CELEBRATING THE BOND BETWEEN CHILDREN AND NATURE: DESIGNING A SENSORY OUTDOOR LEARNING ENVIRONMENT FOR GARFIELD ELEMENTARY SCHOOL IN AUGUSTA KANSAS

by

CAMMIE CHRISTNER

A REPORT

submitted in partial fulfillment of the requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture/Regional and Community Planning
College of Architecture, Planning and Design

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2013

Approved by:

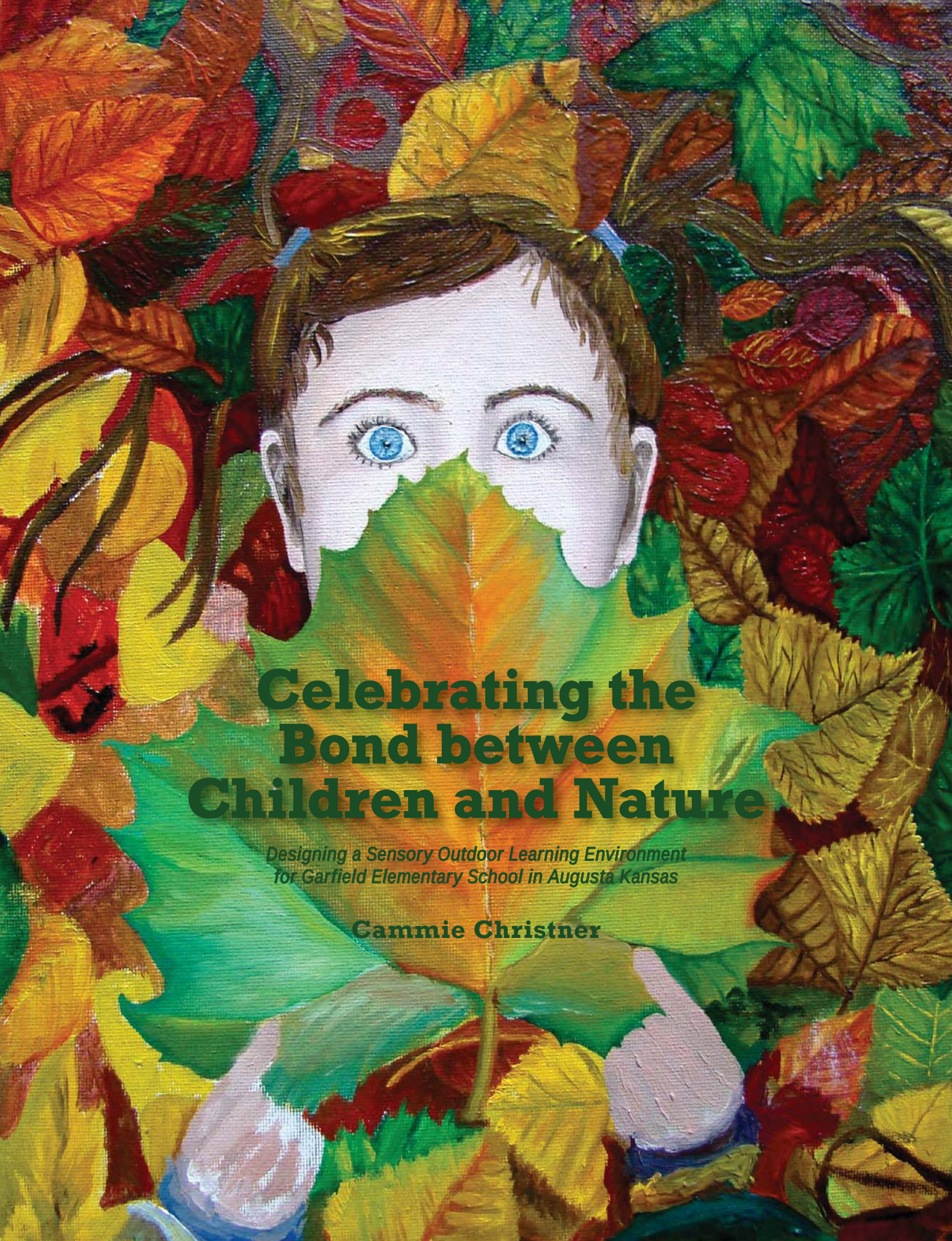
Major Professor
Dr. Anne Beamish

ABSTRACT

The current educational model utilized in the United States focuses on teaching technology, preparing for standardized tests, and training students to be productive members of society. These are all valuable and necessary educational goals, especially considering the fact that the current national trend is to promote citizens' integration into a more global community and job market—significantly affecting the work opportunities available to our country's youths. However, one of the most necessary and fundamental aspects of childhood—outdoor learning in nature—is being undervalued. Outdoor learning experiences in the natural environment are exceptionally important in encouraging holistic childhood development because they offer children firsthand experiences with natural processes. Through interactions with nature, children are able to witness the impact that human actions have upon the environment. As Richard Louv asserts in the Last Child in the Woods, "Healing the broken bond between our young and nature—is in our self-interest, not only because aesthetics or justice demands it, but also because our mental, physical, and spiritual health depends upon it" (Louv, 2008, 3).

The broken relationship between America's youths and nature must be healed. Public schools offer a unique opportunity for children to be reacquainted with nature because about 90% of American students below the college level attend public schools. In the year 2009, over 2.3 million students attended public elementary schools; 226,082 of those students were in Kansas (National Center for Education Statistics, 2012).

Garfield Elementary School in Augusta, Kansas is an ideal situation for the development of an outdoor learning environment that promotes student awareness and connection to local nature. The nature-oriented design of Garfield Elementary School's grounds, described in this Master's Report, fosters the creation of deep-seeded emotional ties to the natural world in the children who experience the site—effectively combating Nature-Deficit Disorder by encouraging students to become environmental stewards. This is accomplished by using children's literature to inspire the organization of spatial environment variety and a range of natural elements (such as water) on the school site, which encourage students to engage in five outdoor learning activities: physical, creative, sensorial, solitary and social.



Celebrating the Bond between Children and Nature

Designing a Sensory Outdoor Learning Environment for Garfield Elementary School in Augusta Kansas

Cammie Christner

Celebrating the Bond between Children & Nature

Designing a Sensory Play Environment for Garfield Elementary School in Augusta Kansas

By Cammie Christner

Submitted in partial fulfillment of the requirements for the degree
Master of Landscape Architecture

Department of Landscape Architecture
College of Architecture, Planning and Design

Kansas State University
Manhattan, Kansas
May 2013
Approved by Major Professor
Dr. Anne Beamish

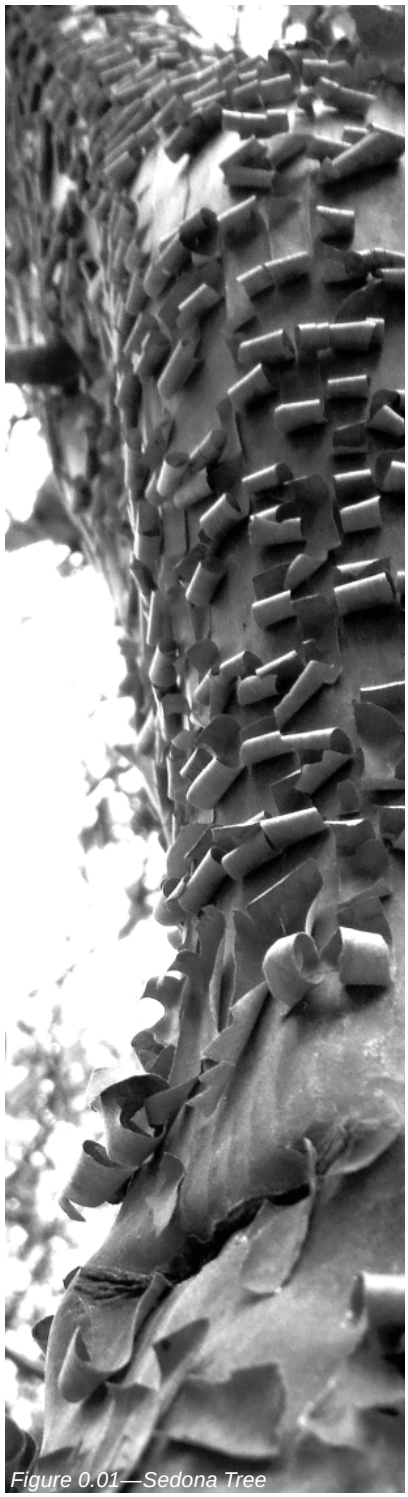


Figure 0.01—Sedona Tree

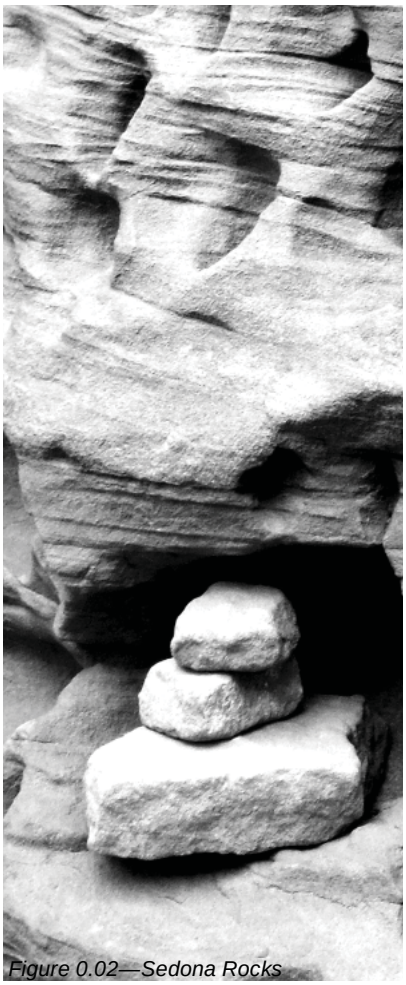


Figure 0.02—Sedona Rocks

Department of Landscape Architecture
College of Architecture, Planning and Design
Kansas State University

Committee Members:
Dr. Anne Beamish
Katie Kingery-Page
Dr. Bronwyn Fees

Dedication

To the teachers, professors, and educators who have the opportunity to positively impact the lives of their students each day. May you inspire children to respect, appreciate, and love the natural world by teaching them the ethics of sustainable land practices. Give students the opportunities to explore nature to which all people are entitled.

I believe in the words of Baba Dioum, a wise naturalist Senegalese poet. He stated the significance of the human-nature bond simply in a speech presented at the International Union for Conservation of Nature in 1968 New Delhi, India:

“In the end, we will protect only what we love.
We will love only what we understand.
We will understand only what we are taught.”

Educators, you have been entrusted with the responsibility of teaching children the significance of the human-nature bond. Share with them this simple truth: that it is the responsibility of all people to strive toward sustainable management of earth’s resources. This environmental stewardship is necessary to ensure the survival of humans, and all other species, on this planet.

Abstract

The current educational model utilized in the United States focuses on teaching technology, preparing for standardized tests, and training students to be productive members of society. These are all valuable and necessary educational goals, especially considering the fact that the current national trend is to promote citizens' integration into a more global community and job market—significantly affecting the work opportunities available to our country's youths. However, one of the most necessary and fundamental aspects of childhood—outdoor learning in nature—is being undervalued. Outdoor learning experiences in the natural environment are exceptionally important in encouraging holistic childhood development because they offer children firsthand experiences with natural processes. Through interactions with nature, children are able to witness the impact that human actions have upon the environment. As Richard Louv asserts in the *Last Child in the Woods*, "Healing the broken bond between our young and nature—is in our self-interest, not only because aesthetics or justice demands it, but also because our mental, physical, and spiritual health depends upon it" (Louv, 2008, 3).

The broken relationship between America's youths and nature must be healed. Public schools offer a unique opportunity for children to be reacquainted with nature because about 90% of American students below the college level attend public schools. In the year 2009, over 2.3 million students attended public elementary schools; 226,082 of those students were in Kansas (National Center for Education Statistics, 2012).

Garfield Elementary School in Augusta, Kansas is an ideal situation for the development of an outdoor learning environment that promotes student awareness and connection to local nature. The nature-oriented design of Garfield Elementary School's grounds, described in this Master's Report, fosters the creation of deep-seeded emotional ties to the natural world in the children who experience the site—effectively combating Nature-Deficit Disorder by encouraging students to become environmental stewards. This is accomplished by using children's literature to inspire the organization of spatial environment variety and a range of natural elements (such as water) on the school site, which encourage students to engage in five outdoor learning activities: physical, creative, sensorial, solitary and social.

Acknowledgements

Thank you, Mom for motivating me to learn more about elementary education and for inspiring me to choose the development of an Outdoor Learning Environment for Garfield Elementary School as my Master's Project. Thank you, Cathy Shaffer and Jennifer Cody for offering your time and efforts to help me conduct the Creative Design Activity with Garfield's Fourth Grade students for this project. I also want to thank all of the Garfield Elementary School teachers who gave me advice in the development of the Outdoor Learning Environment. I want to acknowledge the Augusta community and Unified School District 402 members for allowing my participation in the design of the school grounds.

I want to thank the Augusta Historical Society members for helping me find information on the town's past.

I would like to thank Shauna Schultz of PBA Architects for providing me with the AutoCAD and Revit base information for the newly constructed Garfield Elementary School site; these base files were instrumental in the creation of the design graphics for the Outdoor Learning Environment proposal.

Also, I would like to thank Julie Johnson of Little Tikes Commercial Play Systems (LTCPS) and Bret Russell of Recreation Resource Inc. for providing me with the 3D AutoCAD base files for the Early Childhood/ Kindergarten and First through Fifth Grade stationary play equipment areas. These files aided in the creation of the digital Vue site model and perspective renderings created to express the Outdoor Learning Environment design for Garfield Elementary School.

I want to thank Dr. Anne Beamish for guiding me through this design process, offering me with both design insights and advice that improved my design proposal for the Outdoor Learning Environment, and for proof-reading my writing throughout the design process.

I also want to thank Katie Kingery-Page and Dr. Browyn Fees for providing advice and feedback on this project.

Thank you, Dereatha Cross for teaching me how to create a Vue site model and for troubleshooting technical errors along the way.

I would also like to thank all of the great teachers and college professors who have taught and supported me in my academic endeavors throughout my educational career.

Lastly, I would like to acknowledge my family and friends. Thank you all for supporting me, offering me advice, listening to my ideas, and helping me to be who I am today.

Figure 0.03—Yellow Buckeye

Table of Contents

List of Figures

List of Tables

**All tables are by author unless otherwise noted.*

Introduction

Design Purpose

Many children in developed societies today are disconnected from nature. This disconnect could result in further human damage to the environment if a bond between children and nature is not established. The design project described in this book attempts to address the root of three current societal issues. 1) American society is disconnected from nature. 2) American society is predominated by a proclivity for indoor lifestyles. 3) Traditional American playground design limits children's access to diverse play opportunities (which are actually forms of outdoor learning).

Figure 1.01—Ecological Appreciation
Sailboats at Tuileries in Paris, France

The design of an Outdoor Learning Environment on the Garfield Elementary School grounds in Augusta, Kansas is a small-scale solution that attempts to tackle the above stated issues on the public school's site. My hope is that the design will foster a connection to nature in the school's children, inspiring them to spend more time exploring the outdoor environment and less time indoors—plugged-in to technology. This creative, stimulating, and nature-focused outdoor learning environment could impact the lives of Garfield's children by 1) improving their mental, social, psychological, and physical health, 2) giving them greater understanding of Earth's natural processes, 3) making them aware of the human race's dependence upon nature for sustenance, and 4) generally encouraging them to hold a greater appreciation for the biosphere. These goals are addressed by creating an Outdoor Learning Environment inspired by children's literature, which encourages children to develop physical, cognitive, and emotional ties to the local nature expressed onsite.

To inspire an ecological appreciation in Garfield Elementary School's students is the ultimate goal that I have for this design project. Ultimately, the Outdoor Learning Environment design could act as a catalyst for similar renovations to take place in school grounds across the country. This outcome is dependent upon school staff, designers, and parents' affirmation of the design principles that form the foundation for the school's site design.

A Societal Disconnect from Nature and its Implications

A majority of American development that has occurred since the Industrial Revolution has not focused on the sustainable utilization of the country's natural resources. Sustainable, in this case, means "meeting the needs of present generations without jeopardizing the ability of future generations to meet their own needs by utilizing natural resources at rates that can be replenished" (European Commission, 2012). Such a lack in sustainable design efforts has resulted in humans becoming disconnected from nature. Industrialized man has distanced himself from the natural processes occurring throughout the Earth but not from reliance upon these resources and natural processes for survival. This disconnect is a problem because it has lead to the over-expenditure of Earth's natural capital—which could prove to be detrimental to the survival of the human race as well as other biotic species. Increases in waste production and CO^2 emissions are being produced at rates that cannot be naturally absorbed into the Earth's ecosystems. Also, humans are depleting the Earth's natural resources in a way that it damages those resources beyond repair. All of this is leading to global warming and other detrimental environmental changes that could catastrophically affect all species present on the earth—including humans. Therefore, it is important that we people form a relationship with natural resources that is not reducing the health and availability of such resources for future generations. Aldo Leopold states in his novel *A Sand County Almanac*, "Like winds and sunsets, wild things were taken for granted until progress began to do away with them. Now we face the question whether a still higher 'standard of living' is worth its cost in things natural, wild, and free" (Leopold, 1966, xvii).

