: none"> - This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology - Tinker time outside of archaeology can be discussed with Sara - Brian and I will work with the students and participants on drawing the artifacts and taking photographs of them (for those who want to keep doing archaeology). Again, it will be chance to teach the students and participants about recording archaeology after we are done in the field, fostering a sense of stewardship of artifacts at the school.
2:00-2:30: Journal collection and post-survey	<ul style="list-style-type: none"> - Journals will be collected from participants and students to make copies and then returned to them roughly a week later - Post-surveys (like the pre-surveys) will be handed out and answered by participants with the help of Brian and Sara
2:30-2:45: Start ending the day	<ul style="list-style-type: none"> - This can be a chance for participants to just start unwinding from the day, whether that be journal writing, asking us questions, or playing with other participants or students

<p>2:45-3:00: End of the day and Week 2; people start leaving and children start getting picked up by parents or guardians; will also be a chance to say goodbye before everyone leaves for the week</p>	
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Week 2 Archaeology Word Bank

New Words	Definitions
Anthropology	The study of people
Archaeology	The study of people in the past
Artifact	An object that archaeologist's study to learn about the past
Feature	What's left of a past building on the surface or underground for archaeologists to study
Excavation	When archaeologists carefully uncover a site and artifacts using tools
Excavation Tools	Tools used during excavation, such as trowels or sifting screens
Excavation Safety	Being careful around yourself, people, and the site when using tools and wearing protective equipment like gloves
Datum	A point where archaeologists make their measurements from
Stratigraphy	Layers of dirt or soil that archaeologists use for dating and measuring
Provenience	The location of an artifact or feature

What Is Archaeology? Worksheet (Smith et al. 1996)

<p>① Define the word archaeology.</p>	<p>② Draw a picture of an archaeologist and what kinds of tools he or she might use; or describe an archaeologist.</p>
<p>③ Draw a picture of an archaeological site or describe it.</p>	<p>④ List the steps an archaeologist might take when he or she studies an archaeological site.</p>

Week 3 Summer Camp

Day Eleven Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in the word bank handout

What students will be doing	What they will learn from it
9:00-9:15: People coming and welcome	
9:15-9:50: Signing assent and consent forms and taking the pre-survey with the help of Brian and Sara	
9:50-10:15: Brief introduction lesson on what we will be doing this week and today, and hand out journals with word banks	<ul style="list-style-type: none">- The lesson on tools and safety rules revolving around archaeological lab work and showcasing some of the tools we will be using this week- Will provide a summary of the week:<ul style="list-style-type: none">- <i>Scientific instruments</i> and <i>safety</i>: a brief overview of scientific instruments and safety that goes into lab work in archaeology; this will include the instruments used and the safety/handling procedures that participants and students are expected to follow- Recording: will explain what this will cover, including photography, documenting objects, and drawing objects and talk about the artifacts we will be examining. This will occur over two days- Research: this will be used to explain how archaeologists go about researching the objects they found and connecting them to other sites; I will be providing short information that is easy to digest on sites that have found similar artifacts to the ones found at Highlands Micro School.- Presentation: archaeologists present their research and data to their peers to show what they have been working on. This day will be used to present information the students and participants have learned about the objects and techniques they have used in the lab; this will give them a

	<p>grasp of both the scientific method and an understanding of presentation skills</p> <ul style="list-style-type: none"> - The journal and word bank will be handed out beforehand so that some participants may write down the words that - Inform that after snack we will be introducing the instruments that will be used during the week
10:15-10:30: Snack	
<p>10:30-12:00: The scientific instruments we will be using, demonstration period, and what labs look like in archaeology; pass around the artifacts found too for students and participants to get a firsthand experience with them – use these to showcase safety rules about lab work too</p>	<ul style="list-style-type: none"> - This will be an overview of the instruments that will be used during the week and let the participants and students handle the instruments briefly. - Instruments that will be used include: <ul style="list-style-type: none"> - <i>Microscopes</i>: this will be a microscope we can plug into a computer to use or microscopes that are usually in the lab; they can help examine an object and how it looks at a microscopic level - <i>Calipers</i>: like tape measures, these are used to measure objects - Tape measures - <i>Artifact bags</i>: these are bags specifically used for holding an artifact; <i>artifact numbers</i> will be given to them as they are placed in the bags - <i>Object Record Sheets</i>: these will be used to record measurements and what you found about the object, but these measurements and details, such as what it is, shape, and color will go into journals first - After that, we will bring out the artifacts for students and participants to look at so they can see what they will be working with later in the week; this will be chance for them to interact with the objects carefully and learn about <i>object handling</i> as they do so and how to handle these objects throughout the week - Give students and participants the opportunity to interact with the instruments and artifacts carefully and mindfully and answer any questions they

	may have about the things they are interacting with
12:00-1:00: Lunch and prepare for tinker time in the afternoon; journal writing	
1:00-2:30: Tinker Time	<ul style="list-style-type: none"> - This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology - Tinker time outside of archaeology can be discussed with Sara - For archaeology, Brian and I will take two groups to work on measuring the ceramic objects from Highlands Micro School and learn about measuring artifacts during lab. This will be hands-on activity using the artifacts and will give students and participants an idea of what we will be looking for as we do lab work; the other group will continue working with the artifacts or instruments if they want to learn more about them. We can also have students and participants switch between activities to keep them interested in different aspects - Other activities for children who do not want to learn about archaeology the rest of the day - Otherwise this can be seen as a play time or interaction time
2:30-2:45: Start ending the day	
2:45-3:00: End of the day; people start leaving and children start getting picked up by parents or guardians	

Day Twelve Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in the word bank handout

What students will be doing	What they will learn from it
9:00-9:15: People coming and welcome	

9:15-9:30: Recap on instruments and safety and what we did the day before	- Slowly bring back participants and students to the day and shifting their gears to archaeology
9:30-10:00: Asking about their journals	- Talk with participants about their journals and how they are coming along, take questions and volunteers on what they have been writing in their journals to see how this lesson is coming along and how students are viewing archaeology; this will be a chance to help children who are having trouble with writing what they did in a journal. It doesn't have to be much, but can even be pictures of what they did or words, it depends on the participant
10:00-10:15: Brief introduction lesson on recording objects in an archaeology lab	- Recording objects in an archaeology lab setting can include photographing, measuring, examining smaller objects under a microscope, drawing the object, and writing details about the object in your journal; for those of the students that went to DU over break, this is similar to the exercise we did with your artifacts near the end of the day
10:15-10:30: Snack	
10:30-12:00: Recording requires the use of scientific instruments that we went over yesterday and drawing/writing notes in your journals before putting them in any sort of database	<p>- Students and participants will be choosing objects either from those we have collected through the summer camp or those we have collected before the summer camp. They will be working in research groups to examine these artifacts and:</p> <ol style="list-style-type: none"> 1. Take measurements 2. Record details 3. Interact with the artifacts 4. Make guesses where and when they came from 5. Draw artifacts 6. Compare artifacts <p>- This information will be recorded in their journals and they will interact with other students and participants (and with us) to share what they have found out about the artifacts and the site</p>

12:00-1:00: Lunch and prepare for tinker time in the afternoon; journal writing	
1:00-2:30 Tinker Time	<ul style="list-style-type: none"> - This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology - Tinker time outside of archaeology can be discussed with Sara - For archaeology, Brian and I will be working on examining the artifacts like the students and participants did. They can join us and continue interacting with the artifacts and examining them with the lab instruments. They will be repeating the writing and recording of these artifacts in their journals as they do so. - Other activities for children who do not want to learn about archaeology the rest of the day - Otherwise this can be seen as a play time or interaction time
2:30-2:45: Start ending the day	
2:45-3:00: End of the day; people start leaving and children start getting picked up by parents or guardians	

Day Thirteen and Fourteen Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in the word bank handout

What students will be doing	What they will learn from it
9:00-9:15: People coming and welcome	
9:15-9:30: Recap on recording and examining the artifacts	- Slowly bring back participants and students to the day and shifting their gears to archaeology
9:30-10:00: Asking about their journals	- Talk with participants about their journals and how they are coming along, take questions and volunteers on what they have been writing in their journals to see how this lesson is coming along and how students are viewing archaeology; this will be a chance to help children who

	<p>are having trouble with writing what they did in a journal. It doesn't have to be much, but can even be pictures of what they did or words, it depends on the participant</p>
<p>10:00-10:15: (Day 13) Brief introduction lesson on doing <i>research</i> and preparing presentations and (Day 14) recap on what we have learned about our objects so far doing research and how presentations are coming along, will also mention Rebecca stopping by</p>	<p>- (Day 13) This will briefly be over what archaeologists research when they are wanting to present their own research to the public and fellow archaeologists. This will usually include such things as <i>background</i> on the site or artifacts and how they went about doing their research, or their <i>methods</i>. Can use my research as an example and explain how archaeologists do the same with artifacts.</p> <p>- Then we can go over briefly what belongs in a presentation for archaeology and what they will be wanting to do for the presentation they will have on Friday (it will most likely just be a quick explanation of the object they have chosen and what it is/where it came from, what year it was made, and so on [I know some of the students and participants have some experience with this already]); it will be a way for students and participants to engage with their object and understand its significance to history and the area around Highlands Micro School, teaching stewardship and an appreciation of history.</p> <p>- (Day 14) This will depend on availability and time, but I may ask Rebecca from the Office of Archaeology and Historical Preservation to come in and talk with the students and participants about archaeology during Tinker Time, for those who want to talk with or learn from a professional archaeologist (she handles research permits from archaeology sites in Colorado, so she would be perfect to talk to students about research in archaeology)</p>
<p>10:15-10:30: Snack</p>	

10:30-11:15: Research of object	- (Day 13 and 14) This will be a chance to promote individual research of the Highlands area and the objects that students and participants are working with. We (Brian, Sara, and I) will work with them while they research material online for their presentations. This will also be a chance for students and participants to engage with the scientific method. Research should be recorded, preferably, in their journals alongside the analysis they did of the object they chose.
11:15-12:00: Preparing presentations	- (Day 13 and Day 14) Students and participants will be creating presentations how they see fit, whether this be by simply showcasing the object they are working with or doing a short PowerPoint presentation, urge them to come up with a way to show the research and analysis they have done about the object (at this time, if students and participants feel like they need to do more research, then allow them to do so, but also gently urge them to start thinking about how they will present their research)
12:00-1:00: Lunch and prepare for tinker time in the afternoon; journal writing	
1:00-2:30: Tinker Time	<ul style="list-style-type: none"> - This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology - Tinker time outside of archaeology can be discussed with Sara - (Day 13) For archaeology, Brian and I will continue working with students and participants who want to continue doing research and presentation preparation. It will be a continuation of what we were doing before lunch - (Day 14) For archaeology, Rebecca will come in and talk about research in archaeology with the students and participants. After that, we will do any last-minute bits of research or presentation

	<p>preparation for students' and participants' presentations the next day.</p> <ul style="list-style-type: none"> - Other activities for children who do not want to learn about archaeology the rest of the day - Otherwise this can be seen as a play time or interaction time
2:30-2:45: Start ending the day	
2:45-3:00: End of the day; people start leaving and children start getting picked up by parents or guardians	

Day Fifteen Summer Camp

Bolded words are the handouts needed

Italicized words are words that can go in the word bank handout

What students will be doing	What they will learn from it
9:00-9:15: People coming and welcome	
9:15-9:30: Recap on research and presentation preparation	- Slowly bring back participants and students to the day and shifting their gears to archaeology
9:30-10:00: Asking about their journals	- Talk with participants about their journals and how they are coming along, take questions and volunteers on what they have been writing in their journals to see how this lesson is coming along and how students are viewing archaeology; this will be a chance to help children who are having trouble with writing what they did in a journal. It doesn't have to be much, but can even be pictures of what they did or words, it depends on the participant; let them know these journals will be collected at the end of the day and returned to them within a week
10:00-10:15: Brief introduction on the presentations we will be doing today and who will be going when	- This will be a brief recap on what we will be doing with our presentations today and who will be going when. Explain how some people at archaeology research presentations take notes on the topic. Check-in with students and participants on how they feel about their research and

	presentations and if they are ready to present
10:15-10:30: Snack	
10:30-12:00: Presentations	- Groups and individuals will present the data they have on their object and how this relates to Highlands Micro School and possible connections to the history of the Highlands and Denver area. Each group or individual will have a presentation time of 15 minutes. We will ask them if they needed to put up a PowerPoint or if they are just presenting what they have learned. Again, prompt students and participants to take notes on what others have researched and are presenting to the class.
12:00-1:00: Lunch and prepare for tinker time in the afternoon; journal writing	
1:00-2:00: Tinker Time	- This tinker time can be used for participants who want to play outside or inside, or who want to continue learning about archaeology, depending on what time permits. - We will be finishing up presentations at this time and any remainder time can be used for asking questions about archaeology to Brian and me, asking questions about research and presentations to other students and participants, and interacting with others. - If time permits, this can be used as a chance for interaction between students and participants and as a time to play outside of archaeology
2:00-2:30: Journal collection and post-survey	- Journals will be collected from participants and students to make copies and then returned to them roughly a week later - Post-surveys (like the pre-surveys) will be handed out and answered by participants with the help of Brian and Sara
2:30-2:45: Start ending the day	- This can be a chance for participants to just start unwinding from the day, whether

	that be journal writing, asking us questions, or playing with other participants or students
2:45-3:00: End of the day and Summer Camp; people start leaving and children start getting picked up by parents or guardians; will also be a chance to say goodbye before everyone leaves for the week	

The Great Garbage Mystery Worksheets (Developed by Ms. Sara Rove, Highlands Micro School, 2019)

Instructions:

- **Get into groups of three**
- **Listen to the teacher's background about the garbage bins**
- **Make inferences and observations with your group about the items found in the garbage bins**

Great Garbage Mystery Worksheet 1

Object	Inferences
Broken Picture Frame	
Empty Bottle of Cough Syrup	
25 Used Tissues	
4 Stained Red Popsicle Sticks	
1 Ripped Up Pillow with Feathers Coming Out	
Half of a Tennis Ball with Fuzz Ripped Off	

Great Garbage Mystery Worksheet 2

Object	Inferences
2 Frozen Dinner Containers	
½ Gallon of Spoiled Milk	
Empty Bottle of Bubble Bath Soap	
Scrap of Cardboard	
Empty Watercolor Paint Container	
6 Sheets of Crumpled Up Newspaper	

Great Garbage Mystery Worksheet 3

Object	Inferences
3 Empty Ice Cream Containers	
12 Popped Balloons Attached to Ribbons	
24 Spiderman Plates	
Crumpled Wrapping Paper	
7 Half-Burned Candles	
2 Broken NERF Darts	
4 Broken Eggshells	
1 Empty Box of Cake Mix	

Excavation Plan Exercise

Highlands Micro School has been nominated to be on the National Register of Historic Places! However, our excavation was not enough to fully secure a place on the Register, they need more archaeological data to support this nomination. To do this, we need an excavation plan.

In groups of three, you will use your combined knowledge of the history, artifacts, surveys, and, most importantly, the archaeology of Highlands Micro School to create an excavation plan. Then, we will discuss these plans together to determine what our excavation plan should be.

<p>What information do you already have?</p>	<p>What would you expect to find? Why?</p>
<p>Where else do we want to excavate and why?</p>	<p>How should we excavate this site? Come up with some ideas for a plan.</p>

Final Journal Questions for Child Participants

1. What was your best strategy for putting the pot back together?
2. What made it difficult to piece pots back together?
3. What made it easier to piece the pots back together?
4. Would you like to be an archaeologist? Why or why not?
5. Did learning with adults anytime during these three weeks change how you learned? Why or why not?

Highlands Micro School Archaeology Summer Camp Brochure

teachers the opportunity to learn about archaeology from archaeologists and participate in excavating their playground. While they didn't excavate any deeper in the hole-beneath-the-playground, they did excavate around it and found artifacts they hadn't found before.

A make-up bottle was uncovered. A piece of pyrite (fool's gold) fell from the hole's wall. And students discovered A LOT of charcoal with their artifacts! They shoveled dirt out of the unit and placed it into a bucket. Parents and students took these buckets of dirt and sifted them. This means they placed dirt on metal mesh and shook it back-and-forth. Dirt fell through small holes, leaving behind small artifacts!

Once excavation was finished, students, parents, and archaeologists examined the artifacts, researching them and trying to figure out why they were in that hole. A lot of the artifacts were broken. These included metal, glass, and ceramic objects. So, what could it have been? Can you take a guess?

After a few months of extended research after the summer camp by archaeologists, it was discovered that the empty lot where Highlands Micro School would be built was actually used by neighbors to dump their trash. 'Trash pits,' as these are called, were commonly made and used by neighbors next to empty lots before organized trash services existed. Neighbors around Highlands Micro School had at least 70 years to use the empty lot

to place their broken belongings in.

These trash pits are valuable to archaeologists, giving them a snapshot of what life may have been like in the past. Archaeologists found that German neighbors likely broke German-made plates. People from the Midwest moved to this area. They also found that gambling may have occurred here!

Highlands Micro School's history may be different from what they expected when they first started excavating, the school community learned so much more about their place of education than they had known. By participating in archaeology like they did, Highlands Micro School and the people who call it their place of education had the chance to connect with its past.

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Wiberg, Ruth Eliot
1976 "Highlands: The Elite Suburb" in *Rediscovering Northwest Denver: Its History, Its People, Its Landmarks*, pp. 51-154. University Press of Colorado, Niwot, Colorado.

For more information about this project, please contact Ms. Sara Rove or Ms. Anne Wintemute at Highlands Micro School!

Text and layout by Nicholas Dungey, University of Denver



A Balanced Rock, Garden of the Gods commemorative plate found by students before the archaeology summer camp

Photo courtesy of the University of Denver



Archaeologists call formal holes like this a 'unit'. Unit SE2N after students, parents, and archaeologists finished excavating

Photo courtesy of the University of Denver



Students conducting archaeological excavation during the second week of camp

Photo courtesy of the University of Denver

The Highlands Micro School Archaeology Summer Camp, 2019

A partnership between:

The University of Denver
and
Highlands Micro School

Where it all Started...

Curiosity makes you think about what else can be out there. An experience with Highlands Micro School shows just how curious a child can be. It all started with a visit to the University of Denver (DU) Department of Anthropology in December 2018. There, Ms. Sara Rove, Ms. Hannah Turner, and 12 eager students brought archaeologists at DU two boxes of artifacts they excavated from underneath the school playground. These artifacts included historic objects like a poker chip, glass bottles, shattered lamp shades, and even a Garden of the Gods plate! To say they took the archaeologists by surprise is an understatement, they were floored and excited to see the work this small class had put into excavating these artifacts from their playground.

At DU the class learned about examining artifacts like the ones they had found and learned about working in an archaeology lab. But they still wanted to learn more. That was when a partnership in engaging students in their school's archaeology began. It wouldn't just include the children anymore, however, as it involved teachers, parents, students, and archaeologists who wanted to learn about the history of Highlands Micro School.

From there, Ms. Sara Rove, Dr. Bonnie Clark, Nicholas Dungey, and Brian Brunst started working together to create what would become the Highlands Micro School Archaeology Summer Camp.

"But what is our history?"

This question seemed to be on the students' minds ever since they had found these artifacts. Besides wanting to find more cool stuff in the dirt, they had a general curiosity towards learning more about their school. They engaged in school projects, a tour at DU, and even an archaeological excavation. Even their parents started to become more and more interested in what would happen with the hole-beneath-the-playground. Everyone wanted to know what the past was like at the micro school over 100 years ago.

It all started with a man named General William Larimer, Jr. In 1858, he and his partner, D.C. Collier, investigated land north of Denver, establishing the Highland townsite. But what's wrong with that name? It should be Highlands, right? It just so happens that the Highland townsite was General Larimer, Jr.'s attempt to start a town north of Denver. However, it never actually happened. Instead, with help from the establishment of the Potter-Highlands District and Highlands Park, the town of Highlands would be founded in 1876, after signing a document called a 'town charter,' legally making Highlands a town (Simmons and Simmons, 1995).

Everyone in Highlands bragged

about their clean air and water, something that Denver didn't have, helping convince people to move to Highlands. After all, if you knew that you could have clean air and water a short distance from Denver, then wouldn't you move there? That's what a lot of people thought, too! Slowly, the town started to fill up and became a city in 1885 (Hunt, n.d.).

People living in Highlands enjoyed artesian water from one of its 130 water wells (Wiberg, 1976) and those who were sick felt better after breathing in the clean air. Meanwhile, they would walk along the town streets, viewing the gardens and trees that had been grown by patient gardeners to make Highlands green. Some people even compared it to a famous place in the Middle East called the Hanging Gardens of Babylon (Wiberg, 1976)! Trams and electricity started to make its way to Highlands in the 1880s, influential Denverites called Highlands their home, and businesses started popping up everywhere in the city.

However, that wouldn't last. The Panic of 1893 hit and hurt the national economy, including Highlands. Because of this event, the city council started to find themselves without the money to keep the city going. So, on July 24, 1896, the city council and residents voted for

Highlands to become a part of Denver, bringing the two cities together. As it was then, Highlands is now a district in Denver rather than its own city (Hunt, n.d.).

Yet this did persuade more people to move to Highlands. Around this time, in 1890, residents started building houses around the future site of Highlands Micro School. The first house built near this site was 3727 Perry Street in 1890, right next door to the school. This means that different families and people have lived in that building for over 100 years! Over time, other houses were built. Houses along Quitman Street, just behind Highlands Micro School, were built between 1896 and 1906. In 1919, Highlands Micro School's other neighbor, 4015 West 37th Avenue was first built. By 1920, many of the houses currently surrounding the school building today were built.

But what about Highlands Micro School?

It was built in 1989. Before then, no other building stood where Highlands Micro School now stands today.

But students, teachers, parents, and archaeologists found artifacts in the school's playground. So, what was there?

Highlands Micro School Archaeology Summer Camp

The Highlands Micro School Archaeology Summer Camp took place in June 2019, allowing students, parents, and



Archaeologist, Nicholas Dungey, teaching students about artifacts they found during excavation

Photo provided by Ms. Sara Rove

Appendix D: Amache Entryway Garden Archaeology Exhibit

Gardens at Amache Handout

Gardens at Amache

Gardens at Amache were grown for different reasons. Some were dry gardens, what Japanese call *karesansui*. Others were food or victory gardens, cultivated to grow food and help the war effort. Many had trees that provided shade. These gardens helped create a ‘place’ for the Japanese American internees when they were forcefully removed from their homes.

Take this Amache entryway garden, which is reminiscent of some *karesansui* from Japan. Big rocks, encircled by plants, represented islands in a sea of gravel. Japanese American internees did their best with what they had to recreate this effect. They moved four pieces of large concrete to just the right spot. Gravel and cobble collected from the nearby Arkansas River created a sea of smaller rocks. Internees infused the garden’s soil with nutrients and pollen data shows plants that were not native to Colorado’s dry plains were successfully grown here.

Archaeologists were able to use what was found in this *karesansui* and the experiences of internees to understand how they cultivated their gardens. More importantly, archaeologists learned how Japanese American internees came together as a community to remember their heritage in a place that was so unlike home.



Photo of Mataji Umeda in his garden at the Amache Internment Camp.

Photo provided to the University of Denver Amache Project by Helen Yagi Sakikawa

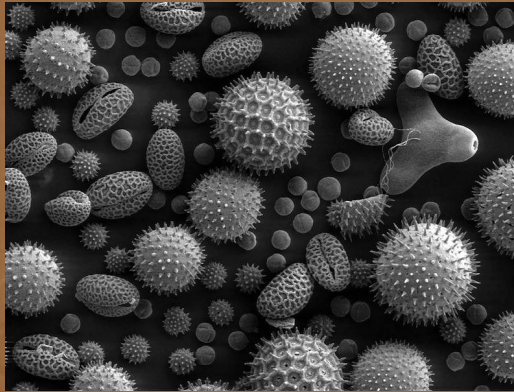


Photo of *karesansui* garden in Japan. Notice any similarities between this and the Amache entryway garden?

Photo from *The Gardens of Japan* by Teiji Ito

Exhibit Worksheet Packet

The Science and Art of Pollen



This is what pollen looks like under a microscope. Look at how many different kinds of pollen there are in this photo!
Photo provided by the Dartmouth College Electron Microscope Facility

When you think of pollen, you probably think of bees or flowers. When archaeologists think of pollen, they think of bees and flowers too, but also other things, like what plants were grown in the past. During excavation, archaeologists know they might find pollen hiding under artifacts, like the pottery piece on the map, or features, like the decorative “stone” pieces.

Unfortunately, pollen is often all that is left of plants for archaeologists to collect at a site like this entryway garden excavated at Amache. Because pollen can’t be seen in the ground, they don’t collect it bit by bit. Instead, archaeologists collect bags of soil which they hope contains pollen grains.

Archaeologists then enlist the help of scientists called ‘palynologists’ to examine pollen grains. Pollen is chemically separated from the soil and then examined under microscopes. Once palynologists know what kind of pollen is mixed in with the soil archaeologists collected, they can tell you what kinds of plants people grew in the past and information about the local environment!

On the back of this sheet, you can find examples of some of the pollen that was found in this garden. Archaeologists know what these plants are because the pollen left behind is distinctive of the plants that produced it. In archaeology, even the most microscopic thing can help interpret a site archaeologists excavated! But we still need to use our imaginations to recreate past environments.



A photo of rosaceae (rose family) pollen. Archaeologists collected rosaceae pollen from sample locations marked 1 on the entryway garden map.

Photo provided by <https://www.sciencephoto.com/media/32975/view/pollen-grains-of-a-rose-flower>, D. Phillips and Science Photo Library

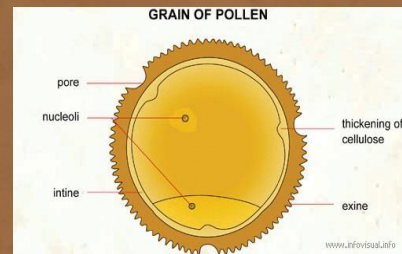


Rugosa roses planted in a different entryway garden at Amache. This hardy variety is still growing even though no gardeners are around to take care of it! Photo provided by Dr. Bonnie Clark, University of Denver Amache Project



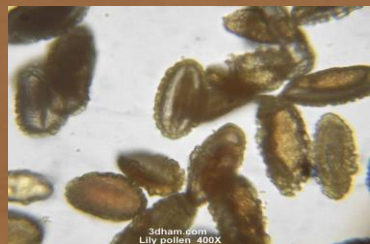
Archaeologists collected a sample of fabiceae (a common variety being sweet pea flowers) pollen from sample location 2 on the entryway garden map. Where would it look at home in this garden?

Photo provided by <https://pixabay.com/photos/sweet-pea-scented-ornamental-plants-2766022/>



A diagram of a grain of pollen. This is the basic structure of pollen.

Photo provided by <https://infovisual.info/en/biology-vegetal/pollen> and Visual Dictionary



A magnified photo of liliaceae (lily family) pollen at 400x magnification. Archaeologists collected a single grain of liliaceae pollen from sample location 3 on the entryway garden map.

Photo provided by <http://www.3dham.com/microgallery/index.html> and John Alan



There are many varieties of lily. One that is native to Japan is the red spider lily. Where would you plant flowers like these in the entryway garden?

Photo provided by <https://pixabay.com/photos/red-spider-lily-korea-incheon-2805197/>

Amache Entryway Garden Archaeology Worksheet

Using the Amache Entryway Garden Excavation map, draw these items in your own map below:

- The subsoil areas and the gravel areas
- Pollen locations
- Location of the pottery sherd
- Locations of the four big, decorative concrete pieces
- Draw in the plants where you might think they were based off pollen and the pottery location
- Using your pencil rake your gravel in interesting patterns

Have fun! Use the resources provided to you, including the map, tape measures, and exhibit guides. You may keep this worksheet when you are finished as a souvenir to show the work you did as an archaeologist to friends and family!

SCALE
|-----|
1 in. ≈ 10 cm.

Archaeological Research of the Highlands Micro School Site (5DV.35208)

Dr. Bonnie Clark, Principle Investigator
Nicholas Dungey, Project Archaeologist
and
Brian Brunst, Archaeologist

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Introduction

In December 2018, Bonnie Clark and Nicholas Dungey hosted a class of 12 students from Highlands Micro School to teach them about archaeology and give them a tour of the University of Denver (DU) Department of Anthropology. Beforehand, the teacher of this class had mentioned that the students had excavated artifacts from their playground. While Clark and Dungey expected only a few objects from a shallow hole, the class brought two boxes with glass fragments, reconstructed ceramics, and a poker chip, to name some of the objects contained in this informal collection. They also mentioned when they presented these objects to us that they had excavated them out of a deep deposit and some items remained in place.