American society is obsessed with materiality and consumption—pushing concern for nature to the wayside. However, our survival is intimately tied to the health of the natural world and it has become necessary that a land ethic be taught to American citizens, especially to children. "Of all the causes that attract the attention of these young people, the plight of nature is one which may be truly a last call. Things wild and free are being destroyed by the impersonality of our attitude toward the land. What better way to fight the destruction of nature than to place in the hands of the young this powerful plea for a land ethic?" (Leopold, 1966, xv). Land ethic, which is a concern for the health of Earth's ecosystems and the natural processes and biotic life forms that comprise them, must be taught in order to ensure that people act as environmental stewards. Therefore, the people of the United States of America must make decisions and enact policies that will maintain, not compromise, the health of our country's ecosystems.

The Predominance of the Indoor Society

The lifestyles of Americans foster the creation of an indoor-based society. One of the primary effects of such a society is that Americans are increasing the amount of time dedicated to sedentary activities, while decreasing physical activity levels.This not only increases obesity, but also creates a separation between people and the natural environment. But what is the culprit of this proclivity for staying indoors? A multitude of factors could be attributed, ranging from technological advances in virtual entertainment to increasing urban population numbers to the rising numbers of single-parent homes or homes with both parents working. All of these factors and more have resulted in the human disconnect from nature—which particularly impacts the youths of our nation. Children develop habits that reflect the environments in which they are raised. If children are raised in an indoor society, then how will they feel connected to nature or develop concern for the environment—something with which they have no personal relationship?

Whatever the specific causes of the indoor society are, the outcome is the same—Nature-Deficit Disorder. Richard Louv defines this childhood disconnect from nature as Nature-Deficit Disorder. “Nature-Deficit Disorder refers to the increasing divide between the young and the natural world, and the environmental, social, psychological, and spiritual implications of that change” (Louv, 2008, p. 2). Children are of particular concern because they are experiencing childhood—as well as the developmental learning that this earliest stage of life encompasses—in indoor environments. “As the young spend less and less of their lives in natural surroundings, their senses narrow, physiologically and psychologically, and this reduces the richness of human experience” (Louv, 2008, 3). Children’s lack of both access and exposure to nature is not acceptable; it reduces the richness of human experience available to them during their transition from childhood to adulthood. Resisting this move towards an indoor civilization must become a priority for the designers, educators, and parents who are responsible for the needs of the child. Only when children are given access to the outdoor learning environments and exposure to nature necessary for healthy development, will Nature-Deficit Disorder be remediated.

Traditional Design Limits Play Opportunities

The concern for safety in America's playgrounds has led to a drastic reduction in playground design creativity, resulting in sterile play environments that only promote indoor activity. Also, the notion that traditional playgrounds are safer than designed, creative, or well-managed adventure playgrounds is misguided; a poorly designed traditional playground can be more hazardous than a well-designed creative playground. "Despite their poor safety record and their failure to allow children to exercise fully their creativity and spontaneity as part of the process of play, traditional playgrounds predominate" (Brett et al., 1993, 11). Traditional playgrounds do not promote the developmental benefits that accompany creative play, but rather make the misguided assertion that the sterilization of playgrounds increases safety. Policy-makers, then, have the responsibility of selecting public playground designs that both promote safety and stimulate developmental learning.

Playground design is dependent upon adults making decisions regarding the health, safety, and developmental needs of children. The current trend is for these decision-makers to stamp "cookie-cutter" playgrounds on public school and park sites that have playground equipment approved by the Consumer Product Safety Commission (CPSC) and Kansas Department of Health and Environment (KDHE). Such un-planned play areas limit creativity and thereby devalue the activity of children's play. "This backward view of what constitutes a good developmentally-oriented playground is the result of both ignorance and a tendency to devalue the importance of children's play on the part of public officials" (Brett et al., 1993, 11). Safety does not need to limit play opportunities. Designing multi-faceted playgrounds that offer a variety of play areas can meet required safety standards, while also offering children the play areas needed to stimulate cognitive, social, and physical development. Such multi-faceted play areas can be thought of as outdoor learning environments because of the potential that they offer students to stimulate diversified forms of learning.

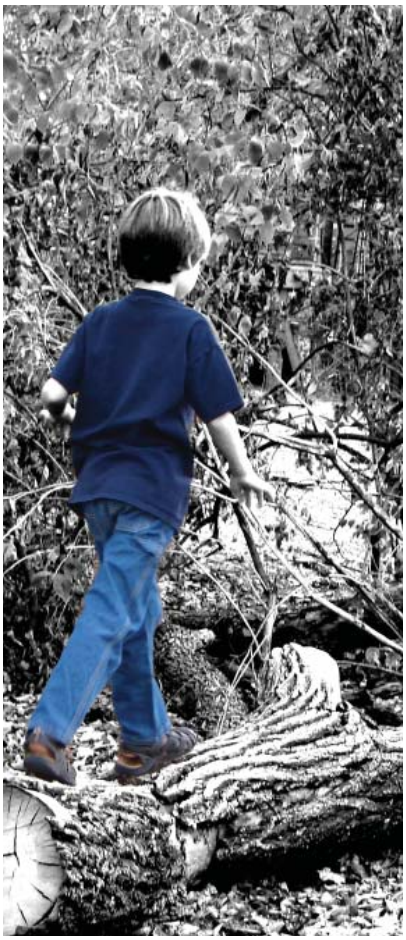


Figure 1.02—The Child-Nature Bond
Child walking on log in Topeka, KS

Potential to Enact Change

A possible far-reaching effect of encouraging the relationship between nature and children (first in the Outdoor Learning Environment at Garfield Elementary School and then in other primary school grounds across the country) includes the development of an ecological conscience in American society. Childhood appreciation, respect, and ultimately care for nature could develop with the encouragement of diverse nature-focused spatial environments on school grounds. The strength of this initial bond would ensure its endurance into adulthood, resulting in ecologically conscious adults. These adults who first bonded with nature on the grounds of public elementary schools—could then promote environmental health by voting to pass policies that endorse conservation and resource management of America's lands. By teaching people to respect and understanding nature through initial physical experiences of outdoor learning environments, they will love and ultimately protect nature, its species, and its resources.

Project Development

The *Research Question*, *Thesis Statement*, and *Project Limitations Statement* defined in the Research Proposal for this project acted as guiding influences in both the background research and design development for creating an Outdoor Learning Environment at Garfield Elementary School in Augusta Kansas.

Research Question

How can the outdoor spaces of the Garfield Elementary School site be designed to build or strengthen the bond between nature and children?

Thesis

The nature-oriented design of Garfield Elementary School's outdoor space in Augusta, Kansas will commemorate and celebrate the human bond with nature, fostering deep-seeded emotional ties to the natural world in the children who experience the site—effectively combating Nature Deficit Disorder by educating students to become more aware of environmental stewardship.

Project Limitations

The human connection with nature in general is too broad a topic to be researched, analyzed, and synthesized within the time frame of a six month master's project. Indeed, it may be too broad a topic to gain full understanding of in a lifetime. Therefore, the goal of this master's project is to explore ways to design a school's outdoor spaces in order to enrich the student learning environment and ultimately strengthen students' bond with nature. (The specific site being studied is Garfield Elementary School in Augusta Kansas.) By focusing on this small scale of developing the human-nature bond, the goal of establishing site design ideals that will commemorate the human relationship with nature and generate in children a deep-seeded bond and appreciation for the biophysical world and its species becomes more attainable. My goals for this project are: 1) to determine how the child-nature bond can be applied to physical form in order to develop a set of design guidelines, and 2) to apply these guidelines to the site of Garfield Elementary School.

I. The Benefits of Natural Play

“For I'd rather be thy child

And pupil, in the forest wild,

Than be the king of men elsewhere,

And most sovereign slave of care;

To have one moment of thy dawn,

Than share the city's year forlorn.”

—Henry David Thoreau’s poem “Nature” from his “Poems of Nature” collection first published in 1895

What is Nature?

Figure 2.01—Walking into Nature
Sketch of a boy on a log in Topeka, KS

Figure 2.02—A Path through Nature
La Rupe in Orvieto, Italy

What is Nature?

One of the most fundamental questions of this project is: What do we mean by "Nature"? Nature, when describing the physical environment, is a term too often generalized. The definition of nature from *Merriam Webster* is "the external world in its entirety" (Nature, 2008) and *Merriam Webster's Student Dictionary* defines nature as "the physical universe" or "natural scenery" (Nature, 2007). Even *The Free Online Dictionary, Thesaurus, and Encyclopedia* gives overly simple descriptions of the term nature including: "the material world and its phenomena;" "the forces and processes that produce and control all the phenomena of the material world;" "the world of living things and the outdoors;" and "a primitive state of existence, untouched and uninfluenced by civilization or artificiality" (Free, 2012). And although *Oxford Dictionaries'* has provided the most thoughtful definition of the word nature, it also remains unsettlingly indistinct. *Oxford Dictionaries* define the word nature as "the phenomena of the physical world collectively, including plants, animals, the landscape, and other features and products of the earth, as opposed to humans or human creations" (Oxford, 2012). But do any of these definitions really offer people a clear, distinctive description of what is nature?

For the purposes of this project, the term nature cannot be all-encompassing. Nature must be described in specifics that will make it possible to both design and implement "naturalized areas" in outdoor learning environments. The reason for specificity is that nature is difficult to qualify otherwise. For example, how does one design nature into a place if it is generalized? Is nature one rock or five? Does the rock need to be a certain size to be considered nature? Is a designed landscape as much a part of nature as is the Grand Canyon Canyon—a part of the natural world that is not designed by humans. In simplest terms, current definitions of the word "nature" leave designers with uncertainties, which can hinder designers' ability to include and promote nature in projects. Therefore, I have drawn from the elements of nature described by various naturalist authors such as Walt Whitman, Ralph Waldo Emerson, and Aldo Leopold in order to create specific definitions of "nature" for the purposes of this project. These definitions express the meaning of the word "nature" in its usage regarding the development of Garfield's outdoor learning environment.

Nature includes tactile elements such as water, sand, mud, soil, rocks, and flora, fauna, and avifauna species. But what quantities of these are needed (size and amount) to allow for children to truly experience the natural environment? I have created a specific description of each element and the criteria that it must fulfill to be considered "nature" in the following list. Atmospheric elements such as air, clouds, wind, precipitation, and light (from the sun, moon, and stars) are also "nature" and are emphasized Outdoor Learning Environment site design at Garfield Elementary School.

Figure 2.03—Water
Blue Water in Capri, Italy

Water

Merriam Webster defines water as “the liquid that descends from the clouds as rain, forms streams, lakes, and seas, and is a major constituent of all living matter” (Merriam Webster, 2008). I have defined water as nature if it is a body of water such as a pond, stream, or river and has native or naturalized plant species around at least 50% of the water body’s edges. Also, the plants must continue for a distance of at least two feet from the water body’s edge (measured perpendicularly). These plant species may be trimmed to a height no lower than eight inches from the ground. Only sand, mud, gravel, crushed concrete or other recycled hardscape materials are suitable natural edge material for water bodies. A puddle/pond may be considered nature if it fits the surrounding plant species requirements, has a diameter of at least two feet, and reaches a depth of at least three inches.

Figure 2.04—Sand
Sandy Beach at South Padre, TX

Sand

Merriam Webster (2008) defines sand as “a loose granular material that results from the disintegration of rocks, consists of particles smaller than gravel but coarser than silt, and is used in mortar, glass, abrasives, and foundry molds.” I have defined sand as nature if it is greater than three feet in diameter and extends for a depth of at least six inches. The sand may be either fine or coarse.

Figure 2.05—Mud
Mud at Marlatt Park in Manhattan, KS

Mud

Merriam Webster (2008) defines mud as “a slimy sticky mixture of solid material, such as soil and other organic matter, with a liquid, especially water.” I have defined mud as nature if it is pliable enough for children to pick it up from the ground to play with. It must occur in an area of at least two square feet and to a depth of at least one inch.

Soil

The Natural Resources Conservation Service (2012) defines soil as "the unconsolidated mineral or organic material on the immediate surface of the Earth that serves as a natural medium for the growth of land plants." I have defined soil as nature if it is 1) supporting plant life or 2) covering an area of at least two square feet, enabling children to interact with the material. The soil must not have a hardscape covering such as concrete. Mud and sand are different types of soil.

Figure 2.06—Soil
Topsoil at Garfield School in Augusta, KS

Rock

Merriam Webster (2008) defines rock as "a mass of consolidated or unconsolidated solid mineral matter." I have defined rock as nature if it occurs in a mass of at least one cubic foot and occupies a two square feet area or more. It is recommended that rock be consist of a localized material, such as limestone to emphasize the native qualities of the region. Also, rock material must be hard enough to break the lead of a #2 pencil.

Figure 2.07—Rocks
Limestone capstones in Topeka, KS

Flora

Merriam Webster (2008) defines flora as "plant life or as the plants characteristic of a region, period, or special environment." I have defined flora as nature if it consists of trees, shrubs, grasses, accent plants, flowers, and any other vegetative material that utilizes photosynthesis to convert sunlight into energy. Flora species that are native to the region have preference over non-native plants. Plants that are naturalized but not invasive will have second preference. Turf areas are not considered to be nature. For vegetation to be considered "nature," there must be at least two native or naturalized plant species present and they must occupy a two square foot area minimum. It is recommended that the plant species be of varying heights (at least a four to six inches difference) with the shortest plants in front. This plant organization emphasizes the informal and "natural" qualities of the space.

Figure 2.08—Flora
Flowers in Manhattan, KS

Figure 2.09—Fauna
Monarch Butterfly in Manhattan, KS

Fauna

Merriam Webster (2008) defines fauna as “animal life or as the animals characteristic of a region, period, or special environment.” I have defined fauna as nature by including all animals native to the region: insects, spiders, amphibians, reptiles, and mammals. Incorporating plants to create habitats for specific types of insects like butterflies or small mammals such as ground squirrels is the vehicle that is utilized to encourage fauna to occupy the school site.

Figure 2.10—Avifauna
Yellow Rumped Warbler in Lenexa, KS

Avifauna

Merriam Webster (2008) defines avifauna as “the birds or the kinds of birds of a region, period, or environment.” I have defined avifauna as nature by including all bird species native to the region. Once again, utilizing plants to create habitats that will encourage specific bird species to occupy the site is the means for presenting Garfield students with the opportunity to see avifauna at the school grounds.

Including Elements of Nature

The specific definitions of each natural element listed above represent the requirements that must be met for an element to qualify as “nature.” Minimum quantities of each element are listed in order to ensure that Garfield students are offered clear, obvious examples of nature. These larger illustrations of “nature” make it easier for children to distinguish and retain knowledge about each natural element that they encounter.

These natural elements can be incorporated in an exterior landscape to highlight the sensorial qualities, topographical features, and climatic conditions present onsite. The sensorial qualities of a space include sight, sound, touch, smell, and taste. Taste is probably the most difficult sense to include within a school environment because of the maintenance issues associated with growing produce or fruits. For example, trees that produce large fruits such as apples could prove to be bothersome for maintenance staff. However, shrubs that produce edible fruit such as service berry shrubs are implementable due to the lessened potential litter. Other senses can be easily accommodated within the outdoor learning environment. Informed planting design and the incorporation of elevation changes can persuade children to utilize and develop their senses: sight, sound, touch, and smell. To celebrate local nature even more, the outdoor learning environment should also emphasize existing topography and climatic conditions like wind or rain. Through such incorporation of sensorial design elements that commemorate local nature, children can be encouraged to interact with the local natural environment.

Children Need Play in Nature

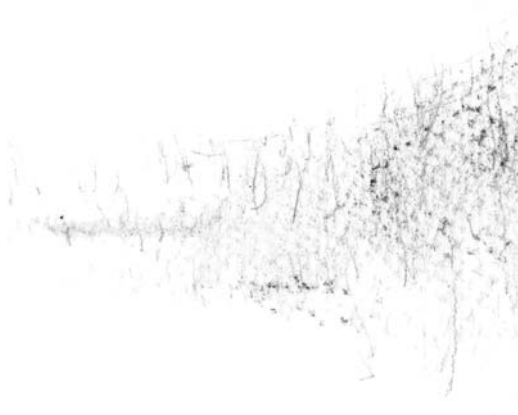


Figure 2.11—Children Need Play in Nature
A hill slide offers children the opportunity to have fun in nature.

Children Need Play

A majority of American children do not have meaningful experiences with nature. Rather, they are involved in technology—video games, television, and other sedentary activities. This lack of outdoor play may seem harmless; however, the effects are far-reaching—from a rise obesity rates to an increasing number of children who have attention problems. “There is a growing epidemic of child and adult obesity in America. With obesity comes the onslaught of Type 2 diabetes and other diseases that can financially strain our health care system” (Frost et al., 2004, 6). The growing number of American children that are experiencing adverse health is a result of adults’ tendency to undervalue outdoor play. “Although play is probably not essential for children to develop various cognitive, social, and emotional skills and abilities, the research clearly indicates that play can facilitate healthy development. Play may even provide the best context in which children grow and learn” (Rogers, 1988, 71).

Play is Learning

Play is often viewed as a superfluous activity with one fundamental purpose—to provide children with the opportunity to expend pent-up energy. This belief even pervades the school system—a realm dedicated to student learning and achievement. As a result, a large number of current educators see play only as a means to “wear-out” children in order to promote better classroom behaviors. However, the belief that play is unimportant to child development is both inaccurate and outdated. “Play is valuable because it is tied to the development of behaviors highly valued in children: cognitive, social, and emotional. However, we should value play not just for its indirect stimulation of cognitive skills and problem solving, but because play is the main feature of what it means to be human (Vandenberg, 1985)” (Rogers, 1988, 56).

A growing number of psychologists and educators are realizing that play not only encourages physical development, but is instrumental in promoting children’s preparation for society. Cosby S. Rogers and Janet K. Sawyers, both professors of child development at Virginia Polytechnic Institute and State University, in their book *Play in the Lives of Children* make the assertion that “As an intrinsically motivated behavior, play may be the most important process through which children learn to adapt to the world and become more mature” (1988, 2). These two authors go on to say that “Children are intrinsically motivated to learn through play” (Rogers, 1988, 114). Children are engaged in outdoor learning through playful interactions with the natural environment.

Forms of Play

Jean Piaget, a Swiss psychologist, asserted that play is a complex learning activity that is integral in promoting holistic child development and preparation for society. “Piaget first cited the theoretical link between play and social functioning; he believed that children are intrinsically motivated to engage in social interactions. Through play children move beyond their own egocentricity and expand their knowledge of the social world” (Rogers, 1988, 64). Types of play activities that he describes include: parallel activity, solitary independent play, associative play, and cooperative or organized play. Parallel play is where children observe and mirror the play activities of other children nearby, without actually interacting with them. Solitary or independent play is where a child plays alone. Associative play is where “common activities occur between children without specific roles or orgainzed goals” (Rogers, 1988, 21). Cooperative play occurs when children role-play and socially interact with one another. The variety of play forms speaks to both the activity’s complexity and its potential to motivate student learning.

Each of these classifications of play is associated with a different level of complexity and, therefore, fosters the development of new skill sets as children engage in different learning activities. For example associative play and solitary play are more complex than parallel activity, which is the play activity primarily selected by younger children. Cooperative play is the highest level of play activity, encouraging children to conduct the complex role-playing activities that provide the foundation for societal interactions in adulthood. Both social skills and social cognition are improved through play. Social skills are “children’s ability to manage the environment through cooperation, helping, sharing, and successful social problem-solving” (Rogers, 1988, 64). Social cognition is “children’s ability to think about their social world (Rubin, 1980)” (Rogers, 1988, 64).

Sara Smilansky, a developmental psychologist, also promotes play as a cognitive and social development activity for children. She lists four stages of play that increase in complexity: functional play, constructive play, dramatic or symbolic play, and games with rules (Rogers, 1988, 64). As children grow and develop, they engage in increasingly complex forms of play. Younger children use functional play, which is characterized by repetitive actions and interaction with loose parts[1] such as sand or water, to develop basic motor skills. Children then engage in constructive play where they focus on building—which promotes cognitive development as children experiment with the interactions between different materials. Dramatic play is yet a higher

[1]*“Loose parts are materials that can be moved, carried, combined, redesigned, lined up, and taken apart and put back together in multiple ways” Penn State Extension. (2013). Loose Parts: What does this mean? The Basics for Caring for Children in Your Home. Retrieved from http://betterkidcare.psu.edu/TIPS/tips1107.pdf*

level of activity complexity, encouraging role-playing like Jean Piaget's classification of cooperative play. Games with rules also prepare children for society as they must follow rules and the goal of winning defines the purpose of the game. This play differs from other forms of play that are more open-ended and have no desired outcome. As they age, children typically transition from functional play activities to more complex forms of play, such as games with rules. However, children retain all forms of play in their repertoire of outdoor activity, encouraging the continuation of learning and holistic development.

The cognitive stimulation and multi-faceted developmental benefits provided by play must be recognized by adults in charge of student learning in order to ensure that children have opportunities for this invaluable learning activity. "Even though play is enjoyable, it is a crucial part of real learning. The value of play needs to be emphasized because of the American culture's failure to recognize the very important role it has in the process of education and learning" (Brett et al., 1993, 3). In fact, play is probably the most instrumental activity that contributes to physical, social, and intellectual human development. As Carles Broto states in *The Complete Book of Playground Design*, play is beneficial to children because it allows them to engage in a multitude of activities that encourage the utilization of a variety of skills.

"Not only do children release energy and develop motor skills, balance, and coordination through play, but they also forge their personalities through social activities while stimulating creativity, the capacity to reason and language skills. Through play, children create custom-made realities and experiences. They learn to resolve problematic situations, confront new challenges and set their sights on new goals, all of which formats their capacity to organize, plan, and make decisions. Play activities, therefore, are invaluable "dress rehearsals" for their future lives" (Broto, 2012, 37).

Figure 2.12—Unstructured Play
Child running freely at the Children's Discovery Center in Topeka, KS

Unstructured Play

Unstructured or free play offers children the ability to be creative; it allows them to determine the play activities that are important to their development. "(Free) play is associate with an understanding of self—a necessity if children are to express themselves. Play provides children with the opportunity to examine themselves and their relationship to the environment in a comfortable way and at a self-paced rate. Through play, children feel able to control their world and their feelings" (Rogers, 1988, 69). Providing the opportunity for free play in playgrounds can to counteract the negative effects of America's indoor-focused society. Free play in a natural setting can offer a range of health benefits, including the improvement of physical fitness in children. "Free play is an excellent means of caloric burn and may even increase our children's metabolic rate, fitness, and overall health" (Frost et al., 2004, 6). However, physical fitness is just one area of health that free play can impact. Other developmental benefits of unstructured play include mental, psychological, and social health.

The Complete Playground, written by Arlene Brett, Robin C. Moore, and Eugene F. Provenzo Jr. asserts that children learn to think abstractly through play, which helps them prepare for the adult world.

"Play enhances cognitive, affective, and psychomotor development. Cognitive development includes language, symbolism, mathematical relationships, and scientific principles. Affective development includes social skills such as sharing, assuming responsibility, and cooperating, as well as experiencing emotions such as pleasure and handling strong feelings such as anger. Psychomotor development includes both large and small motor development and coordination. Play helps a child to become a fully functioning person by integrating all aspects of development" (Brett et al., 1993, 3).

Figure 2.13—A Sound Learning Environment
Parents and children learn together in the outdoor music room at the Children's Discovery Center in Topeka, KS.

Play as Preparation for Society

Play is a child's way of making sense of society, nature, and the interactions that they observe in life. Through play, children are offered the opportunity to formulate and express creative thought—something that lessons in a classroom cannot simulate. Furthermore, play encourages children to explore and experiment with their observations of life and society in a non-judgmental setting—which inspires greater play creativity. As described by the Canada Mortgage and Housing Corporation in its book *Play Opportunities for School-Age Children: 6-14 Years of Age*,

"Play is not merely the passing of time; play is life. It is instinctive, voluntary, spontaneous, natural, and exploratory. It is expression. Play combines actions and thoughts. It gives satisfaction and a feeling of achievement. Through play children develop physically, socially, creatively, emotionally, and mentally. Play is, therefore, a way for children to learn to live" (Canada Mortgage and Housing Corporation, 1976, 6).

Play, then, can be deemed important, even necessary, to the growth and development of America's youths. Physical, social, mental, and psychological health are all enhanced as a result of play's multi-faceted developmental benefits. "Playing comes naturally; it forms part of children's daily activities and contributes to their physical, mental, and emotional growth from the very start" (Broto, 2012, 37).

Fostering Environmental Stewardship

Long-term impacts of play in nature could result in children's development and acceptance of environmental stewardship ideals that last into their adult lives—which could ultimately influence them to make conversationalist decisions that preserve environmental health. Louise Chawla, in her journal article *Childhood Experiences Associated with Care for the Natural World: A Theoretical Framework for Empirical Results*, supports this claim: "When people who work to protect the environment or educate others about it are asked the reasons for their commitment, they give two answers more often than any others: 1) special places in nature (that they emotionally connected to in childhood) and 2) role models who showed the value of the natural world through their own appreciative attention to it," (2007, 145). This research supports the claim that meaningful childhood experiences in nature can significantly impact students' lives, improving the environment through the creation of an ecological conscience. "What children find in the natural world rewards their initiatives and encourages their continuing engagement, for nature is particularly rich in responsive affordances[2]. It provides all the conditions for events that hold children's attention. Children see immediate, reinforcing effects of their actions, which simultaneously show them how the world works and their own capabilities" (Chawla, 2007, 153). Chawla's research also supports the public elementary school environment as an ideal setting for fostering widespread development of this initial human-nature bond because school grounds are accessible to all students. Moreover, teachers can be trained to serve as these childhood role models who motivate student connection to the outdoors and sustainable environment practices.

[2]*"Affordances are functionally significant properties of the environment which are defined by the relationship between the environment and an organism. For example, a tree affords climbing for a child only if its lower branches reach down to a child's grasp" Chawla, L. (2007). Childhood Experiences Associated with Care for the Natural World: A Theoretical Framework for Empirical Results. Children, Youth and Environments, 17(4). Retrieved from http://www.jstor.org/stable/10.7721/chilyoutenvi.17.4.0144 .*

Figure 2.14—Fostering Environmental Stewardship
Play in nature could result in children's development and acceptance of environmental stewardship ideals that last into their adult lives

Implications of Play Variety

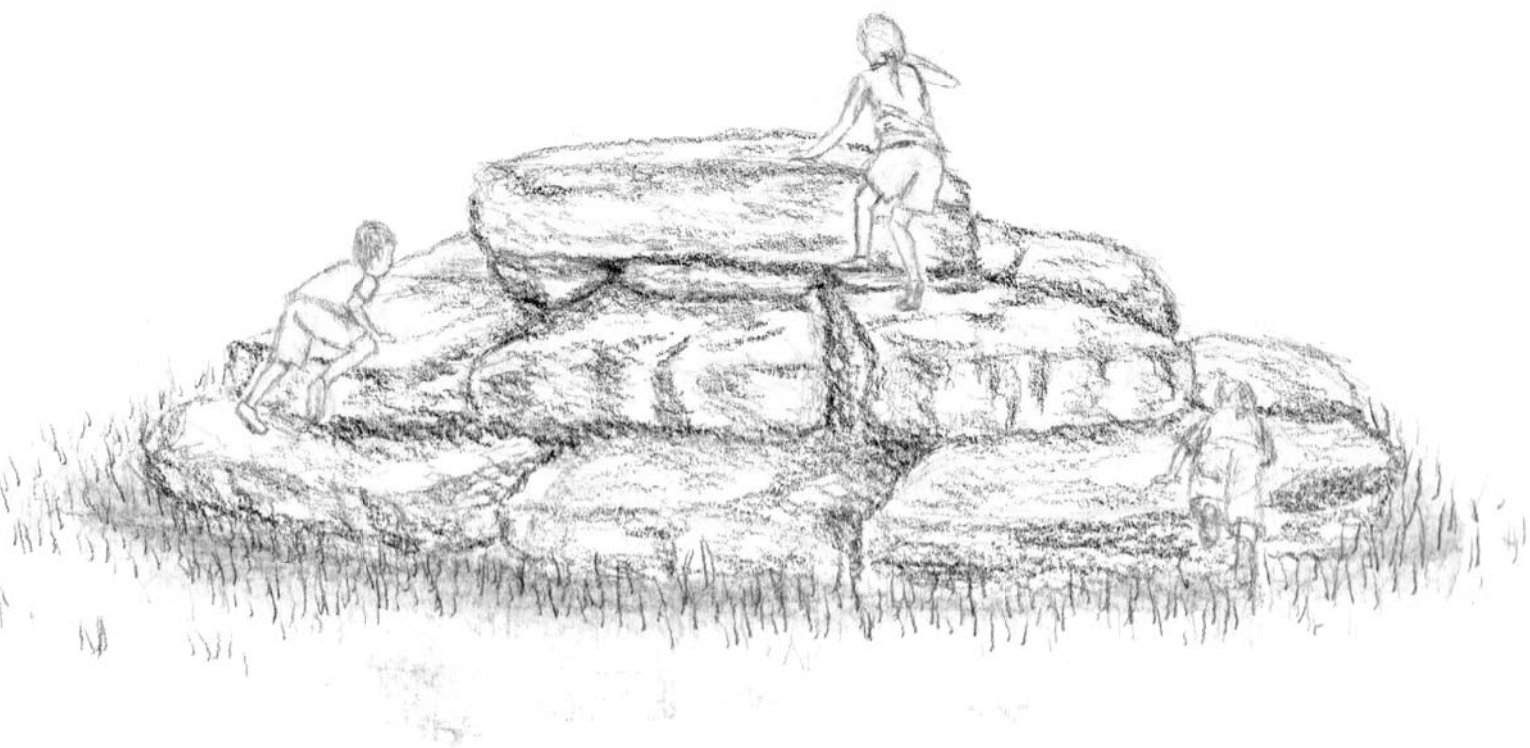


Figure 2.15—Incorporating Play Variety
Natural materials inspire play variety

Figure 2.16—Play Diversity Stimulates Holistic Development
A range of diverse play opportunities augments positive interactions with nature at the Children's Discovery Center in Topeka, KS.

Accommodating for Play Variety

Children develop holistically when they have access to a range of play environments that accommodate a variety of activities. “Kids enjoy variety in their playground equipment and spaces; that is the opportunity to play any number of games or activities. To avoid boredom, the play equipment should be attractive and suitable for each age group and for different levels of activity. It should also provide diverse stimuli for promoting a child’s development—equipment designed to encourage social skills, integration with others, and respect for the environment” (Broto, 2012, 8). Types of play activities that should be accounted for within a playground include physical games, social games, creative games, sensorial games, and peaceful/solitary play. Of these play types, creative games, sensorial games, and peaceful/solitary play will probably prove to be the types of play whose designated play areas will be most successful in promoting the development of a child-nature bond through the inclusion of natural elements in their designs. Also, it is important to note that different age groups of children prefer different types of play.

Figure 2.17—Physical Activity
Parc de la Villette in Paris, France

Physical

Physical games offer children the ability to test athleticism and coordination. “Highly physical play activities, such as jumping, running, cycling, crawling, climbing, or sliding often require nothing more than a good space equipped with adequate protection against bumps and falls. Nonetheless, it is always advisable to ensure some form of modular play equipment, structures and varied terrain, all of which provides a range of possibilities for interaction and dynamic games” (Broto, 2012, 7). Physical forms of play should be encouraged within playgrounds in order to combat the increasing levels of childhood obesity in America and because children may not have opportunities to engage in outdoor games at home.

Figure 2.18—Creative Activity
Snow by il Duomo in Orvieto, Italy

Creative

Creative games allow children to think abstractly, which promotes cognitive development. “Material which can be molded or transformed such as sand, grass, water, gravel, or clay is used in this type of play. It’s hard for a child to keep still when presented with these materials; the physical properties of such elements enable children to develop a wide variety of activities in which the imagination and creativity are of prime importance-qualities of which the smallest children are true masters!” (Broto, 2012, 7). Creative play should not be undervalued as a form of play; it promotes the capacity for wonder by encouraging children to analyze available play materials. Young children, especially, should be given access to the malleable materials that inspire creative play as they are very interested in studying the textures of different materials.

Figure 2.19—Sensorial Activity
Boy smelling flowers

Sensorial

Sensorial games encourage play that utilizes all of the body’s senses—sight, sound, taste, touch, and smell. “Although the senses are involved in all human activity, children are the true pioneers in experimenting with them, which is why those play elements that necessarily involve sensorial experience are especially recommendable. In addition to elements designed for stimulating the sense of touch, auditory, visual, and even olfactory stimuli can be incorporated” (Broto, 2012, 7). Sensorial play promotes a deeper connection to the play environment by making children more aware of their surroundings.

Solitary

Peaceful or solitary play is more reflective, encouraging introspective thought in children. "Providing opportunities for rest and reflection in a playground is just as important as encouraging physical activity. A child's choice to play alone, quietly, should therefore be respected. In order to create the appropriate environment for achieving this, one or various spaces should be set aside and shielded from the noise and activity of the other play areas. In so doing, we provide a setting where children can concentrate on their activity free from outside interference or distractions" (Broto, 2012, 7). Peaceful play is important to incorporate because it can teach children to be entertained by interacting with the environment and they learn that it is not always necessary to play with others.

Figure 2.20—Solitary Activity
Child on tire swings in Topeka, KS

Social

Social games offer children the ability to engage in a high level of interaction with one another—which helps them develop social skills that will carry-on into their adult lives. "Social or relational games are those that involve chasing, hiding and role-playing in groups; imagination is the primary tool used in such activities. Since only very basic means are required to stimulate the imagination, it is more effective to provide abstract, suggestive elements which the children will adapt in their own way" (Broto, 2012, 7). Social games are especially important to accommodate for within public elementary school sites because children are able to interact with a more diverse range of playmates than is available to them in the home environment.

Figure 2.21—Social Activity
Children role-playing in Tuscany, Italy

Outdoor Learning Environments

Figure 2.22—Outdoor Learning Opportunities
Sketch of children climbing a Sycamore tree

Figure 2.23—The Wonders of Nature
Fascination with the outdoors at the Children's Discovery Center Topeka, KS

Implications for Playgrounds

Children must have access to spaces designated for a variety of play activities—playgrounds. A child's access to stimulating play areas is essential to encouraging the fundamental activity of play to take place. If the play environments provided in urban neighborhoods are sterile, then sedentary forms of entertainment such as television and video games will win out in the battle for children's attention. Richard Louv describes his vision of playgrounds in his book *Last Child in the Woods.* "Together, children and adults build their own universe in a domain (playgrounds) where the formal rules of home and school are suspended, where new imaginary worlds can be created. The experience should be so enjoyable that it far out-competes TV and so stimulating that adult volunteers cannot resist devoting their time and energy to it" (128). Playgrounds must be places that encourage play and offer incentives for children to leave their habitual indoor pastimes. Play areas that offer exposure to nature can supply the spatial interest and variety required to provide children with stimulating play environments.

A playground that provides for the variety of play activities needed to promote a child's holistic development while also incorporating natural elements into its design can be considered to be the holy grail of playgrounds. Nature excites the senses and offers children a place to feel free, uninhibited, a place to explore and make discoveries. "In nature, a child finds freedom, fantasy, and privacy: a place distant from the adult world, a separate peace" (Louv, 2008, 7). When in a natural place, children feel a sense of peace and calm wash over them, while at the same time experiencing a heightened sense of excitement. The senses become more attuned, more alive in nature. "Most of all, nature is reflected in our capacity for wonder. Though we often see ourselves as separate from nature, humans are also a part of that wildness" (Louv, 2008, 9).