Highlands Micro School currently stands on a site in Denver, Colorado close to the Potter-Highlands Historic District. After the tour and lesson, it was believed that more artifacts in the 4-foot informal unit could create an opportunity for an educational and public outreach component to teach the community about archaeology. Dungey kept in contact with the teacher, Ms. Sara Rove, and Highlands Micro School's director, Ms. Anne Wintemute, to discuss the possibility of an archaeological survey during the summer of 2019. These connections led to the Highlands Micro School Archaeology Summer Camp, a three-week program dedicated to teaching students and parents about the archaeology of Highlands Micro School. The project incorporated impact mitigation, maintenance, and survey of the Highlands Micro School Site.

The findings and methods used in the archaeological study of this site follow this introduction.

The research covered in this report ran in conjunction with thesis research by Nicholas Dungey. Dungey conducted an archaeological ethnographic study for part of his M.A. thesis on intergenerational education in public archaeology. Brian Brunst, the project's research assistant, used the excavated artifacts as part of his senior capstone project for his B.A. in anthropology.

Statement of Objectives

The objectives of this project were threefold:

First, archaeologists wanted to ensure that the site at Highlands Micro School would be properly recorded and maintained. After students had interacted closely and frequently with the archaeological record, personnel from DU knew the impact to the site needed to be mitigated and the informal unit maintained.

Second, Brunst and Dungey headed this project in the field and planned it alongside Clark to satisfy degree requirements for Brunst's B.A. in anthropology and Dungey's M.A. in anthropology with a concentration on archaeology at DU. Brunst is currently using archaeological data gathered from this project in his senior capstone. Dungey is

currently using the archaeological and ethnographic data gathered from this project and the Highlands Micro School Archaeology Summer Camp to study intergenerational education in his master's thesis.

Finally, a public education component became integral to this project. Outreach included using the archaeology at Highlands Micro School to educate students, school faculty, and students' parents about archaeological excavation, methods, stewardship, and the archaeological history of the school.

Public Outreach

Archaeologists worked closely with the faculty from Highlands Micro School to create lesson plans focusing on the informal unit that resulted in the Highlands Micro School Archaeology Summer Camp taking place in June 2019. This public outreach extended to students and parents from the school to provide an educational experience about their school and the archaeology found there. Working in conjunction with Highlands Micro School, archaeologists created a three-week camp that focused on teaching participants about archaeological excavation, survey, and lab work, methods, stewardship, and the importance of archaeology in their community, and allowed participants to participate in excavating the informal unit (Figure 20) and inventorying the uncovered artifacts.

Further public outreach with the school is currently being planned by Dungey and Highlands Micro School, but as of now does not include any more direct interaction with the site's archaeological record.

Environment

Highlands Micro School currently lies within the city boundaries of Denver, Colorado. It sits at an elevation of 1656 m/5433.03 ft. (based off the datum point) across the South Platte River overlooking Downtown Denver. The site covered the entirety of the school's backyard and playground, and a portion of its front yard, fitting into an urban setting and set between Perry Street and Quitman Street. A 1929 Sanborn map of the area around Highlands Micro School has been provided (Figure 15). During site research, the temperature remained stable, with highs between 85 to 95 degrees Fahrenheit on most days with only one day of rain during the three-week Highlands Micro School Archaeology Summer Camp. Unit 5E/2N, the sole excavation unit on-site, hid under playground equipment, namely a slide and wooden platform. That location allowed easy access for children, but more difficult access for adults. A tree sheltering the playground protected the equipment and unit from weather. Soil remained silty clay and dark brown from the surface to 48 cm below surface (cmbs), turning into sandy clay and darker brown from 48 cmbs to the bottom of the unit (108 cmbs), with charcoal, coal, apatite, and wood chip (from the playground) inclusions throughout, and one example of pyrite found (Artifact No. 1.2.58).

Cultural Background and Site History

As stated previously, the Highlands Micro School Site (5DV.35208) is located near the Potter-Highlands Historic District in Denver, Colorado. This district and Denver have a historical record that stretches back to the original pioneers and miners colonizing the region, and a prehistoric record that includes Arapahoe, Comanche, and Ute tribes, as well as Archaic, Ceramic, and Paleoindian period bands.

A Brief Summary of Denver Pre-History

Paleoindians inhabited the Greater Denver Area as early as 12,000 BC, lasting until the Plano culture in 5500 BC. Sites that represent these Paleoindian occupants are few. Examples of Clovis (11,500-9500 BC) and Plano (8500-5500 BC; Stone and Mendoza 1994) objects have been excavated in the Greater Denver Area. Archaeologists have also found Archaic period (5500-1 BC) projectile points at several significant prehistoric sites near Denver, including Magic Mountain and Franktown Cave. Ceramic period (AD 1-1500) peoples are well represented at Franktown Cave, an important site in the Greater Denver Area where archaeologists have found a wide range of perishable artifacts (Nelson et al. 2008).

Ethnohistories, ethnographies, and firsthand written accounts help establish Native American tribes who lived on the plains and migrated around the mountains in the Greater Denver Area at the beginning of Spanish contact in the 16th century. During this time period, the Apache inhabited the plains around this area. The Ute inhabited the mountains to the west. Archaeological evidence of these tribes is thin and difficult to discern, but historical accounts have placed the Apache, Arapahoe, Cheyenne, Comanche, and Ute historically around Denver (Nelson et al. 2008). The Treaty of Fort Laramie further recognized land holdings for different Native American tribes, recognizing the Greater Denver Area as Arapahoe and Cheyenne territory (Leonard and Noel 1990).

Nothing in the current archaeological record at Highlands Micro School suggests that the site is connected to any prehistoric or Spanish contact period context. However, a brief background on the prehistory in the Greater Denver Area establishes who lived within the region before Spanish, Mexican, and later explorers, and Euroamerican pioneers. As of now, the excavated artifacts, census data, and Sanborn maps indicate that the Highlands Micro School site and surrounding historical context dates between 1890 to 1940, after Denver had been founded.



Figure 15: 1929 Sanborn Map of Perry Street, Quitman Street, and 37th West Avenue (Sanborn Map Company 1929); the red oval indicates the future lot of Highlands Micro School (3719 Perry Street)

An Overview of Denver History

Before the Greater Denver Area became United States territory, the Spanish and Mexicans traveled north from New Spain (present-day New Mexico) to this area. This included traders, such as the Hispanos and *comancheros*, and hunters and trappers, such as the buffalo hunters known as the *ciboleros*. Even as this area became United States territory, people of Spanish and Mexican descent still lived and traded with Native Americans in the Greater Denver Area (Leonard and Noel 1990; Nelson et al. 2008).

As Americans traveled west to explore the territory their government had gained through recent land acquisitions, several American explorers passed through the northern Colorado Plains that would eventually transform into Denver, Colorado. Many were unimpressed, including Zebulon M. Pike and Stephen H. Long, who, in the middle of the 19th century, “warned of a great desert west of the hundredth meridian” (Leonard and Noel 1990:3-4). This did not stop trappers and traders from visiting the area to apply their skills and interact with Native American tribes who seasonally occupied the area around the Platte River. It was not until 1850, when Lewis Ralston discovered gold at Ralston Creek, that people started flocking to the Colorado Plains in hopes of finding the precious mineral themselves (Leonard and Noel 1990).

People started to gather around the Platte River in response to the discovery of gold. Few of them found success in mining. That did not stop the small town of tents from expanding while simultaneously pushing away Arapahoe and Cheyenne tribes from their tribal lands. As time passed and expansion continued, family members and men from William Green Russell’s party established the first town in the Greater Denver Area, Auraria, on November 1, 1858 (Leonard and Noel 1990). This event continued to displace Native American tribes who had traditional claim to this land. Auraria became an unruly town of primarily men who focused on mining or applied themselves to different trades as the rumor of gold slowly faded away into disappointment.

Three weeks after the founding of Auraria, General William H. Larimer, Jr. founded the Denver City Town Company on November 22, 1858 to officially lay claim to land he already considered his (Leonard and Noel 1990). This would eventually lead to a rivalry between Auraria and Denver City, until the latter annexed the former. Annexation had its roots in Denver City’s stagecoach connections through the Leavenworth and Pikes Peak Express stagecoach companies. Both companies helped create connections to the Colorado Plains and allowed businesses such as hotels and saloons to flourish.

While many ex-miners started to make a living through other monetary ventures, some continued to pursue the dream of a second gold rush. Miners only found gold dust until January 1859 when George Jackson discovered gold on Mount Evans; May 1859 when John Gregory struck gold veins near what would become Black Hawk; and that same year when William Green Russell discovered gold at the South Platte River (Leonard and Noel 1990; McMahon 2008).

The area grew as word of the next gold rush started to encourage more settlers to move to the blossoming plains town. Eventually, the United States Government created the Jefferson Territory that included parts of present-day Colorado, Kansas, Nebraska, New Mexico, and Utah on October 24, 1859. After Auraria and Denver City came together under one name on April 6, 1860, 'Denver' became the territory's first capitol in an effort to create a government and sense of law in the otherwise lawless frontier lying in the shadow of the Rocky Mountains (Leonard and Noel 1990).

As Denver grew, buildings started to expand outwards, pushing the Arapahoe and Cheyenne tribes further away from their spring campgrounds. While peacefully interacting with American settlers and miners at first, Native American raiders, pushed by their need for food and supplies, led raids on wagon supply trains entering Denver, which disgruntled Denverites. Many tribes did not participate in these raids, but the pioneers treated them as one people, painting all Native Americans as violent. This further supported American pioneers' claims to this land in the American government's eyes, eventually forcing Arapahoe and Cheyenne chiefs to agree to terms with Albert G. Boone. All involved parties signed the Treaty of Fort Wise which effectively gave control of Denver and its lands to the United States government in 1861. That same year, on February 28, 1861, Congress disbanded the Jefferson Territory and created the Colorado Territory, named after the Colorado River (Leonard and Noel, 1990).

Even after Colorado became a state in 1876 and Denver named its temporary capitol that same year (named the permanent state capitol in 1881), the state and city still faced problems such as a typhoid outbreak due to dirty water in 1879 (Leonard and Noel, 1990). Around 1864, Cherry Creek and Downtown Denver also experienced flooding that prompted citizens to search for higher-elevated land. This would lead to change for Denver and its citizens, who searched for other places to live in that were close to, but not in the city.

The Development of Highlands

The area of Highlands, Colorado became one such location. In 1858, General Larimer, Jr. and D.C. Collier staked out land north of Denver, establishing the Highland townsite – a different entity than what would become Highlands. They formed the Highland Town Company in 1859; however, they never did fully incorporate the town (Hunt n.d.; Simmons and Simmons, 1995). This ended the first attempt at creating an urban center in North Denver.

The town of Highlands was not incorporated until 1875, thanks in part to land development in the Potter-Highlands District. Land development and allotment started after the First Baptist Church of Denver, founded in December 1863, was sold to pay off its loans after its founder, Reverend Walter McDuffie Potter, passed away in April 1866 (Denver Public Library 2018; Norgren 1980:11). Land developers would eventually turn this land into a thirty-six-block residential district that would help promote the city as a

place to live after the flood of May 1864 in Denver. The combination of new, allotted land and flooding prompted people who had lost their homes to move to Highlands (Denver Public Library 2018; Hunt n.d.).

As more and more people moved to this new town, local citizens eventually established a village government in 1875 after developers petitioned the Arapahoe County Commissioners for such. A year later in 1876, the Highlands city council signed a town charter (Wiberg 1976) and in 1885, Highlands annexed Potter-Highlands and Highland Park to expand the city (Hunt n.d.). To promote Highlands, citizens touted its “clean air high above the smoke and industry of Denver, clean artesian water, and most important[ly], clean morals” (Denver Public Library 2018). This “artesian water,” originally discovered by R.L. McCormick, was comparably cleaner to Denver’s strained water (Denver Public Library 2018) and resulted in 130 artesian water wells and the founding of the Beaver Brook Water Company in Highlands in 1886 (Simmons and Simmons 1995; Wiberg 1976:55).

Industry had taken hold of Denver as it started to expand. Areas such as Larimer Square became popular for their bars and brothels. Across the Platte River, bar owners found it harder and more expensive to acquire liquor licenses in Highlands, discouraging alcohol vendors from establishing pubs or breweries within the city (Leonard and Noel 1990; Wiberg 1976).

Air also suffered from the industrial movement in Denver, thanks in part to the fumes created by local smelters, whose towering smokestacks dominated the city skyline. Highlanders touted their air quality, prompting tuberculosis patients to move to the blossoming town. Institutions such as the Oakes Home (later renamed St. Elizabeth’s Retreat after 1943) became a shelter for these ill Highlands migrants (Simmons and Simmons 1995; Wiberg 1976).

Citizens emphasized their newfound home’s beauty through its nature. Gardens served to reflect a green Eden. Landscaping started as early as the inception of the town in 1875. Five-thousand trees lined the sidewalks, receiving free irrigation from the town. Members of the Highlands upper-class built gardens to accentuate their houses. As visitors came to Highlands, some would go so far as to compare these luscious human-grown environments to the Hanging Gardens of Babylon, while citizens of different status came together on these lawns to celebrate themselves and Highlands (Wiberg 1976:71). Highlands citizens wanted to exemplify the hard work and life that molded them into “Rhodes scholars at Oxford, presidents of universities, judges, politicians, bank presidents, artists, doctors, lawyers, merchants, [and] craftsmen” (Wiberg 1976:73).

Highlands residents touted their pure morality. The ordinances the city council passed reflected these morals and banned flying kites or playing marbles in the streets, prohibited the use of abhorrent language, and encouraged working men to conduct their business in Denver before traveling home to Highlands for rest (Simmons and Simmons

1995; Wiberg 1976). However, the archaeological record seems to contradict the supposed adherence to these ordinances. Material culture found at the Highlands Micro School Site included such objects as a poker chip (gambling) and amber glass bottle fragments (alcohol, beer, and wine). While its residents wanted outsiders to view Highlands as a Utopia, locals may have decided this view did not apply to their private lives.

Public transportation grew in the 1870s and 1880s in the Denver area. This boom in public transportation allowed more people to commute from suburban cities and towns, like Highlands around 1873 (then called North Denver), to their workplaces in downtown Denver. Electric tramways did not successfully make it to Highlands until 1889 and again in 1891 (Convery 1999; Leonard and Noel 1990; Norgren 1981:10; Simmons and Simmons 1995). The 23rd Street Viaduct was constructed in 1887 in North Denver but was not strengthened to carry cars until 1908 and 1909 (Simmons and Simmons 1995). Gas and electricity followed the expansion of tramways in the later 1800s (Convery 1999; McMahon 2008).

Everything seemed to be working in Highlands' favor as the city pushed to become an Eden of the West, a Utopia (Wiberg 1976). This would not last. The Panic of 1893 stemmed the flow of miners along Prospect Trail (now 38th West Avenue) and added to the financial strains the city had struggled to overcome (Denver Public Library 2018; Wood et al. 1999). Three years after the market crash, the town's city council found it difficult to maintain basic services due to financial problems. On July 24, 1896, residents voted to annex Highlands to Denver (Hunt n.d.; Simmons and Simmons 1995). Highlands had bragged about its purer and higher standards of living, but it could not escape the financial woes that had plagued it since General Larimer, Jr.'s original staking of the area and Reverend Potter's failed attempt at founding the First Baptist Church of Denver.

During the early 20th century, the Denver government constructed viaducts to the Highlands District dedicated to pedestrian traffic and electric streetcars/tramways. Construction projects included constructing the 14th Street Viaduct in 1899, reconstructing and extending the 16th Street Viaduct in 1908 and 1909, and constructing the 20th Street Viaduct in 1911. Ease of access allowed Highlands to grow further, promoting business districts as they appeared next to the tramways, including along 32nd West Avenue in the 1910s and 1920s, and Tejon and Navajo Streets. Meanwhile, the Platte Street commercial area developed during the early 20th century. Viaducts and the vast web of trolley routes improved access to Highlands, allowing residents easy access to public transportation (Simmons and Simmons 1995).

In Highlands between 1893 to 1939, more people had started to move into the area, populating the numerous available lots with mansions and homes (Denver Public Library 2018; Hoehn and Hoehn 2006). This included lots around a future place of education and

site of archaeological excavation: Highlands Micro School. Located at 3719 Perry Street (Figure 1), the lot where the school would be built had been platted in 1893 (Sanborn Map Company 1893). While construction occurred around Perry Street, properties did not appear on Sanborn Map lots until later, even though the 1900 census indicates people lived on some of the neighboring properties prior to the 20th century. Dwellings and automobile garages appeared on the Sanborn map from 1929 (Sanborn Map Company 1929) next-door to 3719 Perry Street. Yet it appears that the current schoolhouse building is the only property to have been constructed on this lot in 1989 (Denver Assessor's Office 2019). Because this lot remained empty until the late 20th century, archaeologists believe that next-door neighbors could have used the empty lot for throwing away their trash, as exemplified by the currently known archaeological record.

Assessment data shows construction on lots next to 3719 Perry Street started in 1890, expanding upon the 1893 Sanborn map. The Denver Assessor's Office shows that contractors originally built upon these neighboring lots between 1890 (3727 Perry Street) to 1919 (4015 37th West Avenue). These data and the archaeological record provide a date range for the Highlands Micro School site from 1890 to 1940. The end date is based on maker's marks and other temporally diagnostic data from recovered material culture at the Highlands Micro School Site and the area's 1940 census record.

Census data indicates that people occupied the houses around the 3719 Perry Street lot during this time period. They included families and members of the working class, including people who worked as brick layers, carpenters, bookkeepers, signal managers at railroads, and woodworkers. Neighbors next to 3719 Perry Street were listed as of German descent, while neighbors who lived along Quitman Street, the street next to and west of Perry Street, were listed as of German, English, Danish, Slovenian, Austrian, and American descent. While house owners along Quitman Street moved in and out of the neighborhood quite frequently between 1890 to 1940, neighbors who lived next to 3719 Perry Street continuously occupied these houses from 1910 to 1940 (Denver Assessor's Office 2019). A myriad of people lived around the future-lot of Highlands Micro School, showcasing some of the diversity in ethnicity and occupation that occurred in Highlands after Denver annexed it.

Previous Research

Little has been done in terms of archaeological research at Highlands, however, architectural surveys of the Potter-Highlands Historic District have been conducted and a historical context has been written. Meanwhile, in Denver, archaeologists have conducted excavation in different areas, including the Tremont House and along the 20th Avenue Viaduct in Downtown Denver. This research has been included to provide extended context for the Highlands area and where it might fit within Denver's archaeological, constructed, and written history.

Highlands Historical Context

R. Laurie Simmons and Thomas H. Simmons (1995) documented the Highlands Neighborhood to identify significant properties and potential historic districts, while also creating a historical context for the neighborhood. They incorporated architectural records and historical accounts to create it, starting with the Townsite of Highland in 1858 to Denver's annexation of Highlands in 1896 to the growth of Highlands in the 20th century. They write details on the development of businesses, infrastructure, and population growth throughout the town's history (Simmons and Simmons 1995).

Historic Structure Assessment of the Highlands Masonic Temple

Tim Hoehn and Kris Hoehn (2006) wrote an historic structure assessment (HSA) for the Highlands Masonic Temple. It is depicted as significant architecture and the City and County of Denver designated it as a contributing structure to the Potter-Highlands Historic District. The main purpose of this HSA was to provide the building's historical significance and maintain it through a preservation plan created by Hoehn and Hoehn for the Highlands Masonic Temple Association. Since construction ended in 1928, the Highlands Masonic Lodge #86 and five other lodges have occupied the building, pushing for more public accessibility in 2002. The temple is neoclassical in design and had few interior changes, but several exterior changes. A portion of the preservation plan addressed this issue and how these changes could be fixed, partially restoring the historical significance and originality of the building (Hoehn and Hoehn 2006).

Potter-Highlands Historic District

The Potter-Highlands District in Highlands is an identified Historic District on the NRHP based on its architectural and historical significance and integrity. Barbara Norgren (1981) conducted an architectural survey of the Potter-Highlands District and neighboring Highland Park (which did not receive designation at the time due to lack of integrity) in consideration of an NRHP designation. Norgren's survey cataloged 1044 total properties, 542 buildings built between 1900 and 1940, 292 buildings built between 1870 and 1899, and 147 Queen Anne style structures. The Denver Landmark Preservation Commission designated a local Queen Anne Historic District in Potter-Highlands as a local landmark district in May 1979. The area contains several different historical structures of note. A full list of the particular historical structures can be found in Norgren's survey report (1981). This includes three structures inventoried by the Office of the State Archaeologist of Colorado (OSAC): Weir Building and Hall (5DV.85.2), Charles Barth House (5DV.83.38), and 3257 Alcott Avenue (5DV.85.45); and a building on the NRHP: St. Elizabeth Retreat Chapel (Oakes Home).

Tremont House

An important founding hotel for those traveling to Denver in the 19th century, the Tremont House Hotel served as a rest stop and venue for tourists and Denverites ranging from the most affluent, such as territorial governors, to the downtrodden at the turn of the 20th century. Construction on the Speer Boulevard Viaduct started in the 1980s, prompting archaeologists to excavate and record the remains of the hotel from 1988 to 1989.

The hotel's history of ownership shifted from owner to owner, starting with its founder Mrs. Maggard ("Mother Maggard") in 1859. She eventually sold the then-named Temperance Hotel to on-again, off-again owner Nelson Sargent who expanded the renamed hotel, the Tremont House Hotel, and made it one of Denver's premier destinations in the 1860s. The hotel ultimately lost its status in the late 19th century and the Denver city government condemned it after the flood of 1912.

The archaeological report provides information on the architectural history of the hotel as it changed ownership. Faunal remains also provided a record of food-related culture that started with more wild game, such as prairie chickens, elk, and, especially, rabbits, during the Tremont's early days to its use of well-cut beef reported on by local newspapers that helped advertise the establishment during its peak. Finally, the rise in imported goods at the Tremont, based off the material culture found in different stratigraphic layers, followed the trend of historical changes in railroads and trade routes over the course of the 19th century, matching the historic economic changes Denver experienced over time (Carrillo, et al. 1993).

Phase I and Phase II Investigations for Colorado Historical Society's New Museum – History Colorado Center

RMC Consultants, Inc. conducted investigations of the History Colorado Center's future location in 2008. Phase I focused on conducting archival research of the area around and within 1200 Broadway. It focused on Sanborn maps, General Land Office (GLO) maps, the Master Title Plat to 1200 Broadway, and historical photographs of the area. However, they could not determine if structures were built before the 1890 Sanborn map, even though J.E. Hendricks and J. Pierce conducted land survey of the area in 1861 and R. Fisher in 1862, and Henry C. Brown patented the area in 1866. They moved on to Phase II, which focused on using GPR survey to locate subsurface features. Lawrence Conyers did find subsurface anomalies 66-132 centimeters below surface (cmbs), with the deepest anomaly at 132-154 cmbs, specifically in the southeast section of the project area. (Killam and Bevilacqua 2009).

Todd McMahon (2008) conducted archival research and wrote up a report on his findings for Phase I. David Killam and Chris Bevilacqua (2009) included this report as Appendix B in their own report on Phases I and II. This report answered questions

revolving around original building locations, general history of the area and Denver, and construction impacts. It also provided a brief glimpse on city utilities and construction/infrastructure in the late 19th century, adding to the resources used in this background to further develop a history on transportation and infrastructure in Denver and Highlands (McMahon 2008).

Both reports provided information on the possible subsurface archaeological material located at this site. Using GPR and McMahon's archival research (2008), archaeologists determined that the identified subsurface remains and structural remains were likely from the 1900s. The deepest structure (132-154 cmbs) was possibly an ancillary structure. GPR and the archival research hinted at GPR and Sanborn map correlations for 23-41 12th Avenue and 1211 and 1215 Lincoln Street. Based on these results from Phase I and II, Killam and Bevilacqua proposed research themes that focused on mobility in a Victorian urban context, urban development, gender and ethnicity, inter-household relations in a high-density setting, and technology-use. They also urged for a Phase III of the project to conduct data recovery, specifically in the southeast corner of the project site (Killam and Bevilacqua 2009).

20th Avenue in Downtown Denver

The 20th Avenue Viaduct Replacement survey took place in Downtown Denver in 1995 and focused on the archaeology surrounding the street. Archaeologists conducted survey to examine the historical archaeological remains of the area, uncovering 11 locales that could potentially yield historic material culture or features. Furthermore, they conducted research on Sanborn maps and census data to research the layout of the historical 20th Avenue and the people who inhabited local dwellings. Combining historic data and the site features uncovered during the survey, archaeologists made recommendations on how to mitigate damage to the site before the viaduct replacement project took place. This included GPR survey, the possibility of a Data Recovery Plan, identifying the area of potential effect (APE), collecting sub-surface material culture, and recording sub-surface features (Carrillo and Clark 1995).

Historical Archaeological Testing and Data Recovery for the Broadway Viaduct Replacement Project

After the original survey and recommendation of a data recovery plan at the 20th Avenue Viaduct Replacement project, an archaeological team followed this recommendation and proceeded with data recovery and excavation of identified features and locales along this project. Their work was extensive, focusing on excavation of 1x1 meter units, trenching, mechanical excavation, consulting Sanborn maps and Denver city census data, test units, utilizing backhoes, identifying main buildings (features) and ancillary buildings (such as outhouses or other such constructs), drawing plan-view and cross-section sketches, photographing, screening through ¼" mesh, and drawing profiles once archaeologists completed excavation. During this work, they gathered data on the

features to understand the architecture of the time in relation to socio-economic status and artifacts such as glass fragments and faunal remains to shed light on day-to-day life in this area from the late 19th to early 20th centuries.

They found features related to small postholes associated with the main structure's porch and other postholes related to a possible outbuilding. Trenching also revealed a portion of the structure's stratigraphy to analyze the layers of archaeological material before and during the destruction of the property. Archaeologists grouped material culture into architecture, fuel/energy, household/domestic, leisure/recreation, personal, subsistence, transportation, industrial, other, glass, worked glass, and Native American.

Archaeologists used these data to conduct analysis and research to understand ethnicity and gender issues of the time period, with a focus on room-use. They found that wire nails were used in construction at this site in 1887 (an earlier date than the initial use of wire nails in Colorado [1890]), few material culture indicating heavy-use of electricity in this neighborhood during this time period, and wild game faunal remains that suggest hunting, as well as remnants of domestic faunal remains from cheaper cuts of meat. This indicates the economic status of the people living in this area and provides data that can be used for future archaeological comparison between sites, such as any future sites at Highlands (Wood et al. 1999).

William J. Convery, III (1999) wrote a report on the utilities people used in this area for this project. Of particular interest to this background on Highlands is the gas, electricity, and tramways the public used located near the 20th Avenue Viaduct neighborhood. Convery mentioned the corruption and competition that led to varying prices of electricity and gas over the course of the 1890s, before ultimately increasing drastically at the turn of the 20th century. Even so, people in the 20th Avenue Viaduct community had access to gas and electricity. Meanwhile, tramways meandered throughout Denver and different suburbs, allowing for an increase in real estate value in relationship to cheap public transportation that started with the Denver Tramway Company (DTC) in 1886. Expanding utilities and tramways influenced suburbs such as Highlands and city growth (Convery 1999). Cheap transportation, gas, and electricity prompted new citizens to move to Highlands. Without these easily accessible resources, the suburb may have never increased in size from its lot-less land speculation of 1858.

Research Methods

Field Methods

This project focused on assessing the archaeological potential of Highlands Micro School, researchers limited field methods to providing enough data to understand the site's time period and how people used it. Brianna Dalessandro conducted GPR survey. Following her work, she wrote a report to incorporate her findings into this project (Dalessandro 2019), which can be found in the appendices (Appendix E).

Archaeologists set up a 1x1 meter unit (Unit 5E/2N) around the informal unit excavated by the students at Highlands Micro School (Figure 16). Working with students and parents from the school, they proceeded to collect artifacts from the unit that students missed, separating Unit 5E/2N into different lots depending on each level's depth (Figure 17). The reasoning behind this method was to uncover what had been left behind by students and had yet to be touched. It provided an easy form of teaching proper archaeological excavation techniques and stewardship, and archaeologists could conduct mitigation and maintenance of the unit.