Access to Nature

Play environments that offer children the ability to interact with the natural environment are vital to the establishment of a bond between children and nature. "Whatever shape nature takes, it offers each child an older, larger world separate from parents. Unlike television, nature does not steal time; it amplifies it" (Louv, 2008, 7). This relationship with nature motivates youths to care about the health of the biosphere that humanity relies upon for survival. Aldo Leopold asserts in his novel *A Sand County Almanac* that connection to the land is fundamental to the establishment of a land ethic. "It is inconceivable to me that an ethical relation to land can exist without love, respect, and admiration

for land, and a high regard for its value" (Leopold, 1966, 261). Children must be given opportunities to connect with the ecological environment in order to develop a bond with nature. The ultimate goal is that this bond will create a sense of land ethic that will inspire children to act as environmental stewards in adulthood.

Children need both exposure to nature and play in order to develop properly. Through the provision of both of these fundamental ideals in a playground design, a stimulating play and learning environment can be constructed. Youths who have access to such play environments will be given the opportunity to experience a playground design that encourages holistic development. Also, the creation of a land ethic will be supported in playgrounds that encourage children to form a bond with the natural environment—promoting the role that land stewardship will play in their adult lives.

Outdoor Learning Environment Examples

Many examples of innovative playgrounds exist throughout the world today. From themed playgrounds to nature-focused playgrounds, to imaginative playgrounds, the range of possibilities for playground design is endless. In the playground examples that I have analyzed, there have been several reoccurring elements. Small moguls, climbing structures, and the implementation of natural or recycled materials are some of these common play features. Many playgrounds utilize the site's natural topography to guide spatial design. For example, slides built into hills can emphasize the human relationship to place. The usage of a variety of ground materials and the incorporation of path systems are also common program elements in playgrounds. These ideas can serve as design inspiration for Garfield Elementary School's outdoor learning environment.

The Kansas Children's Discovery Center

The Kansas Children's Discovery Center in Topeka, Kansas is a natural learning environment that I had the opportunity to visit on Sunday, November 4th, 2012. (See Figure 2.23 on the next page.) This facility consists of both indoor and outdoor learning environments. The indoor facility serves as an art exploration and science discovery center. In contrast, the outdoor learning environment encourages children to build confidence by testing athleticism and motor skills.

Figure 2.24—Children's Discovery Center
A facility offering both indoor and outdoor learning activity opportunities in Topeka, KS


4480 SW 10

Figure 2.25—Sensory Play Center
A variety of wall textures and foam padding allow for sensory exploration

Figure 2.26—Building Center
The building center encourages hand-eye coordination and construction skills

Figure 2.27—Painting Wall
Creativity and expression are encouraged on this art wall

Indoor Learning Facility

The indoor learning facility allows children to experience both scientific and artistic exploration. Children who visit the discovery center are able to interact in a range of play areas that accommodate for children from the ages of 0 through 12. Toddlers and infants have a sensory play center that is foam padded. The play area has a variety of different materials covering the walls, enabling individuals in the young age group to learn through the sense of touch. (See Figure 2.24.) Adjacent is a building station that serves a range of ages. The younger children (ages 3 to 7) can stack wooden blocks while older children (ages 8 to 12) can build wooden cars and other creations utilizing tools such as hammers and saws with the assistance of their parents. (See Figure 2.25.) A glass enclosed room offers children the opportunity to explore their creativity by painting on the walls with water based paint and foam brushes. (See Figure 2.26.) And an air exploration center is located in the middle of the indoor play facility. Children of all ages love interacting with the air discovery machines. These contraptions educate youths on the subjects of air pressure and wind power. (See Figure 2.27.) The interactive nature of the indoor play facility gives children the ability to

Figure 2.28—Air Exploration Center
Children learn about the process of wind power at this exploration station

Outdoor Learning Environment

The outdoor learning environment, however, is the gem of the Kansas Children's Discovery Center. Through partnering with Senior Eagle Scouts in the Topeka area that are working on their final projects, the discovery center has implemented a series of outdoor challenge courses. One of the challenge coarse features is a rock pile that reaches a height of five feet. The rock pile was created by stacking enormous limestone cap stones upon one another much like a pyramid. Children can climb upon this play feature—encouraging upper body strength development. (See Figure 2.28.) Another challenge course is a simple piece of balancing equipment; it consists of cut up logs strung up by ropes that rise about one to two inches off of the ground. Children can improve coordination on this piece of equipment as they attempt to steady themselves while walking across the logs. (See Figure 2.29.) The most challenging coarse feature consists of a series of logs with ropes hanging overhead that allow the child to walk along the logs with the stabilization of the ropes. A series of tire swings is also connected to this play feature. (See Figure 2.30.) By testing themselves on these pieces of challenge course equipment, children can enhance motor development, physical strength, and cognitive thought.

Figure 2.29—Rock Climbing Mound
Encourages upper body strength and development

Figure 2.30—Balancing Logs
Improves balance and coordination

Figure 2.31—Rope-Log Climber
Enhances motor development, physical strength, and cognitive thought

Figure 2.32—Learning Pavilion
Serves as an outdoor classroom and gathering space

Figure 2.33—Wooden Tree House
Simple design encourages imagination to guide children's play

Figure 2.34—Outdoor Music Center
A range of instruments offer children the opportunity to explore sound quality

Other site features include an enormous three story wooden tree house, an outdoor musical play center, a paved bike trail system, a wooden learning pavilion, and several raised planting bed stations made from recycled steel stock tanks. (See Figure 2.31 to view the learning pavilion.) The well-loved of these play areas include the tree house, musical play center, and bike trail system. The tree house, left unpainted, allows children to climb to canopy level and view the entire site. And because of its simplicity, the structure allows imagination to guide the children's play activities. (See Figure 2.32.) The musical play center consists of a simple wooden stage for performances, tin buckets that are arranged to act as a drum set, and tin pipes compose the vertical xylophone. Children can interact with the sound qualities of the outdoors in this musical play center. (See Figure 2.33.) In my observations of the children's interactions on-site, the bike trail system is the most well loved feature at the discovery center. The trail system consists of five foot wide sidewalks painted in a whimsical butter cream yellow. Arranged organically about the site, the trail system offers children of all ages the chance to interact with a range of bikes, trikes, and wagons. About ten to twelve of these different wheeled devises are stored in a shed along the path. Children can trade out the different vehicles at this storage shed to test out the different models. (See Figure 2.34.) The range of activities offered within this exploration-focused outdoor learning site enables children to develop meaningful relationships with nature. However, enjoyable and fun play areas are not all that is needed to encourage children to establish a bond with nature. Adult support is also necessary. Children seek to please and, therefore, must feel adult approval for time spent engaged with the natural world.

The remaining features of the outdoor learning environment are undeveloped. These include a large river-like waterfall, a native prairie grass area, and a series of butterfly rain gardens. The Indoor/Outdoor Sunflower Climber, the Tin Man Water Exhibit, the Paleontology Dig Exhibit, and the Garbo Lei family Treasure Garden are other future play areas. Bioswales and art easels are also scheduled for inclusion within the site. The next feature to be built is the water feature. It will resemble a wide river cascading down a gentile hill and culminates in a still pool. River rocks underlying the water will create directional changes and augment the sound of the flowing water. Water will be cycled through the system to ensure that the water fall is always flowing. Once these features have been incorporated into the outdoor learning environment, children will encounter an even larger range of interactive play areas that encourage awareness and connection to nature. The greater the range of play opportunities, the less likely it is that youths will become

Figure 2.35—Bicycle/Tricycle Path
Children can choose among 10 to 12 different wheeled devises to use on the bicycle/tricycle path, which is a favorite activity

Figure 2.36—Potgieterstraat Moguls
Elevation changes create spatial interest in the outdoor environment

Figure 2.37— Natural Materials
Materiality promotes the human-nature bond at Garden City Play Environment

Figure 2.38— BUGA Paths
Paths organize and guide children's experience of outdoor space

bored with an outdoor play environment. It is also important to keep play features simple to allow children to decide their own forms of play utilizing imagination.

Other Precedents

The playgrounds described in this section have been demonstrated as successful in providing areas for fun, interactive play. Their successes are expressed by the significant amount of user interaction that they encourage. Local children's love and usage of these play spaces demonstrate the "fun" qualities within a play environment that are needed to capture user imagination. Several playground designs from Michelle Galindo's book *Playground Design* described below offer play area design ideas and spatial organization insights that influenced the master plan development of Garfield Elementary School's Outdoor Learning Environment. Reoccurring elements appear in many of these precedent studies. These elements include the incorporation of elevation changes, exposure to natural play materials, and the inclusion of paths.

Both the projects *Safe Zone* located in Grand-Métis by Stoss Landscape Urbanism and *Potgieterstraat* located in Amsterdam by Carve, include small moguls within the playground site. (See Figure 2.35 to view *Potgieterstraat*'s moguls.) These moguls encourage young children to crawl and climb, as well as create spatial variety and interest within the playground. Such changes in topography offer children a more stimulating play environment—one that encourages increased levels of user activity within the space. The project *Crater Lake* located in Kobe, Hyogo by 24° Studio includes an immense wooden climbing structure. Likewise, the *Park des Prés de Lyon* in La Chapelle St-Luc designed by BASE is composed of a similar structure—in both material and form. Children who have the opportunity to climb on such forms can enhance upper body strength and development.

Children exposed to natural play materials have a greater opportunity to connect with the outdoors. Ver de landschaftsarchitektur's project *Im Gefilde Playground* located in Munich utilizes many natural materials within the site design. This project consists of a large sand filled play space with wooden play equipment pieces. Likewise, the *Garden City Play Environment* in Richmond designed by Space2place incorporates natural materials such as an immense gnarled wooden stump for climbing and planters filled with native grasses. (See Figure 2.36 to view Garden City Play Environment's wooden climbing structure.) Children need clear, distinct examples of nature like the large masses of natural elements found in these projects to build associations with the natural environment. When children can distinguish elements of nature and comprehend their relationship to the environment, they can create emotional connections to place.

The inclusion of paths is a common, yet simple feature of most playgrounds. Yet the significance of the path cannot be undermined. Paths guide user interaction within a space. They not only shape the manner in which people move through the site, but also the way in which the site reveals itself to the user(s). The project *BUGA* designed by Rainer Schmidt Landschaftsarchitekten in Munich focuses on organic paths as the primary organizing design element for the playground. (See Figure 2.37 to view BUGA's paths.) Due to the presence of the path system throughout the playground, users are able to move throughout all play areas. The path material is composed of a red poured rubber surface, signifying the importance of the path in achieving the project's design. Also, because the paths are composed of the poured rubber material, then it is easier for disabled students to interact with the site. One of the primary goals of public school playground design is to provide equal play opportunities to all students. Therefore, it is best to locate the path in close proximity to the different play areas within a playground. This spatial organization allows children with disabilities to have easy access to the same play areas as other students.

The three reoccurring design elements described in this section are incorporated into the design for Garfield Elementary School's Outdoor Learning Environment, which is described in detail in *Part II* of this book. Elevation changes, exposure to natural play materials, and the inclusion of paths within the playground design will create a varied spatial environment that is fun, interactive, and commemorative of nature.

II. Designing a Sensory Outdoor Learning Environment for Garfield Elementary School

“There was a child went forth every day;

And the first object he look’d upon, that object he became;

And that object became part of him for the day, or a certain part of

the day, or for many years, or stretching cycles of years.”

—Walt Whitman’s poem “There Was a Child Went Forth” from his “Leaves of Grass” collection first published in 1855

Site Analysis

Augusta Kansas History

The History of Human-Nature Relationships

The town of Augusta, Kansas was developed at the location where the Walnut and White Rivers forge by C. N. James who built the town's first log cabin in 1868. This earliest structure functioned as a convenience store and trading point for settlers moving west. The development of initial homesteads was centered on this central building and meeting place. Before C. N. James catalyzed the development of the town, the Wichita then Osage Indian tribes occupied the land. The land of Augusta was described in these early times as being "the most flourishing and enterprising place in Southwestern Kansas" (Handbill, 1869). Early descriptions of Augusta land represent peoples' view of nature—and thereby express their connections to the land—during those times. Here is an example of an early description of the land of Augusta from a Handbill printed in 1869.

"Augusta is situated on an eminence far above the water's highest tide, and surrounded by the loveliest landscapes that grace the face of mother earth, with ever-changing views of highland, low land with valleys threaded by the Walnut, White Water, and their numerous tributaries, beautified by the presence of woodlands of great extent and luxuriant growth, Augusta and its surroundings present to the eye of the observer one of the riches, most varied and pleasing pictures that the skillful band of nature has ever drawn" (Handbill, 1869).

However, the human connection to nature in Augusta has been reduced over time. The four major phases of the Augustans' relationship with nature are: 1) Native Americans occupied the land—first the Wichita and then the Osage Indians—and lived in a sustainable way that was intimately connected to Earth's natural processes; 2) settlers moved into Augusta and started an agrarian-based society; 3) the oil boom hit Augusta, marking the beginning phase of mankind's neglect of the natural environment; 4) the commuter society developed, where Augustans reside in Augusta, but commute to Wichita for work. The commuter society is the town's response to the closure of the oil refineries and is the current phase of Augusta's human-nature relationship. The first two phases of Augusta's history mark a heavy human reliance upon the health of the land; only by utilizing and maintaining local resources were the livelihoods of these peoples sustained. The third and fourth phases of human development signify the change in this relationship—people became disconnected from nature and began to rely on resources that were imported into the area. Currently, Augustans' ties to the land have been urged into dormancy, promoting the need for urban landscapes that can re-awaken the human-nature bond.

School Description

Garfield Elementary School Location

Garfield Elementary School is located in the city of Augusta Kansas at a distance of about 18 miles east of Wichita with a commute drive time of about 30 minutes. The current population of the town is 9,274 and is currently experiencing a population growth of about 1% annually as a result of many families choosing to live in Augusta and commute to and from Wichita for work (City-data, 2012). One reason for this trend is the quality of the schools.

School Address

135 High Street Augusta, Kansas 67010

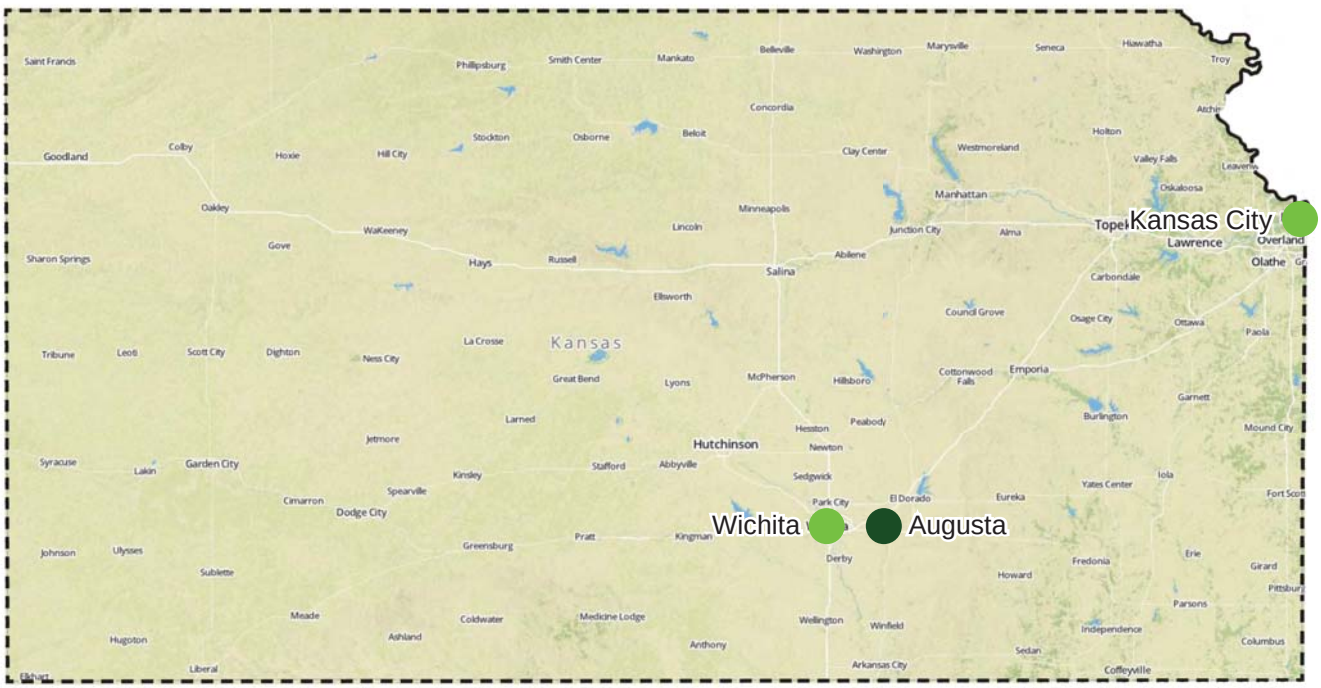


Figure 3.01—Augusta Kansas Location
Augusta Kansas is 30 minutes away from the east edge of Wichita

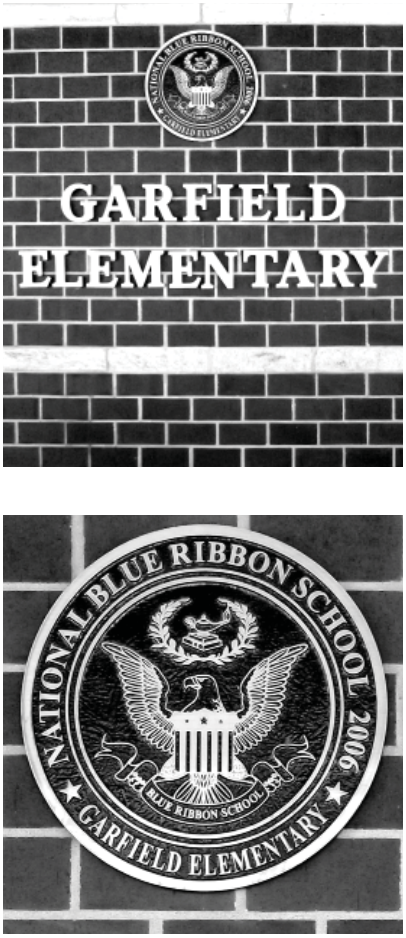


Figure 3.02—A Blue Ribbon School
Garfield school has won many awards

A School of Achievement

The Augusta School system has been recognized nationally and statewide for its high student achievement. For example, in 2006 Garfield won the *No Child Left Behind Blue Ribbon School* award, which is only awarded to five Kansas schools annually. Garfield was one out of the six schools in the United States to win the *Panasonic National School Change Award* in 2008. From the years 2005 through 2012, Garfield Elementary School students earned the *Kansas Standard of Excellence* in the subjects of Reading, Math, and Science. And in both 2007 and 2010, Garfield Elementary School won Kansas's *Title One Challenge Award*. These awards are demonstrative of the effort put forth by both the students and teaching staff at Garfield Elementary School in their pursuit of student achievement and learning.

School History

Garfield is one of the four elementary schools within the USD 402 school district; the others are Lincoln, Robinson, and Ewalt. Garfield was the second elementary school built in Augusta and was approved for construction by the school board in 1917. "The first school on the Garfield site was built in 1918 and remodeled in 1955 and added to in 1979" (Augusta Daily Gazette, 2007). In 2008, district taxpayers approved a $48 million bond issue to pay for the construction of new Lincoln and Garfield Elementary Schools, and renovations to the Augusta Middle School, Augusta High School, Robinson Elementary School and Ewalt Elementary School (Mann, 2007). The new Garfield Elementary School is 60,000 square feet and was constructed a cost of $14.25 million (Augusta Daily Gazette, 2012).

A New Elementary School Building

The newly-constructed Garfield Elementary School building, when viewed from an aerial perspective, is “V”-shaped. The main entry into the school building is located at the apex of the “V” on the northeast side of the site. Located near the building entrance to the east of the entry doors are the Principal’s Office, the Nurse’s Office, the Secretary’s Office, the Mail Room, and the Copier Room. To the left are the Teacher’s Lounge and Kitchen areas. The loading dock is also located on this side of the building, directly to the west of the Kitchen area. The entryway opens into the Student Dining area, which functions as a multi-purpose room with the tables and chairs easily removed between meals. First Grade through Fifth Grade classrooms, the Computer Lab, and the Library are also located in the west wing of the building. On the east wing of the “V” are the Counselor’s Office, the School Psychologist’s Office, the Early Childhood and Kindergarten classrooms. Classrooms for Special Education, Art, and the English Language Learners are located on the east wing as well; they are directly adjacent to the Outdoor Wildlife Learning Sites (OWLS) and Early Childhood/Kindergarten outdoor activity areas with windows overlooking these spaces. The Speech classroom, Gifted Education classroom, Gymnasium, Music classroom, and Stage areas are also located on the east wing toward the southernmost end of the building. Student and adult restrooms are located along both wings of the building as well as in the apex of the “V.”

Figure 3.03—“V”-Shaped Building
Garfield Elementary School is v-shaped

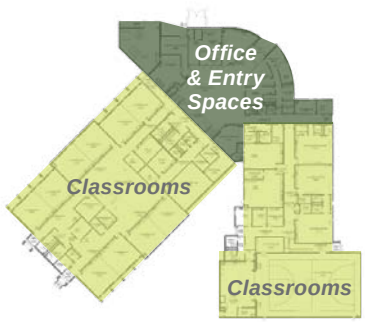


Figure 3.04—Building Layout
Classrooms are located in the wings of the “V” with the office areas located at the apex of the “V”

Figure 3.05—New School Building
Garfield Elementary School has recently been rebuilt with construction ending in January 2012

School Grounds Description

Geographical Constraints

The construction of the new school building on the Garfield Elementary School site created two geographical constraints on the school's outdoor spaces. These include: 1) a reduction in the size of outdoor space provided—which thereby decreased the amount of activity space available to children and 2) the creation of significant separations between the four primary activity areas—further emphasizing the limited amount of activity space available to students.

A Reduction in Overall Playground Size

The geographical boundaries of the site are all of Garfield Elementary School's unpaved outdoor spaces. Four streets (High Street to the north, Osage Street to the east, Columbia Street to the south, and State Street to the west) surround the block that the school occupies, acting as site boundaries. The whole block is about 700'x400' or about 6.5 acres total. A large parking lot constructed on the southwest corner of the site also reduces the amount of square footage that can be used by students to play and experience the outdoors. With the new school building's larger size and the addition of the large teacher parking area, the area available for students' outdoor play has been significantly lessened from about 4.25 acres or 2/3 of the total site to about 2 acres or 1/3 of the total site. (See Figures 3.07 and 3.08 for visual comparison of the new and old Garfield Elementary School site layout.) With this significant decrease in outdoor play space, it is extremely important that a comprehensive and meaningful design guide the development of Garfield's grounds.

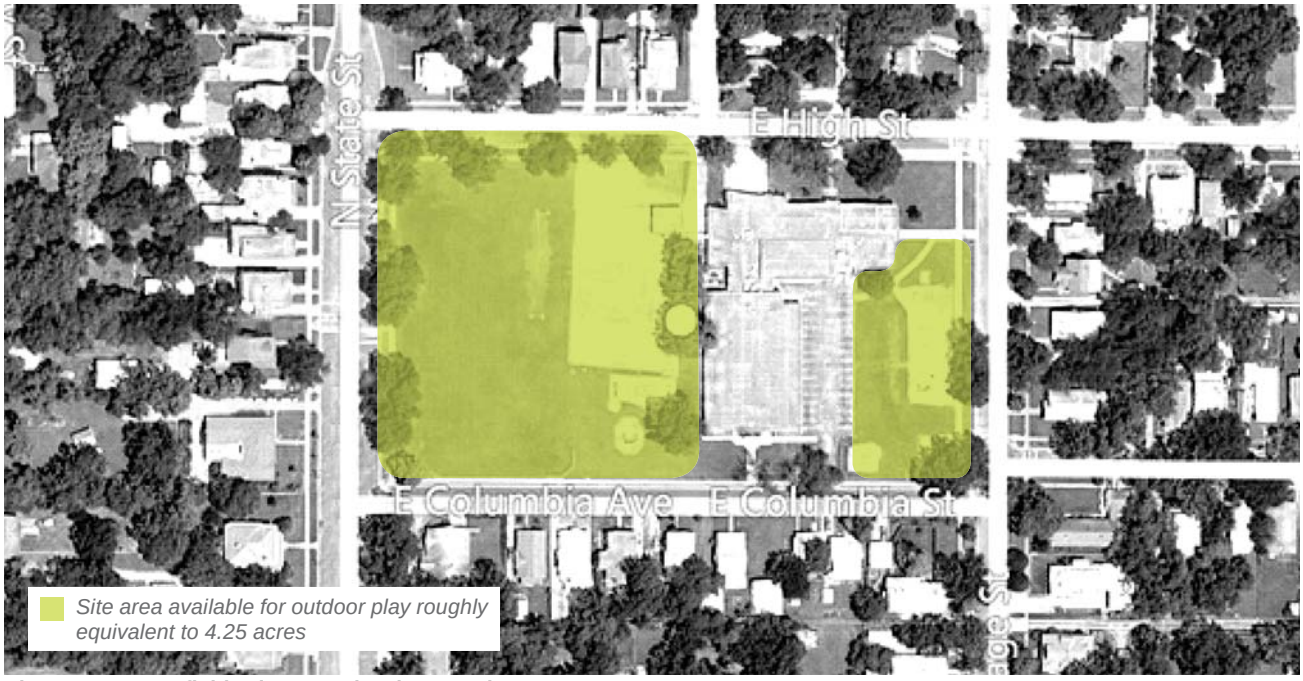


Figure 3.06—Garfield Prior to Redevelopment in 2010
Designated playground areas account for over half of the school site

Figure 3.07—Garfield During Redevelopment in 2012
Designated playground areas account for roughly a third of the school site

Separation of Activity Areas

A result of the reduction in unpaved outdoor space is that the different activitiy zones encompassed on-site have been significantly separated spatially, which could potentially decrease the overall design unity of the Outdoor Learning Environment. Currently, there are four different activity areas in the school's new site design. For clarity purposes, I have labeled these different areas Activity Area A, Activity Area B, Activity Area C, and Activity Area D. (Refer to Figure 3.09 for the locations of these zones on the site.) Each of these zones must accommodate specific recreational activities and age groups of children. (Refer to the *Spatial Organization* section below for a detailed explanation of the activities and age groups that each play area accommodates.)

Spatial Organization

The area dedicated to outdoor activity space at Garfield has been significantly reduced as a result of increased building and parking lot size requirements. Therefore, it was necessary for PBA Architects to develop different activity areas that are spatially separated. (See Figure 3.09 for the location of these different areas on-site.) Early Childhood and Kindergarten students utilize Activity Area A. (See Figure 3.10). Activity Area A consists of stationary playground equipment that is appropriate for children from the ages of four through six—who are the primary users of the space. Activity Area A is directly south of the designated OWLS site, which is accessible to all students. The OWLS site is directly adjacent to the Art, English Language Learner (ELL), Special Education, and Gifted Education classrooms. (See Figure 3.11.) First through Fifth Grade students utilize Activity Areas B, C, and D. (Refer to Figures 3.12 through 3.14 for images of these zones on-site). Activity Area B is paved; this space includes basketball hoops, tetherball, hopscotch, and four square play areas. Activity Area C is the grassy field play area that provides students with space for organized games and field sports such as soccer and kick ball. Activity Area D is the stationary play equipment area that is appropriate for children between the ages of six and twelve.

Significant grade changes occur between Activity Areas C and D in the form of a three foot high terrace with a roughly 30% angled slope that is covered with grass. See *Appendix A* for models and locations of the stationary playground equipment pieces that are utilized in Activity Areas A and D. A similar terrace occurs along the north and west edges of Activity Area D, separating the activity zone from the sidewalk edge. (Refer to Figure 3.15 in order to visualize these grade changes.)

Garfield's Activity Areas

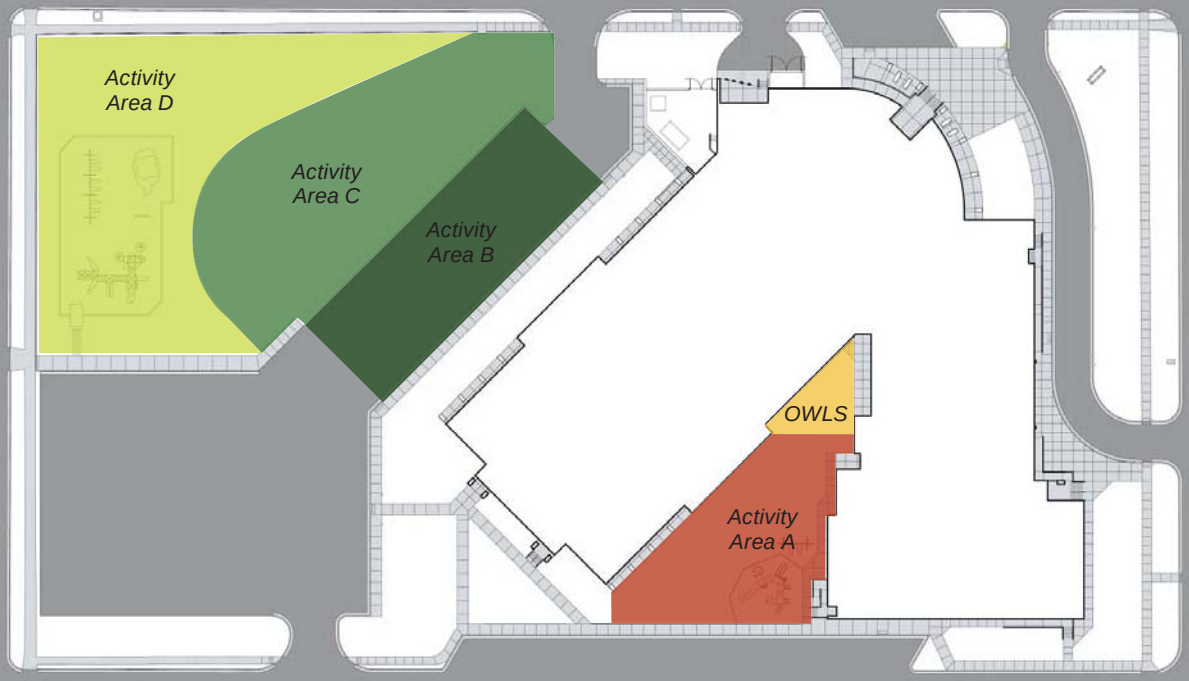


Figure 3.08—Garfield's Activity Areas
Garfield Elementary School's activity areas are spatially separated

Figure 3.09—Activity Area A
The Early Childhood and Kindergarten students use this activity area

Figure 3.10—Outdoor Wildlife Learning Site (OWLS)
All Garfield Elementary School students use this area of the school grounds

Figure 3.11—Activity Area B
First through Fifth Grade students use this hard surface activity area

Figure 3.12—Activity Area C
First through Fifth Grade students use this designated soccer field activity space

Figure 3.13—Activity Area D
First through Fifth Grade students use the stationary play equipment in this activity area

Figure 3.14—Grade Level Changes
Two grade level changes occur in Activity Areas C and D

Neighborhood Description

Garfield Elementary School is situated in a single-family residential neighborhood near the center of Augusta, Kansas. The school occupies a one block area and is bordered by High Street to the north, Osage Street to the East, Columbia Street to the South, and Augusta's historic State Street to the west. State Street is Augusta's "main street" and leads to downtown shops and businesses further south. Augusta Middle School is located one block south of the elementary school on the west side of State Street.

The neighborhood surrounding Garfield is quiet and peaceful most hours of the day. Children frequently ride their bikes on the low-traffic streets or play on the school grounds. Only vehicular traffic disrupts the quiet roads during school start and dismissal times.

Garfield Elementary School is the heart of this neighborhood and acts as a community resource with the potential to positively impact the quality of life for neighborhood residents and students. In order to enact these positive changes, the design for the recreational outdoor environment emphasizes the elements and landforms of nature in a landscape narrative— encouraging the establishment of a bond between children and nature.

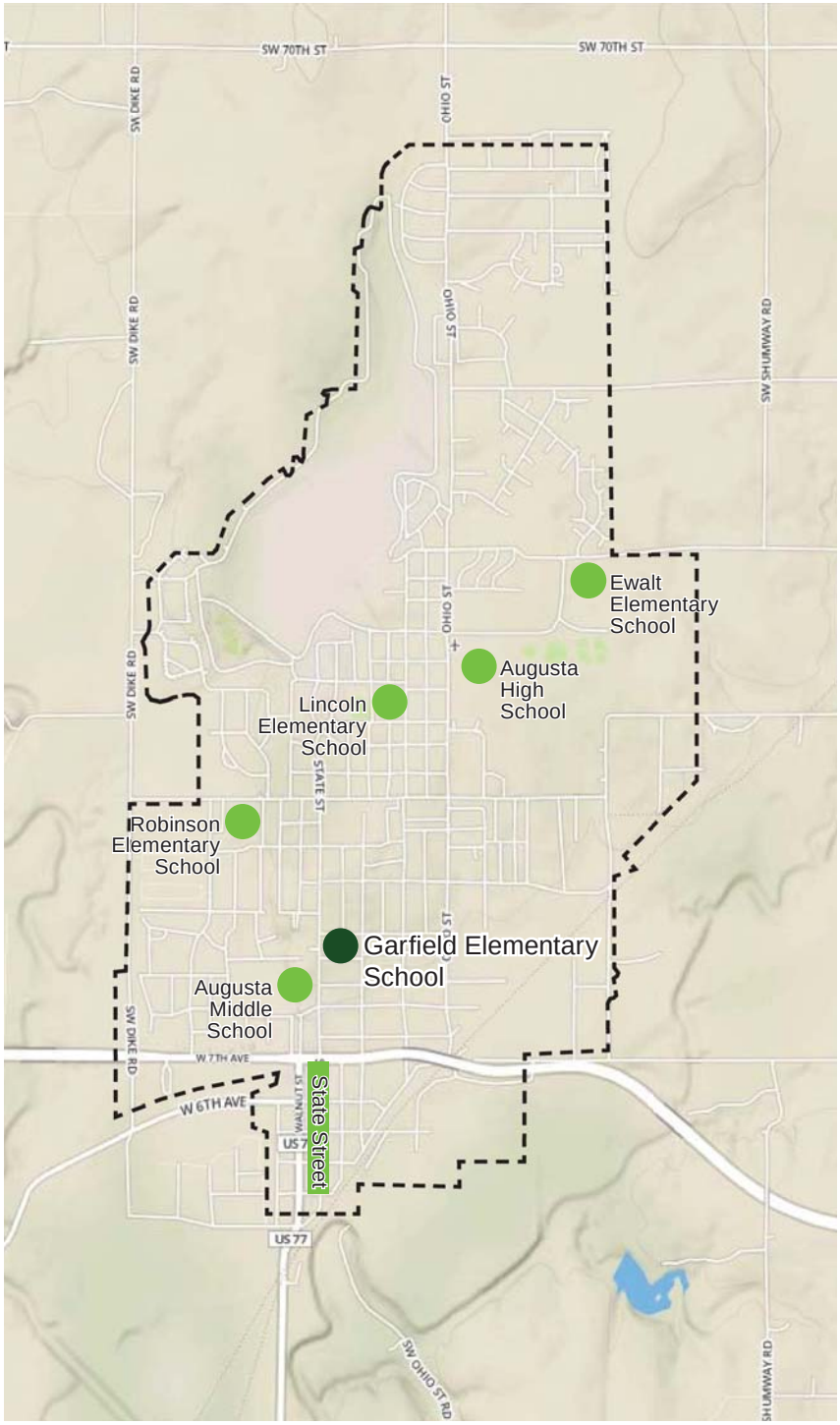


Figure 3.15—Garfield Elementary School Location
The school is located in Augusta near the Middle School and State Street

Student Demographic Description

Enrollment during the 2011-2012 school year at Garfield Elementary School was 236 students (Kansas State Department of Education, 2012). Garfield Elementary School is located within a low-income residential area of Augusta, Kansas, and the number of students who received *Free and Reduced* school meals at Garfield Elementary School during the 2011-2012 school year was 119 out of 236. This means 50.42% percent of the students attending Garfield live at the poverty level. Only Robinson Elementary School in Augusta has a higher percentage with 60.08% of the student body enrolled to receive Free and Reduced meals. Ewalt and Lincoln Elementary Schools each have less than 36% of their students receiving Free and Reduced Enrollment (Kansas State Department of Education, 2012).