A datum was set up near the southwest corner of the school. The GPS points and elevation of Unit 5E/2N and the GPR grids were collected using Avenza Maps (Avenza Systems Inc. 2019) on Dungey's iPhone and processed into a basic map of the site (Figures 18 and 19). Locales 1 (the backyard) and 2 (the front yard) on the map are used for artifact location purposes and separating the school's yards from each other. Archaeologists carried out a GPR survey in Locale 2, but no excavation.

Once excavation had ended, archaeologists drew a plan map (Figure 20) and profile (Figure 21) of Unit 5E/2N. Backfilling it preserved the stratigraphy and any remaining artifacts. They left embedded artifacts in place as to not further disturb the unit walls.

Archaeologists collected one isolated find (IF) and recorded its GPS point to place on the site map. They collected it after a student at Highlands Micro School found it while digging for 'mud pies' at the end of one of the excavation days. The artifact (IF 1) was two glass fragments with non-diagnostic lettering embossed on them. IF 1 provides evidence for other possible locations for testing at Highlands Micro School if any future research took place at the site.

Lab Methods

Before constructing a research plan for Highlands Micro School, Brunst and Dungey examined the material culture brought to DU by students and teachers from the school during their tour. This allowed them the opportunity to understand more about what they would likely see on-site.

Once fieldwork had concluded, Brunst and Dungey created an inventory of the site's artifacts in Fall 2019 with aid from Highlands Micro School students and parents in Summer 2019. The inventory was based off Bonnie Clark's database used to inventory the DU Amache Project's collection (Clark 2008). Materials were inventoried based on the locale they were found, on the level they were found (if known), and when they were inventoried numerically. Archaeologists also organized levels into lots, with lot 1 being surface level (0 cmbs), lot 2 being level 1 (0-52 cmbs), and lot 3 being level 2 (52-108 cmbs).

For example, if a ceramic sherd was found in Locale 1 and lot 2 (0-52 cmbs) of Unit 5E/2N and recorded during the inventory as the eighth object from this lot then it would be numbered Artifact No. 1.2.8.

Artifacts found by students before the summer camp followed this same model, but all are labeled as FA/FS 0, Locale 0 (Highlands Micro School backyard BEFORE the summer camp), and lot 0, as their only provenience is having been found in Unit 5E/2N.

For example, if a ceramic sherd was found before the summer camp in Unit 5E/2N and is the eighth object found before the summer camp recorded during inventory, then it would be numbered Artifact No. 0.0.8.

Material culture used to understand the occupation of the site included 6 different classes of items: 1) ceramic, 2) metal, 3) glass, 4) other/composite, 5) bottle, and 6) vessel.

Manuel Ferreira took photographs of objects of interest, such as maker's marks and fully intact objects, and created a photo log of all photos (Appendix in report submitted to OSAC).

After inventorying, photographing, and analyzing objects at DU, Brunst and Dungey returned the artifacts to Highlands Micro School for curation to be used as an education collection as per an agreement between Highlands Micro School, DU, and the Office of the State Archaeologist of Colorado (OSAC).

Results

Results provided an overview of the archaeological assemblage from Unit 5E/2N, data from censuses and Sanborn Fire Insurance Maps, and the GPR survey conducted by Dalessandro.

Unit 5E/2N Archaeological Record

Considering that archaeologists and students only uncovered material culture from Unit 5E/2N, the current archaeological footprint for the Highlands Micro School Site is small, but still rich. Archaeologists inventoried 149 objects excavated by students from before the Highlands Micro School Archaeology Summer Camp (Locale 0) and 91 objects excavated during the 2019 Highlands Micro School Archaeology Summer Camp (Locale 1; Table 7). This inventory includes a single IF found outside of Unit 5E/2N (IF 1) during the summer camp and field work. This IF does support the possibility of other trash pits at the site – an overview of this possibility will follow.

Several diagnostic objects were uncovered that provided clues as to the date of deposition at the site. Most of these objects ranged from the mid-19th century to the mid-20th century, producing a manufacture date range of 1870 to 1937, making this site solely historical temporally. This included objects with maker's marks and other temporal



Figure 16: Unit 5E/2N before excavation and mitigation began



Figure 17: Unit 5E/2N after excavation and mitigation ended

Highlands Micro School Site Topography Map

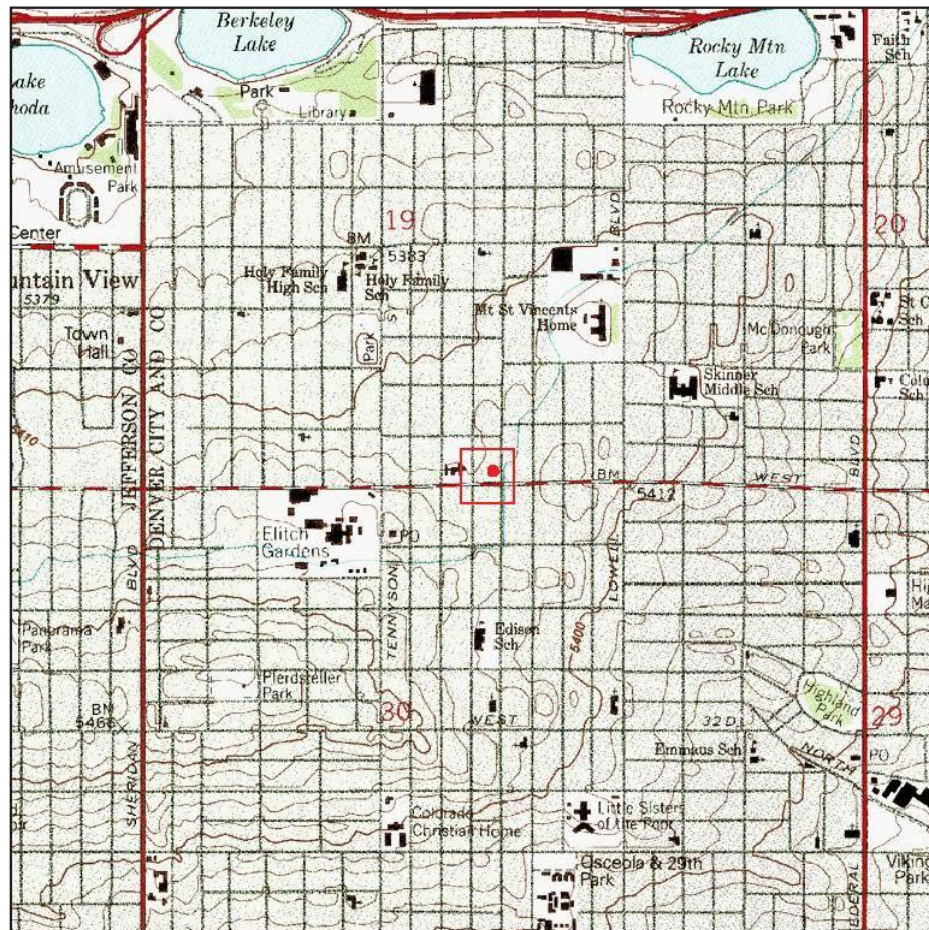


Figure 18: Topo map of the Highlands Micro School Site and surrounding area (TopoQuest 2019); the red square represents Perry and Quitman Streets, and 37th West Avenue; the red dot represents Highlands Micro School

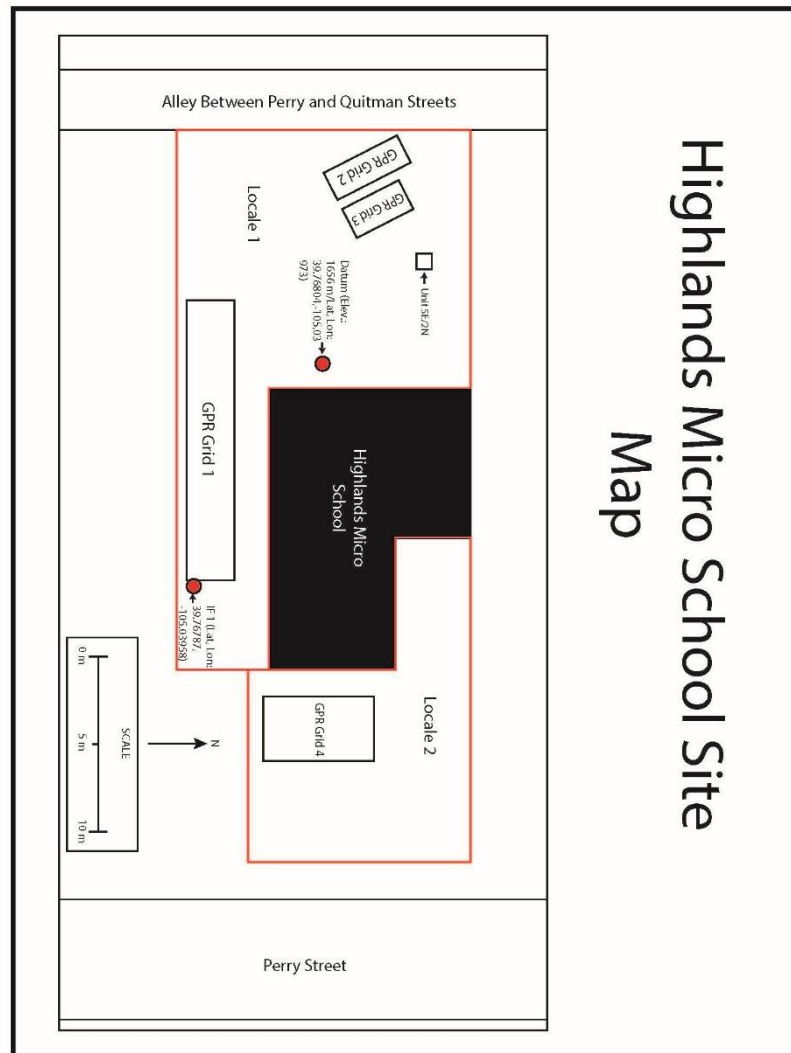


Figure 19: Highlands Micro School Site Map

characteristics more common in the early 20th century than at other times. A basic inventory of all objects can be found in the appendices (Appendix in report submitted to OSAC).

Most of the artifact assemblage consisted of glass bottles that ranged from medicinal to cosmetic to alcoholic in use. The appearance of several amber bottle fragments and bottles that may have contained wine (Artifact No. 0.0.8; Figure 25) is interesting to note since, as stated previously, Highlands prided itself on its morals, Utopia-esque laws, and heavy taxes on liquor licenses. More research into the archaeological record on consumption and purchasing of alcohol in Highlands could provide evidence of citizens

ignoring the liquor and alcohol laws boasted by the city council. However, this one site only provides a brief glimpse into the archaeological record and most of these bottles do appear to be from the turn of the century, after Denver annexed Highlands. Therefore, the local government may have allowed liquor sales.

At this point, it must also be noted that certain objects found in Unit 5E/2N may be from a non-historic context. Students also left the informal unit improperly covered, pushing smaller artifacts they left on the surface during their original excavation into the bottom of the unit (108 cmbs) with dirt and woodchips covering them up over time. Students did tell me that most of the objects excavated before the summer camp (FS 0) came from a hole in the west wall at the bottom of the unit they dug out to uncover more objects. This provides some provenience.

Based off the profile (Figure 21) and pictures (Figures 23 and 24) of the west wall, it can be seen that many of these artifacts may have been found beneath a grey layer of dirt and debris that had charcoal inclusions (45-108 cmbs). Students further confirmed this information, stating that they found most of FS 0, Lot 0 below this layer. This provides a relative depth in cmbs for where these trash pits and archaeological caches may be found if further excavation is conducted at the Highlands Micro School Site. However, it should be noted that the students did find IF 1 closer to the surface (34 cmbs) than the objects students found in Unit 5E/2N before the summer camp.

Most of the objects were broken, even though the assemblage did include most of the sherds and fragments needed to reconstruct some bottles and vessels (as evidenced by students' and teachers' attempts to glue these objects back together). This further supports the possibility of Unit 5E/2N being a trash pit.

The main purpose of the inventory of the archaeological record of Unit 5E/2N was to provide a picture of the artifacts that could be found on this site. It is also used in comparison with census records and Sanborn maps to understand who could have contributed to this archaeological record in the past. Finally, future research can use the objects from this site (and future collected objects, if possible) as a comparison between archaeological assemblages found in surrounding areas, such as Denver or Boulder.

Censuses and Sanborn Fire Insurance Maps

According to Sanborn Fire Insurance Maps from 1893 and 1904 (Sanborn Map Company 1893; 1904), land developers had set aside the lot of land where Highlands Micro School stands for construction. However, according to those same maps, it appeared that no one had built upon it during those years. A Sanborn map from 1929 indicate that no construction had occurred on the property by then, either. The first neighboring property was constructed in 1890, meaning that while the future lot of Highlands Micro School was empty, it was a nearby place to dispose of trash. These next-door properties were either dwellings or automobile garages (Sanborn Map

Plan Map of Unit 5E/2N

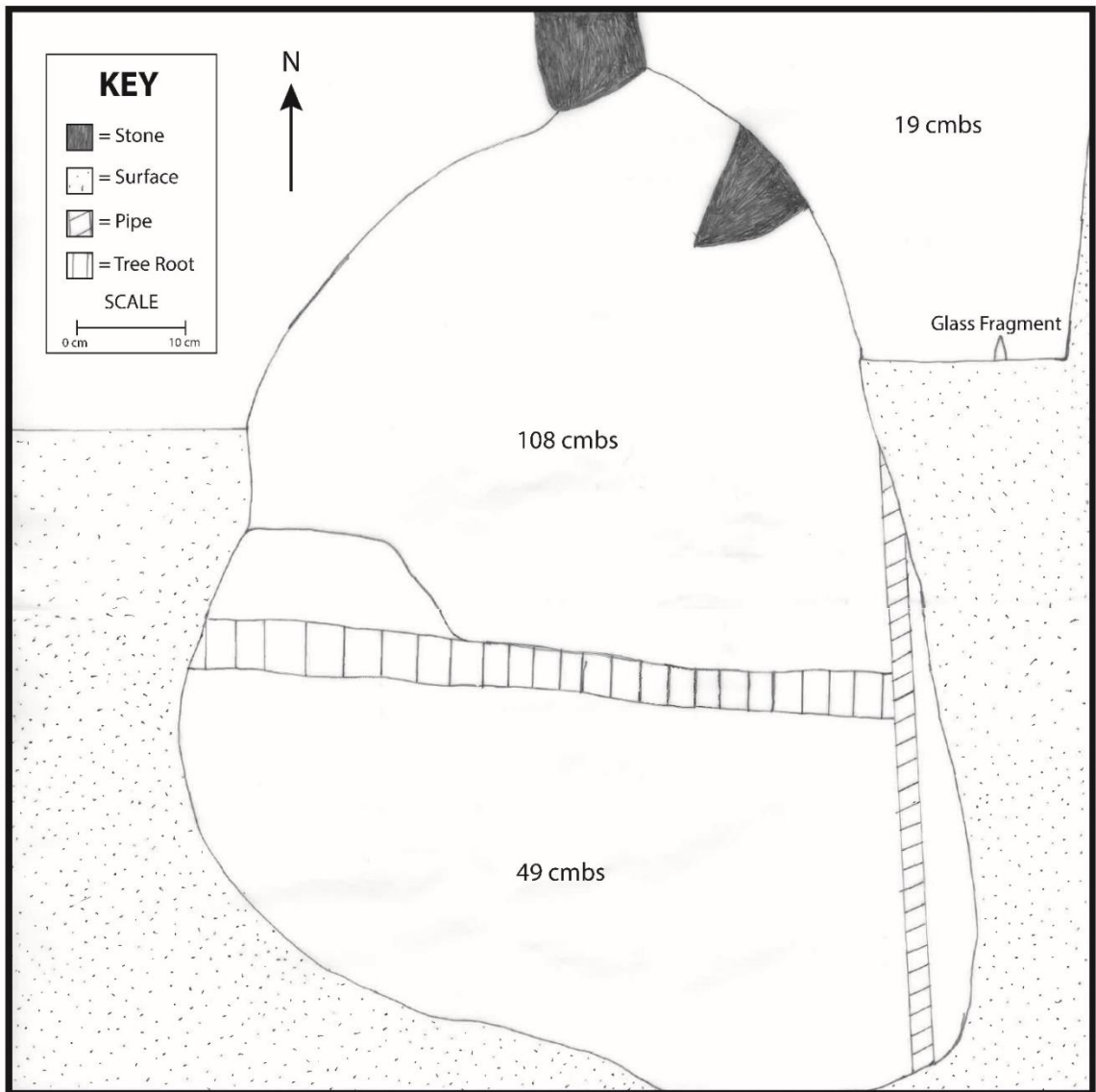


Figure 20: Plan map of Unit 5E/2N

Profile of Unit 5E/2N West Wall

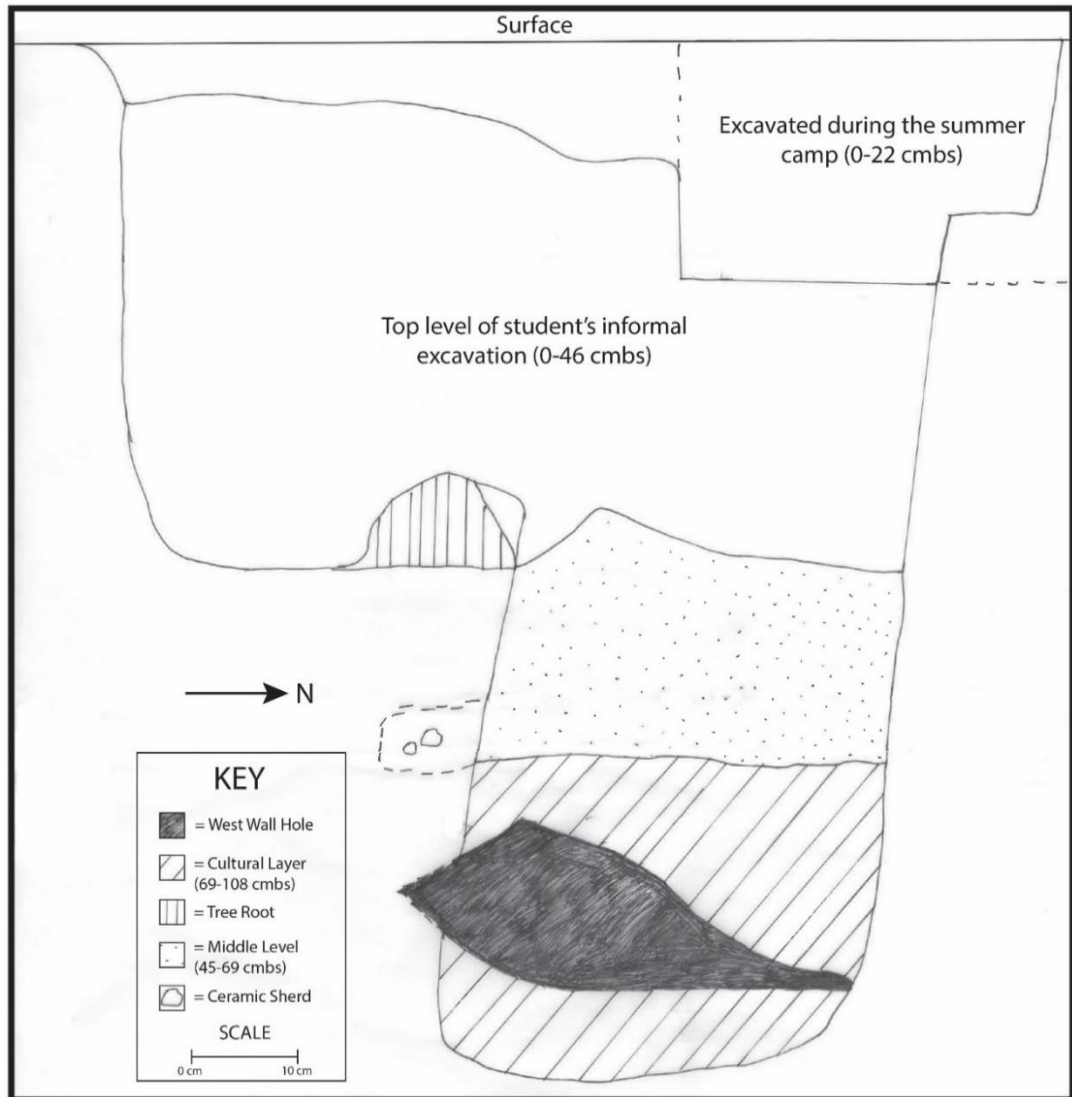


Figure 21: Profile of Unit 5E/2N's west wall



Figure 22: Highlands Micro School students excavating and maintaining Unit 5E/2N; photo taken with permission

Materials	Locale 0	Locale 1	Grand Total
Ceramic	78	20	98
Glass	46	43	89
Metal	13	17	30
Other/Composite	12	11	23
Grand Total	149	91	240

Table 7: Table of the total count of objects found by material type and locale



Figure 23: Picture of bottom of hole and stratigraphy



Figure 24: Picture of Unit 5E/2N west wall stratigraphy; the "west wall" hole is at the bottom



Figure 25: Picture of Artifact No. 0.0.8, a clear glass base fragment with the word "WINE" molded onto its base. Photo courtesy of Manuel Ferreira.

Company 1929). Property reports for Denver state that the current property was built in 1989 and Highlands Micro School established at this location in 2015 (Denver Government 2019).

Further analysis of census data and accessor's records reveals that the neighbors surrounding this empty lot were families and members of the working class, including those who worked as brick layers, carpenters, bookkeepers, signal managers at railroads, and woodworkers. Families that occupied this area appeared to have been primarily descended from ancestors that migrated from Western Europe. Census enumerators listed next-door neighbors to 3719 Perry Street as of German descent. Neighbors living along Quitman Street, separated from Perry Street by an alleyway, were listed as of German, English, Danish, Slovenian, and Austrian descent.

Those who lived in the houses along Quitman Street appeared to move in and out of the houses. Census data show that new families moved in and out of Quitman houses between 1910 and 1920, and again between 1920 and 1930.

However, based on census data, the Wacker family who lived on 3727 Perry Street (to the right of 3719 Perry Street when facing west) and the Wegner family who lived on 3705 Perry Street/4015 37th West Avenue (to the left of 3719 Perry Street when facing

west; census collectors used these two addresses interchangeably for this lot) occupied these dwellings from 1910 to 1930 and 1920 to 1940, respectively.

Assessor's records expand upon the census data, providing building dates for surrounding lots as early as 1890. Based on the archaeological record and Sanborn maps, it can be hypothesized that neighbors used Unit 5E/2N as a trash pit before contractors built the currently standing building and Denver had organized waste disposal. Using IF 1, it can further be assumed that other trash pits and artifact caches may remain under Highlands Micro School's playground. To understand if these other trash pits did exist, Dalessandro conducted GPR survey in the school's back and front yards.

GPR

Brianna Dalessandro's GPR report (2019) did discover anomalies below ground. Dalessandro conducted a GPR survey after examining the Sanborn maps and seeing that lots had been built near the school's current location. Since background resources appear to hint that construction did not commence here until the 1980s, the anomalies could be more trash pits, ditches, or disturbance by construction and additions to these lots. This interpretation is better explained by Dalessandro in her report.

To summarize it briefly here, it appears that more anomalies do appear in the playground/backyard area (Locale 1) at the Highlands Micro School Site, but not in the front yard (Locale 2). Correlating this data with what is known of Unit 5E/2N's archaeological record, IF 1, and analysis of Sanborn maps, assessor records, and census data, it is hypothesized that there could potentially be more archaeological assemblages or trash pits below the surface. However, the GPR survey found little conclusive evidence for trash pits, although Dalessandro does not completely dismiss the possibility. Based on IF 1, archival and historical research, and what students and teachers from Highlands Micro School have told me about the site, I believe more subsurface archaeological assemblages could exist.

Unfortunately, GPR survey did not record subsurface anomalies below 25 cmbs. Archaeologists did not carry out further survey at deeper levels due to time constraints and using GPR as an educational component for public outreach with the Highlands Micro School community.

Conclusions and Recommendations

Findings

While excavation at the Highlands Micro School site was limited to Unit 5E/2N, correlating the archaeological record with Sanborn maps and census data provides a more in-depth understanding of what archaeologists found at the site.

After analyzing the Sanborn maps and consulting the Denver accessor's records, archaeologists found that no one had constructed any building at 3719 Perry Street until 1989. This means that any archaeological record found here likely originated from neighbors next to and behind the Highlands Micro School lot. Most of the artifacts were broken, except some intact bottles, for example, Artifact No. 1.2.2 (Figure 26). Bringing these two pieces of information together points at Unit 5E/2N likely being a trash pit neighbors used.

Dalessandro's GPR survey also detected anomalies below surface, however these are likely not trash pits or archaeological assemblages. Although that may be the case, IF 1 further supports the hypothesis that there may be more archaeological assemblages at Highlands Micro School. However, this may just be lightly buried trash rather than an indicator of a trash pit. Further research would need to be conducted on site to support or refute this hypothesis, though that may be difficult or impossible considering this site is located on private, school property (see Crane 2000 for a case study on urban trash disposal and sanitary reform in Washington, D.C.).

Census data shed light on the people who lived next door to 3719 Perry Street, showing some of them immigrated to Colorado from Germany – such as the Wacker family who lived next door at 3727 Perry Street from 1910-1930. Others, meanwhile, moved to Highlands from midwestern states such as Illinois and Indiana – the Ekle family living behind 3727 Perry Street at 3702 Quitman Street in 1910 – and Michigan – Frank Rengel and Therese Rengel, his Austrian wife, who lived at 3728 Quitman Street in 1910. Amelia Frederick also moved to Highlands in 1920 from New York (Appendix in report submitted to OSAC).

Some of the diagnostic objects originated from the East Liverpool Potteries Company, based in East Liverpool, Ohio. Artifacts with this specific East Liverpool Potteries Company maker's mark were placed on company products from 1901-1907 (Artifact No. 0.0.41; Figure 27; Carnegie Public Library n.d.).

Archaeologists also found sherds of a near-complete Balanced Rock commemorative plate with the Bauer, Rosenthal and Company (B.R.C.) maker's mark (Artifact No. 0.0.130; Figure 29). The Bauer, Rosenthal and Company ceramic makers operated from 1897-1903. What is interesting about this artifact is the B.R.C. was a short-lived German ceramics company. I have not been able to find another example of this commemorative plate. That is not to say that others do not exist, but this may have been a short-lived collector's series made by B.R.C. to commemorate Balanced Rock at the Garden of the Gods in Colorado Springs, Colorado. Another interesting aspect of this artifact is that it was a commemorative plate of an American natural landmark made by a German company (Collect Rosenthal n.d.). Census records indicate that the next-door neighbors on either side of 3719 Perry Street were German households. I attempted to contact the

city archaeologist for Colorado Springs about this artifact for further information but did not receive a response in the time of writing this report.

Archaeologists found ceramic sherds with Meissen and Dresden maker's marks, a ceramics company in Germany (Artifact No. 0.0.85; Figure 28) and a sherd (Artifact No. 0.0.65) with the Victoria Carlsbad maker's mark (Figure 30), another company from Austria. The Meissen and Dresden maker's marks did not match any known Meissen and Dresden maker's marks. Based on research, it appears that the Potters Co-operative Co. in East Liverpool, Ohio made ceramic dishes with the global Dresden maker's marks from 1890-1910 (Gretchan n.d.; Zumbulyadis 2009). Meanwhile, the specific Victoria Carlsbad maker's mark found on ceramic sherds dates from 1891 to 1908 (Stein Marks n.d.). These objects exemplify pottery brought by people immigrating and moving to Highlands at the turn of the 20th century, likely owned by the German and Austrian immigrants that called this neighborhood home. Finally, the Owens-Illinois Glass Company made the fully intact make-up bottle (Artifact No. 1.2.2; Figure 26). The specific maker's mark here dates from 1937 and was made by a plant that ran in Chicago Heights, Illinois from 1930-1940 (Angel Fire n.d.). Thomas Berry, according to the 1930 census, lived in 3702 Quitman Street and moved from Wisconsin, while Catherine Sweeney lived in 3728 Quitman Street and moved from Illinois, before the Moore family moved to this address between 1930 to 1939 from Iowa (according to the 1940 census).



Figure 26: Picture of Artifact No. 1.2.2, a make-up bottle; remnants of dirt and, possibly, previous contents inside. Photo courtesy of Manuel Ferreira.



Figure 27: Picture of Artifact No. 0.0.41, ceramic sherds that form "EAST LIVERPOOL CERAMICS CO." maker's mark. Photo courtesy of Manuel Ferreira.