Students from low-income families tend to have a slight disadvantage in terms of having access to stimulating outdoor environments. One of the possible sources of this disadvantage is that many of these children might be from divided or single parent homes, which could result in a reliance on more self-directed learning and play. Children might also have fewer opportunities for travel because of their parents' finances—causing them to rely solely on local environments as sources of entertainment.

Only 25 out of the 236 students attending Garfield Elementary School ride the bus to and from school daily. This means that about 90% of the student body either lives within 2.5 miles of the school or that 90% of the students have parents able to drive them to the school. Either way, Garfield Elementary School is easily accessible to 90% of the student population. Therefore, the school grounds of Garfield have the potential to play a significant role in offering children opportunities to interact with the outdoors. The development of a sensory outdoor learning environment on Garfield's school grounds could prove to be instrumental in not only stimulating learning and inviting play, but more importantly encouraging children to develop a bond with nature.

Garfield Elementary School Staff

Garfield Elementary School staff's range of interests and talents contribute to creating an inspiring and learning-conducive environment for students. Thirteen classroom teachers work at Garfield Elementary School; one Early Childhood educator and two teachers for each grade level from Kindergarten through 5th Grade. The pupil-teacher ratio is about twenty to one. Two Special Education teachers and one Title One Reading teacher work at Garfield as well. There are also seven Title One Paraprofessional Educators[3], seven Special Education Paraprofessional Educators, three full-time and one part-time Early Childhood Paraprofessional Educators, and one English Language Learner Paraprofessional Educator. Other staff members include a principal, a librarian, a secretary, and three full time custodians.

One of the main characteristics of the school district's teaching staff is that it incorporates a large amount of partner teaching with the other schools in the district. Garfield Elementary School's Physical Education teacher and Music teacher alternate teaching every other day at Garfield and partner teach at Ewalt Elementary School. The Art teacher and Computer teacher also alternate teach every other day at Garfield, but just for one semester out of the academic school year; these two teachers are utilized by all four elementary schools in the district. The English Language Learners (ELL) teacher is shared between all schools in the district—including the middle and high schools; the time that she spends at each school is based on the number of students in need of the service and which schools they attend. The school's counselor and nurse are shared with Robinson Elementary School and they alternate between the schools each day. The school's speech teacher is shared between Garfield, Augusta Middle School, and Head Start (a school program for two and three year old children). The School Psychologist works for Garfield and Ewalt Elementary Schools, and the high school.

Another important characteristic of the school are the many community volunteers who help the school to run smoothly. There are about 10 Parent-Teacher Organization (PTO) volunteers annually and about 20 other parent and community member volunteers who help with recess and lunch duty, act as crossing guards, aid with individual student reading programs, or other miscellaneous activities around the school. Also, about five student teachers work at Garfield Elementary School each year at various grade levels.

[3]A paraprofessional educator, "often referred to as an aide, is an education worker who is not licensed to teach, but performs many duties both individually with students and organizationally in the classroom. A paraprofessional works in support of the teacher" Mauro, T. (2013). What Is a Paraprofessional? About.com Children with Special Needs. Retrieved April 10, 2013, from specialchildren.about.com/od/specialeducation/g/parapro.htm

Kansas Climate Description

A Harsh Climate

The Kansas climate is harsh; it is an environment that is characterized by extremes. From below freezing temperatures to over 100 degrees summer days, Kansas experiences a range of weather. From rain, to sleet, to hail, to snow, precipitation occurs in all forms. There are muggy humid days and bone-dry ones. Daylight is reduced to about eight hours during the December 21st winter solstice and it is extended to 14 hours on June 21st during the summer solstice. High winds are also abundant on the Great Plains, with the wind speed averaging about 12 miles per hour daily throughout the year.

Precipitation

Much like all weather conditions in Kansas, precipitation also occurs in extremes. Rain and snow may not transpire often, but when they do, it is in torrential amounts. The old expression, “When it rains, it pours” is a perfect description of the precipitation patterns that occur in Kansas. In fact, around forty percent of Kansas’s precipitation occurs during thunderstorms. And about 15 inches of snow falls annually in Kansas’s three to four significant snowfalls. A lack of precipitation is also characteristic of the Kansas climate. Periods of drought, especially noticeable in the sweltering summer months occur annually in Kansas.

Rapidly-Changing Atmospheric Conditions

Perhaps the most significant characteristic of the Kansas climate is the rapidity with which local weather conditions can change. For example, it is not atypical in the Wichita Kansas area to be a warm 80 degrees on Friday with light wind, and then transition into a rainy 50 degrees on Monday, followed by a below 30 degrees and snowing Wednesday. Such frequently changing atmospheric conditions onsite are resultant of Kansas’s location within the center of the United States, which is at the intersection of the country’s wind patterns. Brought with these outside winds are the atmospheric conditions of the regions through which the wind passes; wind from the north brings cold, while wind from the south brings heat. As a result, not only are Kansans are exposed to the seasonal changes of weather, but also the range of atmospheric changes present within each of these seasons.

Changing Seasons

Kansas weather patterns can be grouped generally into four distinct seasons: spring, summer, autumn, and winter. Though each of these seasons has distinguishing characteristics, the lingering atmospheric conditions from one season can take place into the next. For example, a late snowfall—characteristic of the winter season—may occur in early spring. Or a 90 degrees day—characteristic of the summer season—may occur in autumn. Therefore, it may be summarized that the atmospheric conditions characteristic of each particular season do not occur exclusively within that season.

Figure 3.16—Spring
Tulips at Luxembourg Gardens in Paris

Spring

Spring occurs from March through May and is characterized by rain, and the renewal or “awakening” of plants that went into a dormant phase during the winter months. Spring is also a time of tornados in Kansas and the Midwest region of the United States; these violent storms are brought on by hot and cold fronts merging together over the Great Plains area. The spring months can still be subject to lingering effects of winter in the form of frosts and snowfall. Also, summer weather conditions, which typically occur from June through August, may be early to set in—interrupting the largely mild temperatures of the spring season.

Figure 3.17—Summer
Road cut in Manhattan, KS

Summer

Summer is characterized by rising temperatures and infrequent but violent thunderstorms. Another trait of summer is that a period of seasonal drought often occurs in the months of July and August.

Figure 3.18—Autumn
Smooth Sumac in Manhattan, KS

Autumn

Autumn takes place during the months of September, October, and November. This season occurs when the temperatures turn gradually colder and the non-evergreen vegetation becomes dormant. The brilliant fall color that adorns the deciduous trees and shrubs of Kansas also occurs during autumn.

Figure 3.19—Winter
Snowfall in Orvieto, Italy

Winter

Winter takes place from December through February and is the season associated with cold and snowfall in Kansas. Significant amounts of snowfall (in the amount of one inch or more) take place, predominantly during winter, one to four times annually in Kansas. Daylight is significantly decreased during the winter season. And the lingering cold of winter often pervades into the early spring months.

Microclimate Descriptions

Wind

Wind enters the Garfield Elementary School grounds primarily from the south, southeast, or southwest—about 47% of Kansas's wind comes from these directions. The second most amount of wind enters the site from the north, northeast, or northwest directions at about 35%. At about 9%, the third most amount of wind enters from the east site boundary. Almost no wind blows from the western boundary.

The Early Childhood/Kindergarten and OWLS activity areas are the most protected areas from wind because building walls surround the space to the north, east, and west—forming a large courtyard-like space. This layout offers protection from wind by forcing winds of any direction to blow around the building rather than through the space.

Wind Exposure

most exposed to wind *least exposed to wind*

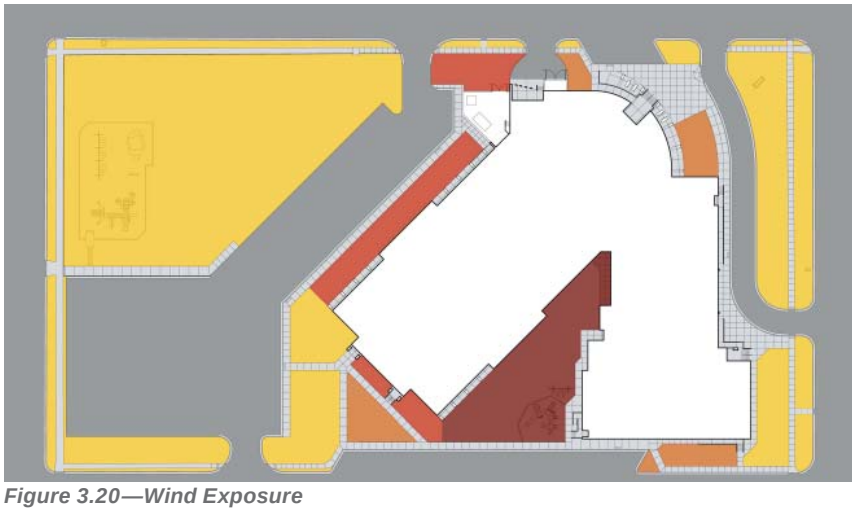


Figure 3.20—Wind Exposure
The most protected areas are those closest to the building

Solar Access

Sunlight shines from the east, south, and west. In the morning, the sun enters the school grounds from the southeast and moves across the site until evening, when the sun enters the site from the southwest. (See Figure 3.23.) Around noon, the sunlight pours directly into the OWLS and Early Childhood/ Kindergarten activity areas. The OWLS area is shaded for a larger part of the day while the Early Childhood/ Kindergarten activity area collects sunlight. Other shaded areas include the “leftover” space on the west side of the building and the school grounds along the north side of the school building. The remaining site areas receive at least six or more hours of direct sunlight. The southernmost portions of the site have the greatest opportunity to collect the sun’s warmth because they are oriented toward the sun and receive the most wind protection.

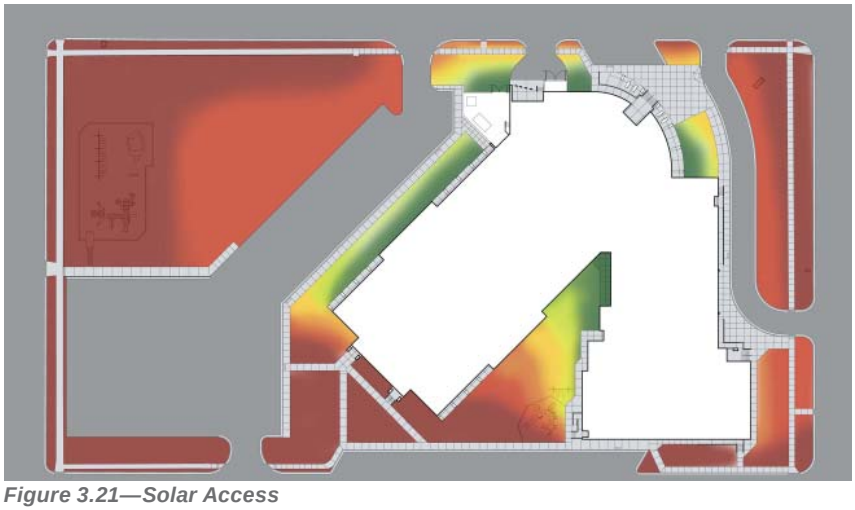


Figure 3.21—Solar Access
The most shaded areas onsite are green, while the sunniest are dark red.

Figure 3.22—Shade Study
Building model is courtesy of PBA Architects in Wichita, KS

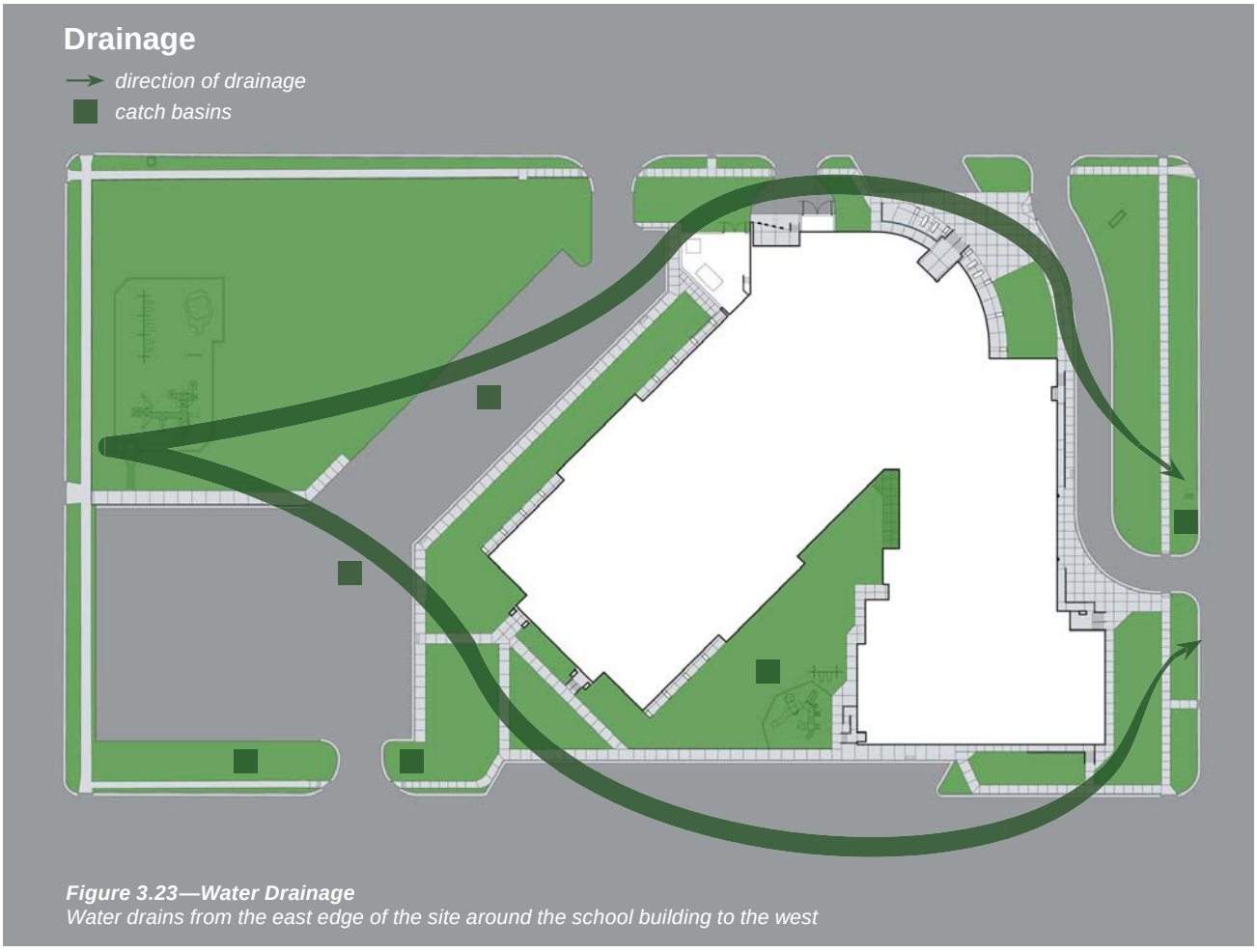


Figure 3.23—Water Drainage
Water drains from the east edge of the site around the school building to the west

Water Drainage

Water flows from west to east following the site elevation from high to low. Water on the northwest side of the site flows down two earth terraces in the 1st through 5th Grade activity area then around the school building to the site's east edge. Water on the southwest side follows a more gradual downward slope through the teacher parking lot to the southeast site edge. The building is elevated slightly from this surrounding land, preventing the water from draining into the foundation.

Site Analysis

Site Fragmentation

The areas designated for outdoor activity have been significantly reduced on the new Garfield site due to increased building and parking lot size requirements. The large parking lot located on the southwest corner of the site serves Garfield staff, parents, and visitors for middle school basketball games. The building itself is located about 80 feet from the east edge of the site, leaving about 50 feet of open space leftover. Further fragmentation of the site's open spaces is caused by the sidewalks crossing the school site. The result is that PBA Architects—the architecture firm commissioned to design the school—created two spatially separated play areas. (See Figure 3.09 on page 55 for the location of these different play areas.) The majority of the site's open space is actually found in the "leftover spaces."