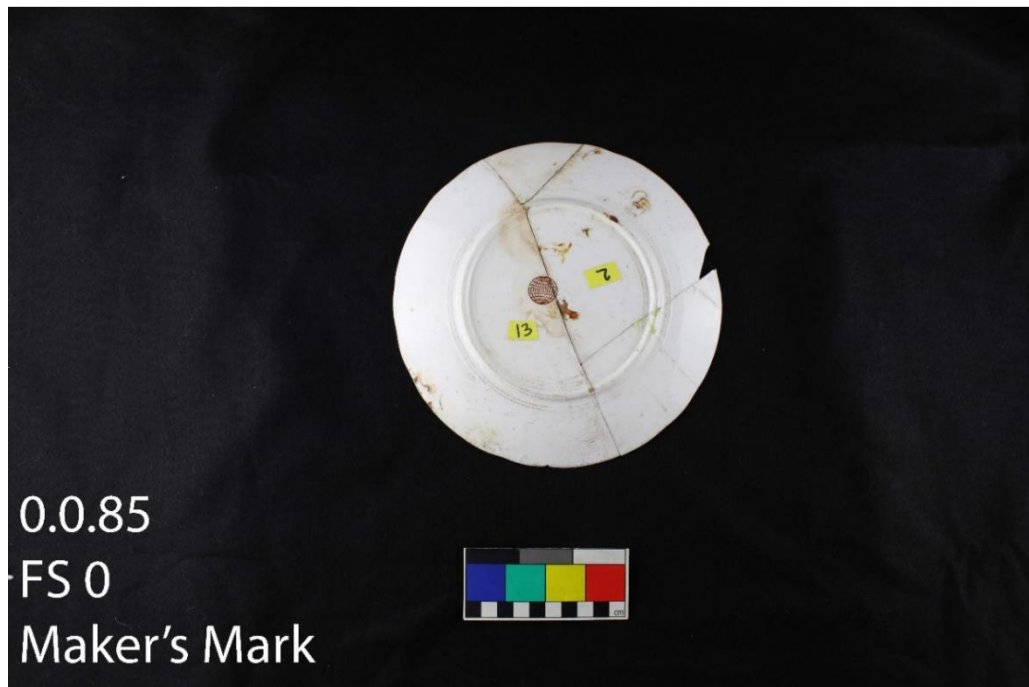


Figure 28: Picture of the back of Artifact No. 0.0.85 with the "DRESDEN" maker's mark. Photo courtesy of Manuel Ferreira.



Figure 29: Picture of Artifact No. 0.0.130, ceramic sherds come together to create the "B.R.C." maker's mark. Photo courtesy of Manuel Ferreira.



Figure 30: Picture of Artifact Number 0.0.65 with the Victoria Carlsbad maker's mark. Photo courtesy of Manuel Ferreira.

While Owens-Illinois Glass Company mass-produced this specific bottle, it could have belonged to one of these households, showing that Unit 5E/2N may have still seen use as a trash pit in the 1930s and possibly in the 1940s.

By matching data like this with census records and Sanborn maps, it is all the more likely that neighbors used the 3719 Perry Street lot to throw away their trash. Comparing these data sets provides a more robust and all-around examination of the Highlands Micro School site and how people used it before contractors constructed the school building. Using these artifacts and Denver assessor records, archaeologists have determined that neighbors used this specific trash pit during and after the turn of the 20th century, its use likely spanning from the 1890s to, possibly, the 1940s.

Future Research

This site may be small in comparison to other archaeological sites in Denver, but the potential to expand upon it exists. Further survey or excavation could occur in the Highlands area, providing future opportunities to engage with the north Denver archaeological record, which has hardly been touched by archaeologists. At the same time, comparing archaeological records from Denver with Highlands cannot be ignored.

Such future research can include, but is not limited to:

Archaeological Comparison to Denver

Historical records depict Highlands as aiming to become a Utopia or Eden. They did this through several laws and regulations that limited or removed such things as gambling, drinking, and foul language. A comparison of archaeological records to Denver archaeological sites can provide a better understanding of the material and day-to-day differences between the two cities before and after Denver annexed Highlands.

Cultural Practices in a Perceived Utopian Society

Considering the original Utopian views of Highlands, further research of the archaeological record at Highlands sites could provide information on the residents following these views. After all, the Highlands Micro School site produced alcohol containers/bottles and a poker chip, indicating these ordinances were not always adhered to. Were laws that banned these practices frowned upon behavior limited to the public-eye, and ignored behind closed doors? Did Highlands citizens frequent locations in Downtown Denver known for more rowdy activities, such as Larimer Square? Did people in different socio-economic circles believe these Utopian practices and laws did not apply to them?

Socio-economic Changes after Denver Annexation

In 1896, Denver annexed Highlands, which had touted itself as a pure-in-morals locale that featured manors on lots taking up whole blocks. However, after Denver annexed the Utopian town, realtors started to divide these blocks into smaller lots for working-class and middle-class families. These historical changes imply that more working-class families started to move to Highlands after annexation. What changes occurred in the Highlands economy and social stratification/order after Denver annexed the town? How did the material record change overtime from before annexation to after annexation? Questions and research that focuses on these changes can provide information on how the people and society changed during this key point in Highlands' history.

Recommendations

While archaeological excavation or survey at Highlands Micro School may not need to continue, it would be worthwhile to keep in contact with the school through education and other means. This can include tours of museums such as History Colorado Center or archaeological sites open to the public, continued teaching of archaeology after Brunst and Dungey return the materials to the school, and public outreach with the school. By expanding upon the educational opportunities initiated by the Highlands Micro School Archaeology Summer Camp, students, teachers, and parents have the opportunity to engage this particular public in a community-engaged archaeology that can provide lessons on stewardship and importance of a community's past.

Meanwhile, future archaeologists can use this report and inventory as a comparative collection for future projects. It can also serve as an introduction and overview of related projects, Highlands history, and the Highlands archaeological record.

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Report on the ground-penetrating radar survey at Highlands Micro School, Denver, Colorado

Prepared for: Nick Dungey, University of Denver

Prepared by: Brianna Dalessandro, University of Denver

July 5, 2019

Introduction

In the fall of 2018, Highlands Micro School discovered a midden of historic artifacts buried beneath their playground in the backyard. The school contacted and visited the University of Denver where Bonnie Clark, Nick Dungey, and volunteers created a curriculum for the students during a field trip to learn about archaeological methods. Dungey later led a summer camp centered around archaeology for the school in June of 2019.

Four small ground-penetrating radar grids were collected at Highlands Micro School in Denver, Colorado in late June of 2019. These grids encompassed, although small, a majority of the open space located in the school's back and front yards. The aim of the survey was to teach elementary school students about ground-penetrating radar. The students participated for the first grid and were later shown an example of the final images so that they could help with the analysis. This survey was also completed to take inventory of the subsurface features.

The Highlands area was founded in the 1860s and was known as an escape for the industry in Denver (Wiberg, 1976; Simmons and Simmons, 1995). This area was later annexed into the city of Denver and has built up over time. According to the Sanborn maps, the area began to develop in the early 20th century and while many houses and a garage appear over time, the house that is now Highlands Micro School is the only building located on its present-day lot as of 1989 (Denver Assessor's Office, 2019; Sanborn Map Company, 1893 and 1929). It is hypothesized that the historic artifacts found buried on the lot are from historic dumping when the neighborhood was forming during the early 20th century.

Methods

Ground-penetrating radar (GPR) is a geophysical method that measures the differences in the water retention of materials beneath the ground surface (Conyers, 2012). The GPR system sends pulses of radar energy into the ground which reflect off of

various buried discontinuities and are recorded by the system. This data can be processed into two different types of imagery: profiles and aerial frequency maps.

This survey was completed using a 900 MHz antenna at 25-centimeter spacing. This antenna was used because many of the deposits were found at relatively shallow depths and within tight spaces. The survey wheel was used for distance calibration and the time nanosecond window was opened to 25 ns. The rest of the parameters were kept the same for all four grids.

The first grid was originally a 3-meter by 17-meter grid in the side yard and was used as the teaching example for the summer camp kids. This meant that they were able to participate by standing at the designated meter marks for the transects while others got to take turns pushing the GPR cart. Unfortunately, there was an error in spacing during the collection and the grid finished one profile early. This grid was processed as a 2-meter by 17-meter grid instead. Dungey said it was unnecessary to recollect the grid at this time because the teaching component was more important. This grid was collected at the site's southeast corner while the others were collected in the southwest corner.

The next two grids shared a baseline and were collected beneath and around the swing set area in the backyard. Grid two, which was beneath the swing set, was two meters by five meters. Grid three was two meters by three meters and began at the three-meter mark along the baseline. The final grid, grid 4, was collected in the front yard and was four meters by six meters. Depths in all four grids were calculated using the relative dielectric permittivity (RDP), which is a proxy measurement for velocity (Conyers, 2012).

Data Analysis

Grid 1

Grid 1 mainly displayed planar reflections which are marked by the red squares on the slice maps. Planar reflections denote a physical discontinuity beneath the surface which can include examples like the water table, a buried soil horizon, or a compacted surface where water settles (Conyers 2013, 59). These reflections typically do not show up well in slice maps because the planar reflections are only completely flat under specific circumstances. The water saturation levels along this surface vary and therefore cause the reflection to record at various depths as well (Conyers 2012, 153). The majority of the planar reflections in grid one occur in slice one and slice three. Using an RDP of 14, the depth of the planar reflection in slice three occurs around 24 centimeters below the present-day surface. The planar reflections in slice one occur at around 16 centimeters.

The planar reflections in grid one are evident in the GPR profiles (Figure 2). File 108 in grid 1 shows a low amplitude reflection and slightly sloping. This likely indicates a slight

topographic change below the surface. The variation in this reflection could also have occurred because of differences in water saturation levels. The difference between the two GPR profiles in the examples illustrated in Figure 2 is that there is a smaller difference in water retention between the two layers that is creating the interface. Stark

Grid 1

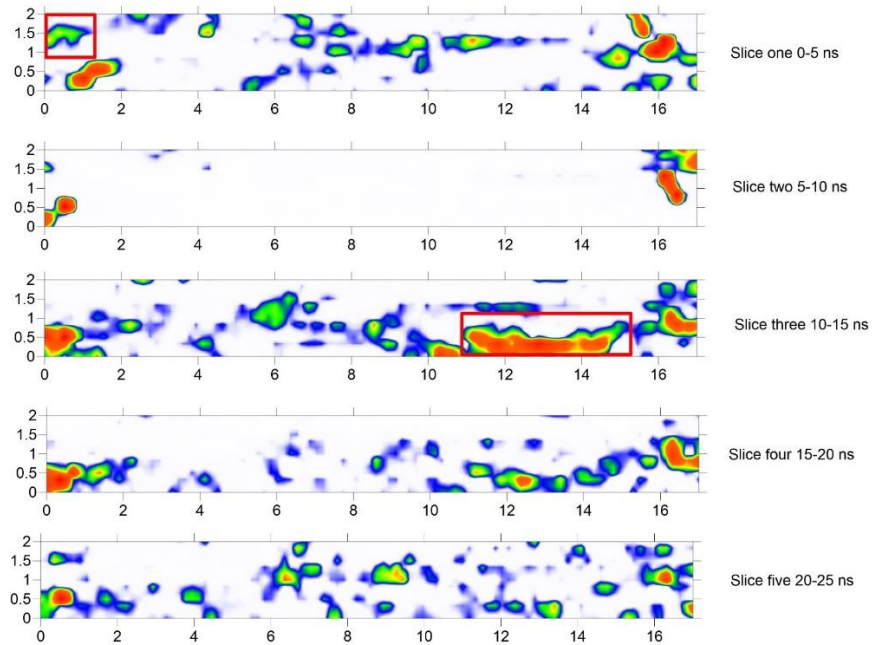


Figure 1: Five slices for grid 1 with marked planar reflections.

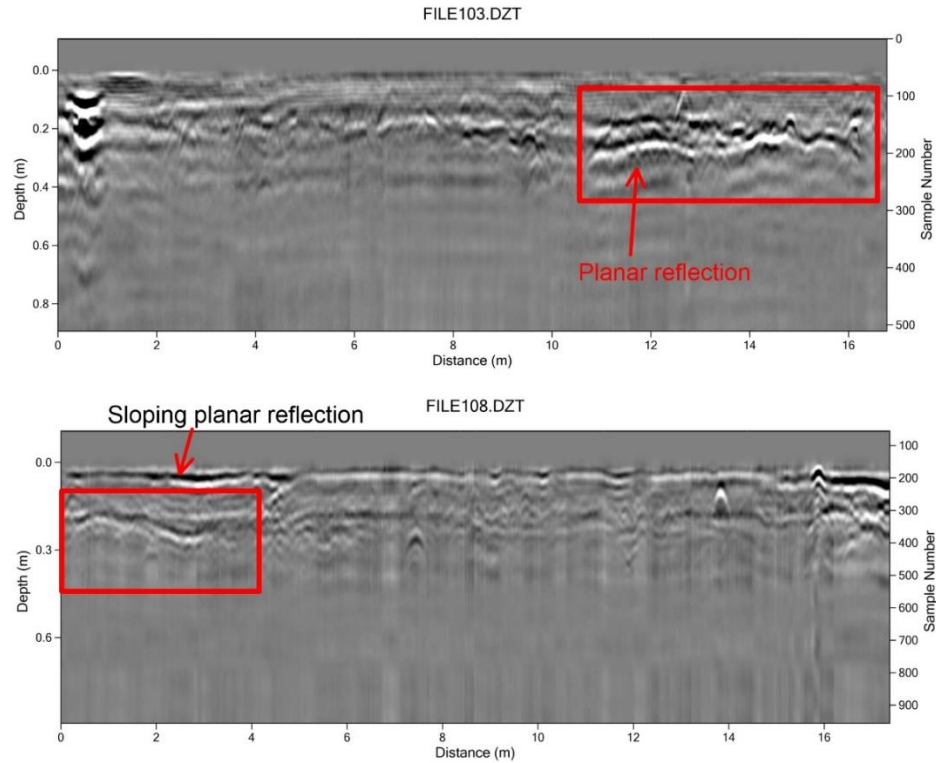


Figure 2: Examples of the planar reflections that occurred in two separate parts of the grid.

differences create higher amplitudes whereas the smaller differences create lower amplitudes (Conyers 2012, 36).