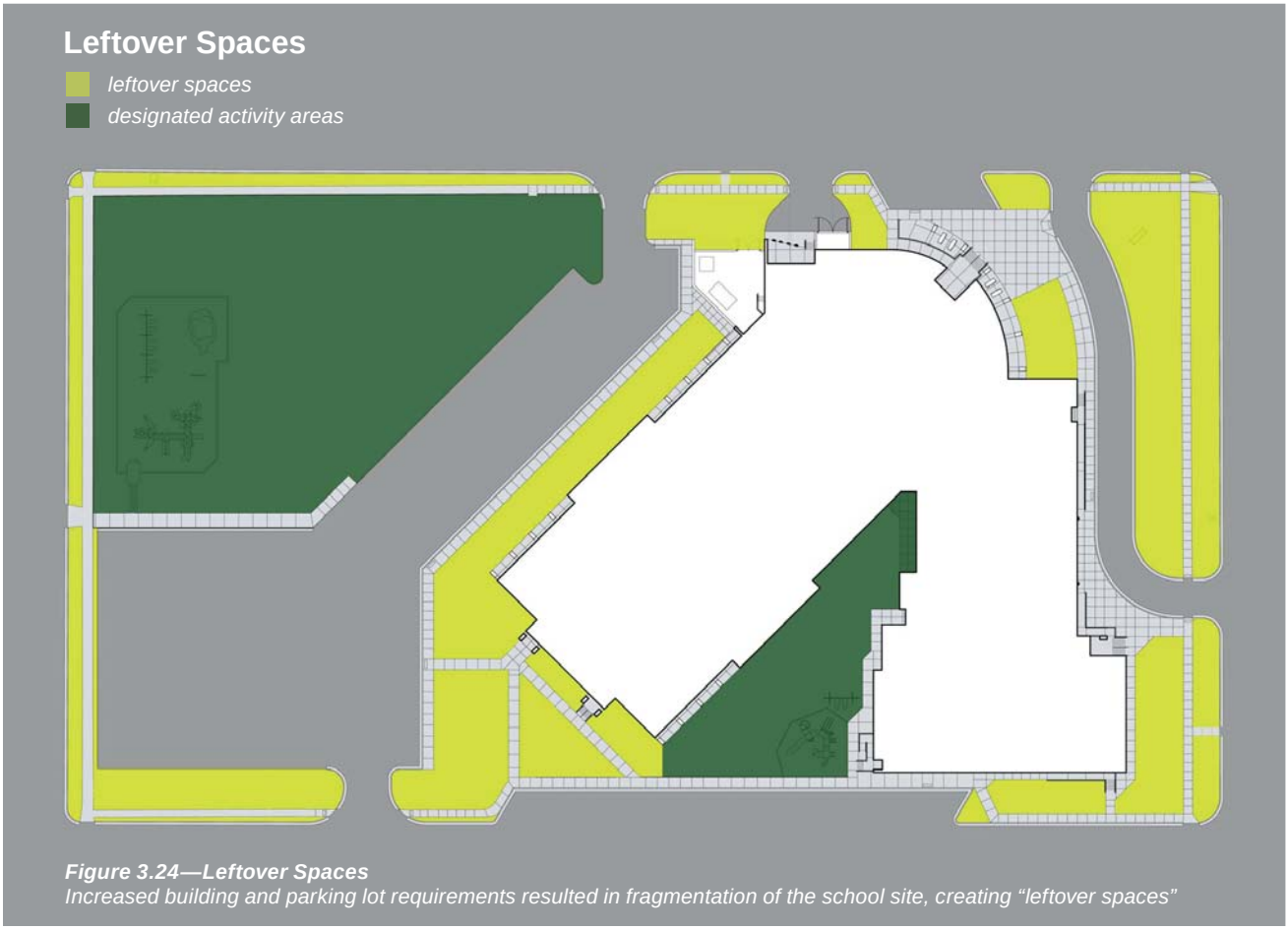


Figure 3.24—Leftover Spaces
Increased building and parking lot requirements resulted in fragmentation of the school site, creating "leftover spaces"

Community Access

Garfield Elementary School is a community resource. There is a sidewalk around the entire outer edge of the site that is accessible to the public at all times. More private areas on site are closer to the school building, and are utilized primarily by Garfield students and staff. The school's playground areas are restricted during school hours but are accessible to the public after school hours and on weekends. Chain link fences surround the designated children's play spaces, but openings in the fences give community members access to the site after school hours and on weekends.

Building Entrances

There are 13 school building entrances. All of these entrances are locked from the outside except the main building entrance, which is open during school hours. Garfield staff members have keys that enable them to access all entrances into building. The main entrance is located on the northeast corner of the building and is typically the only point of entry for students, parents, and visitors. Nevertheless, even these main doors remain locked until the school secretary is able to view the person(s) wishing to enter the building through a video camera. She then pushes a button allowing visitors to enter the building where they check in at the office. Seven secondary building exits are located on the south and east sides of the school building. Staff and students use these to access the teacher parking lot and outdoor activity areas. One secondary building entrance remains accessible to Little League Basketball teams that practice in the school gymnasium after school hours. (The Little League Basketball coach is given a key to access the gymnasium entrance.) Three entrances located on the north side of the school building are used as service entries. The two remaining building entrances are infrequently used and can be classified as tertiary entrances used primarily as emergency exits.

Pedestrian Circulation

The majority of community members pass around the perimeter of the site on the exterior sidewalks. The walks located within the outdoor activity areas are utilized primarily by Garfield students and staff; however, they may be used on the weekends and during after school hours by community members. Walks closest to the building are primarily utilized by Garfield students, parents, and staff entering the school building and are considered to be relatively private. The "leftover spaces" located on the edges of the site are of the utmost importance to incorporate in the design of this project. These edge spaces are the paths most frequently used by the community and can be the perfect place to advertise the Outdoor Learning Environment.

Community Access

most accessible to public ⟷ *least accessible to public*

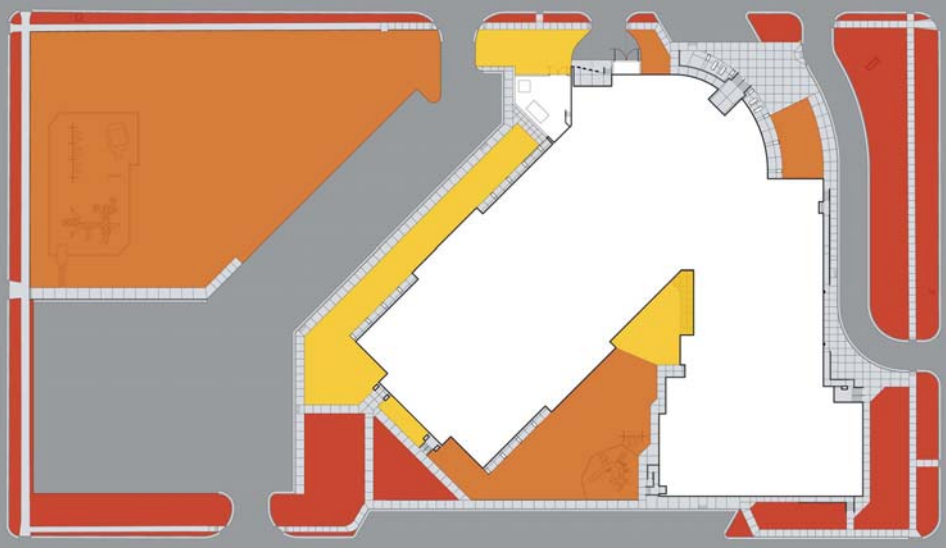


Figure 3.25—Community Access
The most accessible areas are located along the site perimeter, while private areas are closer to the building

Pedestrian Circulation

1. *primary building entry*
2. *secondary building entry*
3. *tertiary building entry*
S. *service entry*

primary circulation sidewalk
secondary circulation sidewalk
tertiary circulation sidewalk

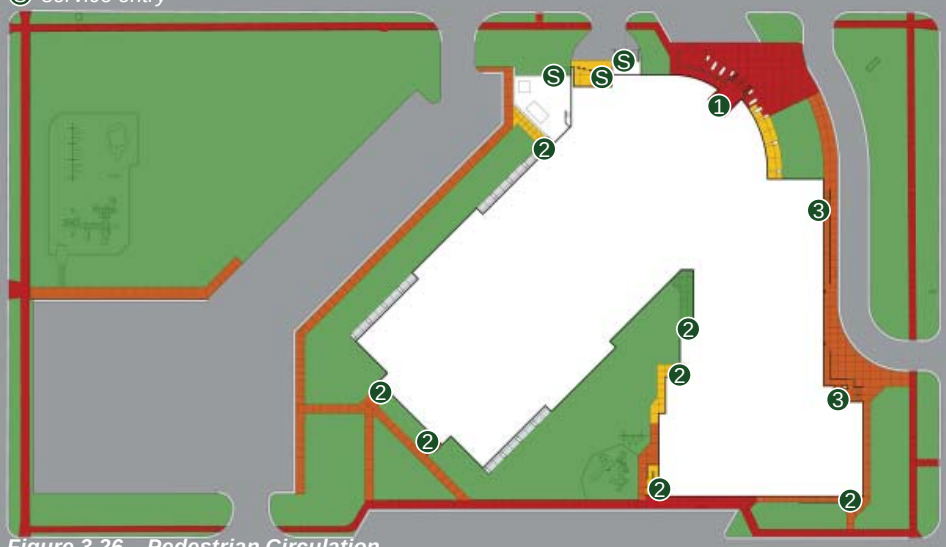


Figure 3.26—Pedestrian Circulation
Pedestrian circulation hierarchy and building entry locations are represented in this diagram

Vehicular Circulation

The site is accessible by vehicles through three entry points. Two of these are located along the north side. The northeast entry point is the main vehicular entry and functions as a drop off point along a one-way vehicular circulation route moving from north to south; it exits on the east site boundary near the south end of the school building. The other north entry is only used when the hard surface activity area is needed for extra parking at community events held at the school. The last vehicular access point is located along the south side, used by Garfield staff to access the teacher parking lot. The teacher parking lot also functions as a parking lot for parents during basketball games at the nearby middle school or at the Garfield school gymnasium.

State Street on the west is the busiest of the four streets surrounding the site and leads straight into Downtown Augusta and the Augusta Middle School two blocks to the south. The remaining streets surrounding the site have a significantly less amount of traffic than State Street during much of the day, but all of the streets surrounding Garfield are high traffic during school “pick-up” and “drop-off” hours.

Crosswalks

There are eight crosswalks connecting to the site. Two are located at the northeast corner of the Garfield Elementary School site. One crosswalk offers passage across High Street at the northwest corner of the school block. Another is located on the north side of the site near the middle of the school block passing across High Street. The southeast and southwest edges of the site each have one crosswalk across Columbia Street. On the east of the site, near the egress point of the one-way “drop-off and pick-up drive,” there is a crosswalk across Osage Street. Only one crosswalk crosses the busy State Street mid-block on the west.

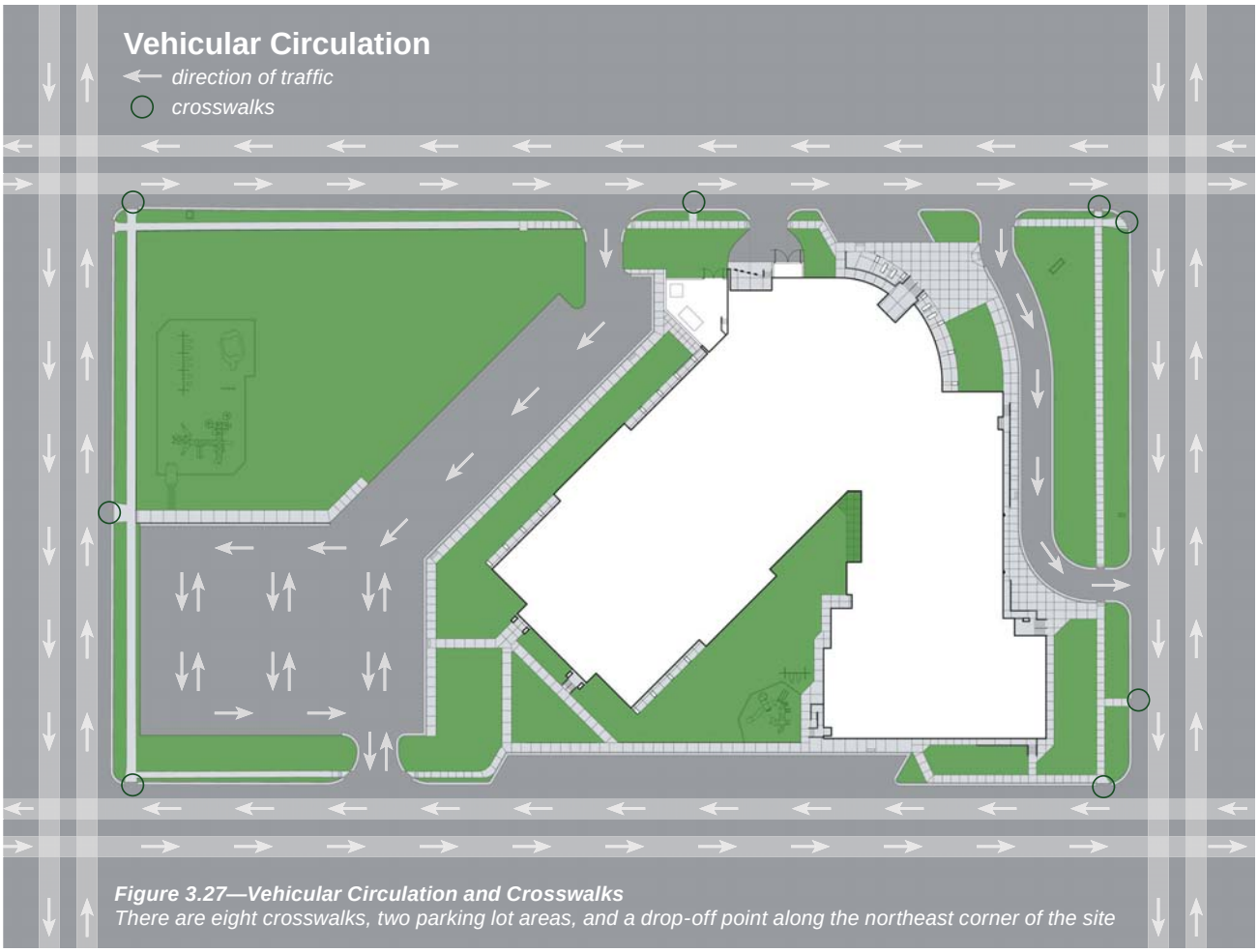


Figure 3.27—Vehicular Circulation and Crosswalks
There are eight crosswalks, two parking lot areas, and a drop-off point along the northeast corner of the site

Design Development

Design Development

A detailed design process guided the development of Garfield Elementary School's Outdoor Learning Environmnt including 1) conducting site analysis, 2) developing a design framework, and 3) utilizing design inspiration to guide the spatial organization of the site. The school's site analysis study inventoried historical, climatic, and cultural information. (Refer to the *Site Analysis* section on page 46 to locate specific information related to this site analysis study.) To develop the design framework, the works of Carles Broto, Julie Moir Messervy, and Rusty Keeler were consulted. Carles Broto and Rusty Keeler specialize in nature-based playground designs. Julie Moir Messervy is a renowned landscape architect who developed a theory that describes spatial environments to which people are inherently connected. These sources list the specific elements and spatial environments of nature that are necessary to include within an outdoor learning environment in order to provide children with increased opportunities to bond with nature. However, an overall organization scheme was needed to guide the incorporation of the spatial environments and elements of nature to make the proposed school grounds design cohesive. Three environmentalist-themed pieces of children's literature—*The Wump World* by Bill Peet, *The Lorax* by Dr. Seuss, and *Where the Wild Things Are* by Maurice Sendak—acted as inspiration to guide the site organization. By following these three steps in the design process, I was able to develop a unified design for Garfield's outdoor learning environment that offers students exposure to the elements and spatial variety of local nature.

Site Analysis Implications

The site analysis study conducted on the Garfield Elementary School site led to the creation of three design goals that informed the development of the Outdoor Learning Environment. These goals include: 1) Kansas's climate should be used to promote student awareness of local nature and 2) The site's "leftover spaces" should be incorporated into the overall spatial design to promote the site as a community resource and to connect separated activity zones thereby reducing the effects of site fragmentation. These goals acted as a foundation for the design framework that guided the development of Garfield Elementary School's Outdoor Learning Environment.

Using the Kansas Climate

The Kansas climate—its wind, water, and sunlight—should be used to make children more aware of local nature. Kansas is characterized by high winds, infrequent periods of precipitation, and relatively high sunlight exposure. Expressing these climatic conditions onsite through

simple, inexpensive installations can make these processes more visible and appreciated by children.

Wind

Wind—though invisible—is tangible and its movement can be exposed through the implementation of small windmills or wind flags. Even the site's plants can be selected to express wind movement.

Water

The presence of water onsite should also be celebrated. Not only is it necessary for human survival, but water in the form of the White and Walnut rivers is one of the primary reasons that people settled in Augusta. Therefore, the design of Garfield Elementary School's outdoor site should offer children the opportunity to appreciate and learn about water in Kansas. Water can be emphasized onsite by implementing a pond in the OWLS area, placing rain chains along building roofs for the gutter drop outlets to flow into, and by incorporating water troughs or fountains into activity areas. Water troughs or fountains could also offer children opportunities to interact with moving water.

Sunlight

Different qualities of sunlight (from shade to filtered light to full sun) should be emphasized in the Garfield Elementary School Outdoor Learning Environment. Part of the joy in site exploration is the student's ability to seek shade on a hot summer's day or the warmth of full sunlight in the cold of winter. Methods of expressing light quality include emphasizing the darkness of spaces that are in the shade, by planting trees that offer different shade qualities, or by just leaving several open areas exposed to full sunlight.