Grid 2 and Grid 3

Planar reflections are also occurring in grid two, except that these reflections are occurring throughout almost the entire grid. There are slight interruptions of these reflections within this grid because they are not seen continuously throughout the GPR profiles. The red squares in Figure 3 denote where the planar reflections are continuous within the grid, according to the profiles. The landscape in this area is relatively flat but the high-amplitude reflections actually slope upwards to the present-day ground surface. This compacted surface is still partially buried between 13 and 16 centimeters below the surface. The depths for this grid may vary because there were no hyperbolic reflections to test for the RDP. To gather information on exact depths, an excavation unit would need to be opened to conduct RDP tests. An RDP of 14, which was assigned to grid one through hyperbola fitting, was given to this grid due to their close proximity.

Grid 2

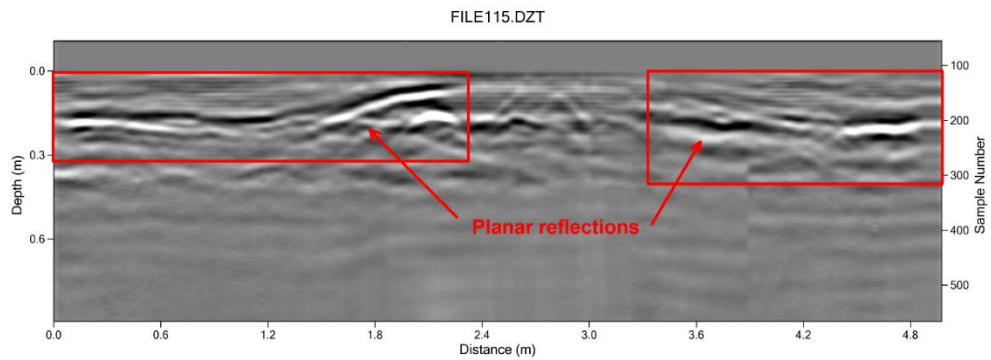
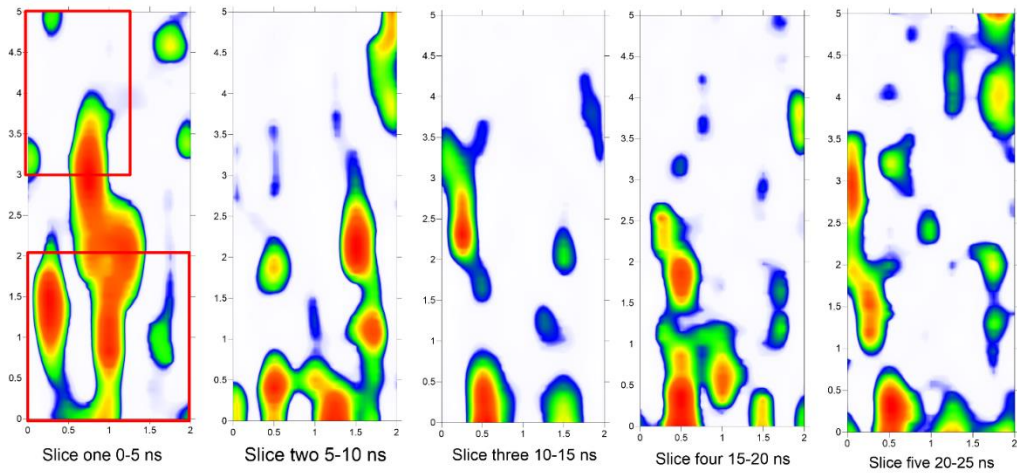
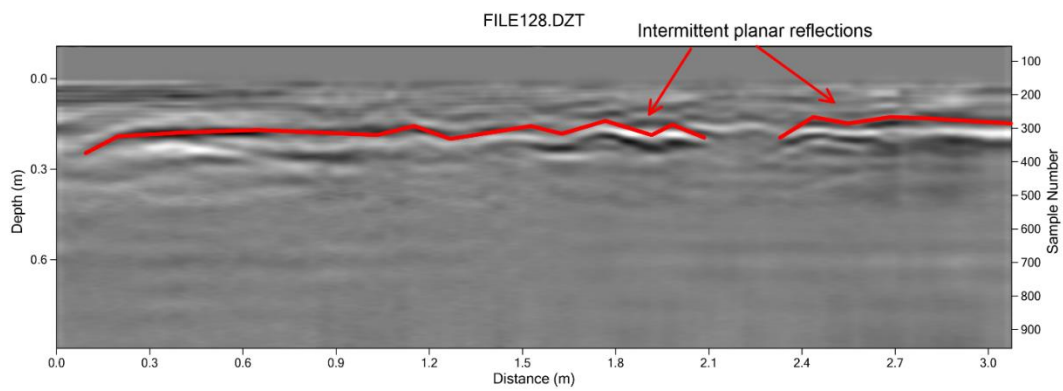


Figure 3: The slices of grid 3 and an example of the planar reflections.



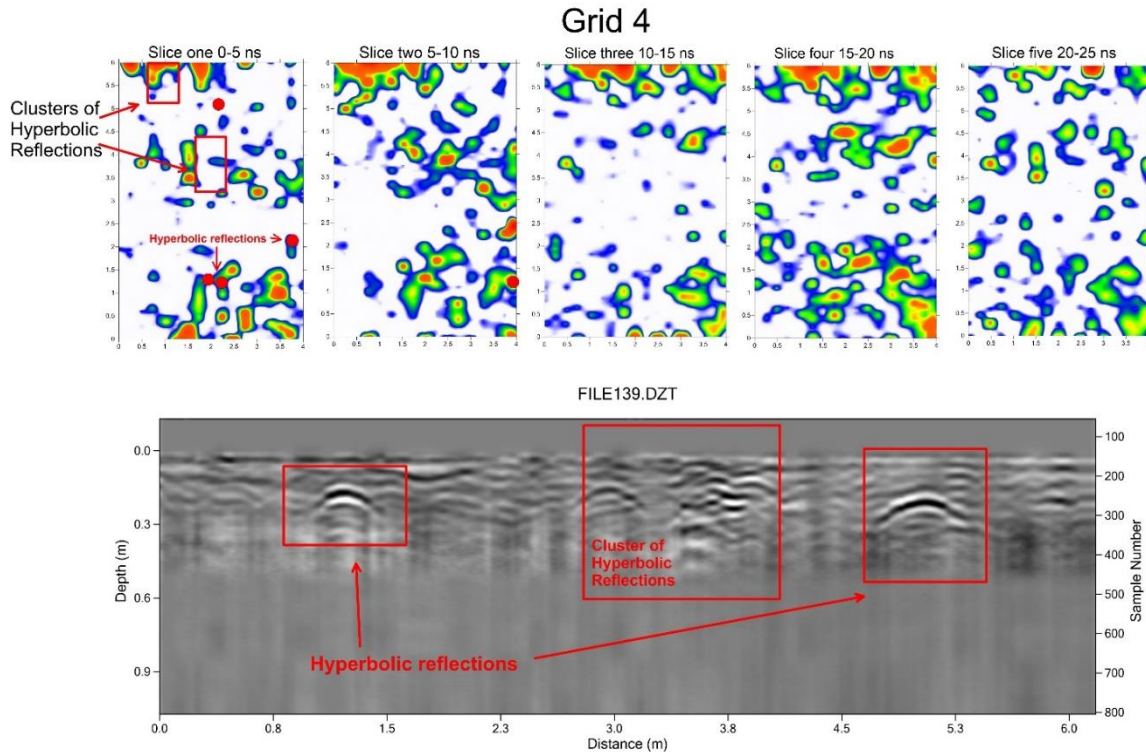


Figure 4: Grid 4 profiles and slices

Again, because of the close proximity to the two previous grids, grid three was assigned the same RDP of 14. This grid also showed planar reflections throughout the grid that are discontinuous throughout the profile. This grid was collected as a second grid rather than a region of grid two because there was playground equipment in the way that the radar equipment could not get around easily.

Grid 4

Grid four was the only grid at the survey site that did not have any planar reflections. Mainly the grid only had hyperbolic reflections, both in clusters and isolated. All of these reflections are mapped within their relative slices and occur between 13 and 16 centimeters below the surface. The RDP for this area was calculated to be 9.7 by hyperbola fitting. Because they are close to the surface and the school was once a house in a neighborhood, some of these reflections may be utility lines. However, none of the reflections seem to occur in the same areas or within a line, which would be expected for a utility line. These reflections could also be tree roots because there are trees in the front yard that are found within and just outside of the small grid (Conyers 2012, 142).

Interpretations and Conclusions

Altogether the planar reflections in the backyard can be explained by compacted surfaces. The areas where grids 1 through 3 were placed were likely highly trafficked

areas even into present times. Grid 1 was collected in the space between the school's shed and the schoolhouse. Currently, this area is a play area for the children at the school, however in historic times this area was probably compacted by foot traffic over time, which would explain the planar reflections found within the grid. Grids 2 and 3 are also in an area that would be highly compacted because they are both located closely to the alleyway. After the house was purchased in this neighborhood for the school, the back and side yard were probably levelled out through the addition of dirt when the extensive playground was built.

It is hypothesized that the buried concentration of trash was dumped during historic times when the neighborhood was starting to become more popular. If dirt was brought in to level out the playground area, the trash would have been buried as well as the previously compacted areas. Grids 1-3 have shallowly buried compacted surfaces while the front yard has isolated hyperbolic reflections that could be buried utilities or tree roots. Even though there is no other evidence of buried trash middens, there are still large portions of the yard that are left un-surveyed because of the size limitations of the GPR equipment, landscaping, and playground equipment. The 900 MHz antenna is used to look for shallow cultural deposits. However, the attenuation of the waves begins to occur at about 25 centimeters below the surface so the cultural deposits, which start at about 35 centimeters below the surface, were not viewable within the GPR profiles. Overall, this survey was also successful through the creation of curriculum for school age children, allowing them to participate in archaeological methods that may not be accessible otherwise.

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Appendix F: Chi-Squared Tests

Chi-Squared Individual Survey Questions Totaled

Survey Question	Pre-Survey	Post-Survey	Total	Normalized Value	Normalized Pre-Survey	Differences	Squared	Squared/Normalized Pre-Survey
Q3	35	35	70	1.004405286	35.15418502	- 0.154185022	0.023773021	0.000679229
Q4	57	53	110		57.25110132	- 4.251101322	18.07186245	0.340978537
Q5	57	46	103		57.25110132	- 11.25110132	126.5872809	2.751897412
Q6	32	35	67		32.14096916	2.859030837	8.174057327	0.233544495
Q7	34	36	70		34.14977974	1.850220264	3.423315026	0.095092084
Q8	36	36	72		36.15859031	- 0.158590308	0.025150886	0.000698636
Q9	32	34	66		32.14096916	1.859030837	3.455995653	0.101646931
Q10	30	34	64		30.13215859	3.86784141	14.96019717	0.440005799
Q11	38	38	76		38.16740088	- 0.167400881	0.028023055	0.000737449
Q12	30	32	62		30.13215859	1.86784141	3.488831532	0.109025985
Q13	33	38	71		33.14537445	4.854625551	23.56738924	0.620194454
Q14	40	39	79		40.17621145	- 1.176211454	1.383473384	0.035473677
Total	454	456	910		456	D.F.=11; CV=19.68	$\alpha=0.05$	$\chi^2=4.72997468707034$
Normalized	456	456						

Chi-Squared Individual Participant Total Scores

Participant	Pre-Survey	Post-Survey	Total	Normalized Value	Normalized Pre-Survey	Differences	Squared	Squared/Normalized Pre-Survey
1	25	33	58	1.004405286	25.11013216	7.889867841	62.25001455	2.479079527
2	33	28	61		33.14537445	- 5.145374449	26.47487822	0.798750313
3	22	22	44		22.0969163	-0.0969163	0.009392769	0.000425071
4	20	27	47		20.08810573	6.911894273	47.77428244	2.378237306
5	23	25	48		23.10132159	1.898678414	3.60497972	0.1560508
6	19	22	41		19.08370044	2.916299559	8.504803121	0.445657966
7	20	23	43		20.08810573	2.911894273	8.479128258	0.422096955
9	26	26	52		26.11453744	- 0.114537445	0.013118826	0.000502357
10	21	24	45		21.09251101	2.907488987	8.453492208	0.40078169
11	28	13	41		28.12334802	- 15.12334802	228.7156553	8.132589872
12	27	25	52		27.11894273	- 2.118942731	4.489918298	0.165563914
13	19	28	47		19.08370044	8.916299559	79.50039783	4.165879573
14	17	15	32		17.07488987	- 2.074889868	4.305167964	0.25213445
15	19	19	38		19.08370044	- 0.083700441	0.007005764	0.000367107
16	22	26	48		22.0969163	3.9030837	15.23406237	0.689420287
17	16	9	25		16.07048458	- 7.070484581	49.99175222	3.110780634
19	26	27	53		26.11453744	0.885462555	0.784043936	0.030023275

20	18	17	35		18.07929515	- 1.079295154	1.16487803	0.064431606
21	30	25	55		30.13215859	-5.13215859	26.3390518	0.874117655
22	23	22	45		23.10132159	- 1.101321586	1.212909236	0.052503889
Total	454	456	910		456	D.F.=19; CV=30.14	$\alpha=0.05$	$\chi^2=24.6193942479352$
Normalized	456	456						

Chi-Squared Comparing Frequency of Themes in Observation Guides between Research Sites

	Engagement	Intergenerational Communication	Learner Controlling Learning	Archaeology	Community Engagement	Total
HMS OG	27	111	68	60	75	341
HCC OG	18	67	37	28	52	202
Total	45	178	105	88	127	543
Normalized Value	0.592375367					
Normalized HMS OG	15.9941349	65.75366569	40.28152493	35.54252199	44.42815249	202
Differences	-2.005865103	-1.246334311	3.281524927	7.542521994	-7.571847507	D.F=4; CV=9.49
Squared	4.02349481	1.553349214	10.76840584	56.88963803	57.33287467	$\alpha=0.05$
Squared/Normalized HMS OG	0.25156064	0.023623766	0.267328654	1.600607803	1.290462724	$\chi^2=3.433583586$

303

***Note: The theme, perceptions of intergenerational teaching/learning, was not included in this chi-squared testing due to the absence of the theme in observation guides and the inability to properly assess this theme without personal input from participants at the History Colorado Center, such as the child participants’ journals and adult participants’ write-ups gathered at the Highlands Micro School site.**