Incorporation of the Leftover Spaces

The "leftover spaces," as they were deemed in the *Site Analysis* section of this book on page 67, are integral to the development of a cohesive Outdoor Learning Environment on the Garfield Elementary School grounds. By integrating these small "leftover spaces" into the overall site design, they can act as unifying links to connect the school's fragmented open spaces. Also, many of these "leftover spaces" are located near the site's edges. This location of the site is most accessed by the public—thereby promoting the need for the "leftover spaces" to be incorporated into the Outdoor Learning Environment as a community resource. By making the site a community resource, the development of these "leftover spaces"— and the Outdoor Learning Environment as a whole—is more meaningful and, therefore, more worthy of implementation.

Developing a Design Framework

Though site analysis determined important goals for the design of Garfield Elementary School's Outdoor Learning Environment, it did not offer insight into the specific aspects of nature that are necessary to promote the establishment of a bond between children and nature. The works of Carles Broto, Julie Moir Messervey, and Rusty Keeler provided this insight.

Carles Broto, in his book *The Complete Book of Playground Design*, asserts that children will develop holistically if they are offered opportunities to experience five types of outdoor learning activities: physical, creative, sensorial, solitary, and social. Therefore, it is my assertion that by designing a variety of nature-focused spaces to accommodate for these outdoor learning activities in the Garfield Elementary School Outdoor Learning Environment, children will be given increased and diversified opportunities to connect with nature. (See the What is Nature? section of this book on page 10.)

Julie Moir Messervey in her book, *The Inward Garden: Creating a Place of Beauty and Meaning*, describes seven land archetypes that offer the spatial variety needed to accommodate for Carles Broto's outdoor learning activities. The land archetypes mentioned in her book are: sea, cave, harbor, promontory, island, mountain, and sky. These land archetypes are important to include within the Garfield Elementary School Outdoor Learning Environment because they can help promote students to engage in Carles Broto's outdoor learning activities—which can ultimately encourage students to bond with nature.

Spatial environment variety alone, however, is not enough to inspire this bond. Specific elements of nature must be incorporated into the site as well. Rusty Keeler in his book, *Natural Playscapes: Creating Outdoor Play Environments for the Soul*, describes specific elements of nature that children find fascinating. These elements include hills, water, plants, sunflowers, pathways, sand, stages, artwork, sound, hideouts, open areas, seating, and gardens.

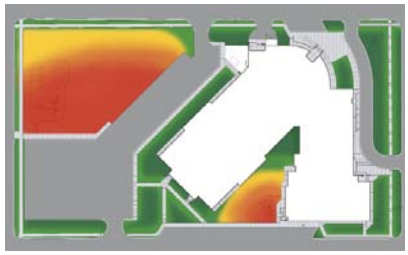
However, it is the holistic experience of interacting with both the land archetypes and their components (elements of nature) that strengthens the Garfield Elementary School Outdoor Learning Environment's potential to create lasting memories in students. It is my assertion that by incorporating Rusty Keeler's elements of nature within Julie Moir Messervey's spatial environments, Carles Broto's five outdoor learning activities will be accommodated for in the Garfield Elementary School Outdoor Learning Environment—thereby accomplishing my design goal of offering children heightened opportunities to bond with nature.

Outdoor Learning Activities Site Analysis

According to Carles Broto, the types of outdoor learning activities that children need for holistic child development are physical, creative, sensorial, solitary, and social—which has both physical and non-physical aspects. (Refer to Table 3.36 on page 80 for a description of the movements and spaces associated with each outdoor learning activity). It is important to determine if and where these activities are being currently offered onsite in order to accommodate for them in the proposed Outdoor Learning Environment design.

Physical

Physical activity offers children opportunities to interact with a space through large movements that raise the heart rate. The stationary play equipment and large grassy soccer field areas are currently the only spaces on the Garfield Elementary School site offering children the opportunity for physical activity. Moderate amounts of physical activity are afforded on the blacktop activity area of the site. The site's "leftover spaces" offer no opportunity for physical play because they are not large enough for physical activity to take place.

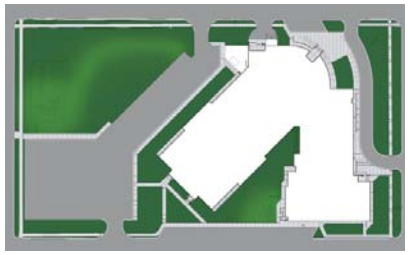


least suitable ⟷ *most suitable*

Figure 3.28—Physical Activity
Current site suitability for physical activity

Creative

Creative activity is characterized by offering children opportunities to interact with loose parts[2]. The entire site currently provides only moderate-low encouragement for creative play to occur. Although the grass from the turf lawn does offer students the opportunity to interact with loose parts such as the grass blades, there is no material variety. No water, no sand, no plant parts (other than grass) are available to for interaction—limiting opportunities for creative play to occur onsite.

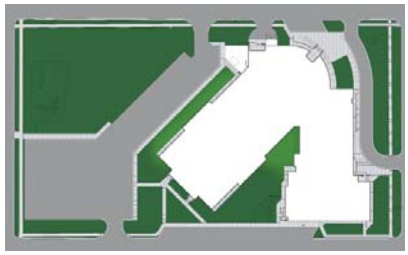


least suitable ⟷ *most suitable*

Figure 3.29—Creative Activity
Current site suitability for creative activity

Sensorial

Sensorial activity is characterized by offering children opportunities to interact with spaces that motivate the awareness and usage of all senses. The school grounds currently provide little encouragement for sensorial play to occur because of the site's limited textural variety. Therefore, the only spaces that offer varying sensory experiences are the more shaded site areas. These shaded spaces could make children more aware of sight and touch by offering lighting and temperature differences from the remaining site areas—thus resulting in a moderate-low rating for sensorial activity suitability.

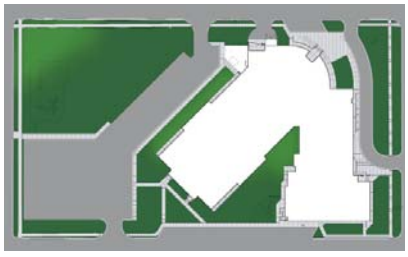


least suitable ⟷ *most suitable*

Figure 3.30—Sensorial Activity
Current site suitability for sensorial activity

Solitary

Solitary activity is characterized by offering children opportunities to interact with spaces in ways that promote reflection or contemplation. Such spaces often rely upon seclusion and therefore need small spaces in order to occur. As much of the school site is essentially a wide open expanse, the most suitable area for encouraging solitary activity is the OWLS area. However, even this space is too large and open to offer more than a moderate-low suitability rating for encouraging solitary activities in Garfield Elementary School students.

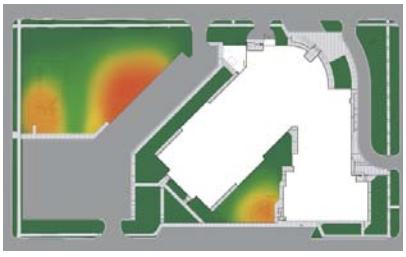


least suitable *most suitable*

Figure 3.31—Solitary Activity
Current site suitability for solitary activity

Physical-Social

Physical-social activity is characterized by offering children opportunities to experience spaces that promote peer interaction through physical movement. Much like physical play, the most suitable areas for the physical-social form of play to occur are the stationary play equipment and large grassy soccer field areas. Children can interact with one another in these substantial outdoor spaces and have enough room to perform the large movements associated with physical activity such as running. Also, opportunities for moderate amounts of physical-social activity are offered on the blacktop activity area of the elementary school site. Physical activity is slightly less encouraged on the asphalt surface because injuries are more likely to occur on the hard surface than on the nearby grass field areay l activity isnesess encouraged on the asphalt surface because injuries are more likely to occur on the hard surface than .

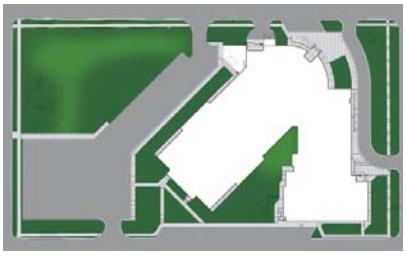


least suitable *most suitable*

Figure 3.32—Physical Social Activity
Current site suitability for physical social activity

Non-Physical Social

Non-physical-social activity is characterized by offering children opportunities to experience spaces that promote peer interaction through creative or imaginative activities. To encourage students to experience non-physical-social activity on the school site, it is necessary to offer the children access to spaces that have loose materials (such as sand or water) or encourage sensory experiences. Currently, the opportunities for non-physical-social activity on the Garfield Elementary School grounds are extremely limited. Only the shaded OWLS area and second earth terrace bordering the soccer field area offer students spatial variety that is large enough to accommodate for non-physical-social activity to occur. And even these spaces are limited in their ability to stimulate students' experience of the outdoor activity because of their current bland state of being as turf areas.



least suitable *most suitable*

Figure 3.33—Non-Physical Social Activity
Current site suitability for non-physical social activity

Current Lack of Activity Diversity

Currently, Garfield Elementary School's outdoor activity areas do not encourage students to engage in a range of outdoor learning activities. The reason for this lack of stimulating activity space is that the school grounds consists of solely two stationary equipment areas—one of these is located in the Early Childhood/Kindergarten activity area and the other in the 1st through 5th Grade activity area. Remaining site areas are composed of topsoil planted to turf, severely limiting the outdoor learning activities available to students. Physical activity is the only outdoor learning activity offered to Garfield Elementary School students at more than a "low" or "moderate" scale of spatial environment stimulation. Therefore, a variety of spatial environments must be created on the Garfield Elementary School site in order to offer students access to places that will stimulate them to experience all of the activities needed for holistic development in the Outdoor Learning Environment.

Table 3.34 Outdoor Learning Activity Descriptions

Physical *—Characterized by interacting with spaces in ways that inspire movement*

Activities: running, jumping, climbing, crawling, sliding, cycling

Spaces associated with physical activities: fields, hills, moguls, trees, play equipment, paths, and organized sports arenas

Creative *—Characterized by interacting with spaces in ways that inspire imagination*

Activities: building, molding, designing, and otherwise playing with loose parts such as sand, grass, gravel, clay, and water

Spaces associated with creative activities: sensorial, textural, and interactive spaces that give children the opportunity to build or create; areas with water; an art display area

Sensorial *—Characterized by interacting with spaces in ways that motivate awareness and usage of all human senses*

Activities: seeing, hearing, tasting, touching, and smelling

Spaces associated with sensorial activities: spaces offering a variety of textures, plants, and spatial qualities that focus on the usage of different senses

Solitary *—Characterized by interacting with spaces in ways that promote reflection or contemplation*

Activities: introspective thinking, reflecting, imagining, role-playing

Spaces associated with solitary activities: spaces that are more secluded like burrows or coves; small imaginative spaces

Social *—Characterized by interacting with spaces in ways that promote play with others*

Physical *Interacting with others in ways that induce physical movement and raise the heart rate*

Activities: chasing, hiding, racing, playing organized sports

Spaces associated with physical social activities: fields, play equipment, hills, a forest

Non-Physical *—Creatively or imaginatively interacting with others*

Activities: role-playing, imagining

Spaces associated with non-physical social activities: huts, moguls, ridge lines, coves or a variety of other spaces that inspire the use of imagination

Table 3.34—Outdoor Learning Activity Descriptions
Children need access to all five outdoor learning activities in order to develop holistically

Land Archetypes

Land Archetypes Accommodate for Outdoor Learning Activity Variety

Julie Moir Messervy's land archetypes from her book The Inward Garden: Creating a Place of Beauty and Meaning can be incorporated in the Garfield Elementary School site to offer students opportunities to participate in the outdoor learning activities, defined by Carles Broto, not currently offered onsite. These land archetypes include the sea, the cave, the harbor, the promontory, the island, the mountain, and the sky. She asserts that people are instinctually attracted to these landforms and experience heightened emotions in such spaces.

I have redefined Messervy's land archetypes utilizing landform classifications that can be found in Kansas. The meadow represents the sea; the burrow represents the cave; the cove represents the harbor; the bluff represents the promontory; the outcropping represents the island; the cuesta represents the mountain; and the sky classification remains the same. (Refer to Table 3.37 on page 82 for a spatial description summary and to *Appendix B* for sketches of each land archetype.)

Each of these land archetypes encourage students to participate in multiple outdoor learning activities. (Refer to Table 3.38 on page 82 for a list of the outdoor learning activities that are associated with each land archetype.) By incorporating each of these land archetypes into the Garfield Elementary School grounds, all the activities necessary for children's holistic development will be accommodated onsite. The inclusion of these features in the cohesive layout of Garfield Elementary School's Outdoor Learning Environment provides students with increased opportunities to develop a bond with nature.

To offer students increased opportunities to connect to nature, the proposed site design offers students access to a range of activities via incorporation of the land archetypes. Such spatial variety has great potential to encourage the school's students, who have a range of interests, to utilize and enjoy the school's outdoor spaces. The inclusion of spatial variety onsite can potentially impact a larger number of Garfield's students than would exposure to limited spatial variety. This increased potential is a result of students' individuality—each individual student is attracted to different aspects of nature. Therefore, by incorporating a wider range of natural features onsite, more opportunities are available for individual students to be emotionally drawn to an aspect of nature that can lead to the development of a human-nature bond.

Table 3.35 Land Archetype Descriptions

Meadow
the feeling of being immersed in a space

Burrow
the feeling of being enclosed on all sides with a small view outward

Cove
the feeling of having one's back protected with views outward; less enclosed than the burrow

Bluff
the sensation of standing on a raised edge while overlooking surrounding lands

Outcropping
the sensation of standing on a raised object or landform that juts out from the surrounding space

Cuesta
the sensation of standing on a high place that offers expansive views of surrounding lands

Sky
the sensation of vertical movement through space; the feeling of flight or effects of gravity

Table 3.35—Land Archetype Descriptions
People are attracted to these land archetypes which represent Kansas environments

Table 3.36 Land Archetypes Encourage Outdoor Learning Activities

Land Archetypes	Outdoor Learning Activities				
	Physical	Creative	Sensorial	Solitary	Social
Meadow					
Burrow					
Cove					
Bluff					
Outcropping					
Cuesta					
Sky					

Table 3.36—Land Archetypes Encourage Outdoor Learning Activities
The seven land archetype accomodate for all the outdoor learning activities necessary for holistic development

Incorporating Elements of Nature

Each of the land archetypes, or ecosystems, is comprised of elements of nature (flora, fauna, and avifauna). These biotic species further express the diversity found within each land archetype. Therefore, Garfield students who interact with the land archetypes will also be able to interact with biotic species comprising them. Interaction with this large variety of biotic species also gives children many opportunities to develop a bond with nature. “Nature is certainly well-endowed with fascinating objects, as well as offering many processes that people find engrossing” (Kaplan, 1995, 174). It is my hope that some part of the vast store of nature offered within the land archetypes incorporated onsite will have a lasting emotional impact on Garfield’s students.

Rusty Keeler, in his book Natural Playscapes: Creating Outdoor Play Environments for the Soul, describes specific elements of nature that should be included within every outdoor learning environment for children. Keeler’s list of natural elements include: hills, water, plants, sunflowers, pathways, sand, stages, artwork, sound, hideouts, open areas, seating, and gardens. He asserts that children are instinctually attracted to the emotional qualities provided in these elements. Therefore, the incorporation of these elements significantly augments the potential of a place to inspire a bond between children and nature to occur.

Hills

Hills are equivalent to the cuesta land archetype. The spatial experience offered on a hill is the sensation of standing on a high place that offers expansive views of surrounding lands. Children are able to feel tall and powerful on these landforms. The ability to observe is also strengthened from the tops of hills—thereby increasing local awareness of nature and place.

Figure 3.37—Hills
The rolling hills of Tuscany, Italy

Figure 3.38—Water
Pristine blue water in Capri, Italy

Water

Water is probably considered universally to be the most fascinating element of nature. Children are drawn to interact with water—to discover its properties. By integrating water on the school grounds, children are able to experience a fun and stimulating part of nature that motivates further discovery and experimentation. Water strengthens children's interest in nature.

Figure 3.39—Plants
Flowers in Orvieto, Italy

Plants

Plants also provide children with loose parts to interact with. The various shapes, forms, and colors of vegetation also add interest and diversity to the outdoor environment. Children are inherently attracted to these parts of nature and their temporal qualities; plants are alive and change with the passage time—the ever-transitioning seasons. Native plants are especially important to incorporate in outdoor learning sites because they express local nature to children—increasing student appreciation of the local habitat.

Figure 3.40—Sunflowers
Summer sunflowers in Manhattan, KS

Sunflowers

Not only are sunflowers the state flower of Kansas, they are low maintenance native plants that grow quickly. Sunflowers change dramatically over the growing season, thereby exposing children to the vast changes that occur seasonally in the natural environment.

Pathways

Pathways are incorporated onto a site to direct movement through space—and can be instrumental in guiding the experiences people have in a space. Nevertheless, one of the most important traits of paths is that they promote choice. Children are able to choose the manner in which they will move through a space by selecting different pathways or by opting not to follow a path at all. Paths also increase mobility to all students by providing ADA access throughout the site.

Figure 3.41—Paths
Paved pathway in Topeka, KS

Sand

Sand varies the textures offered onsite by giving children exposure to a coarseness or grittiness that contrasts with the smoothness of water. This textural variety makes sand a great material to inspire children to participate in creative outdoor learning activities such as modeling or molding.

Figure 3.42—Sand
Fine-grained sand in South Padre, TX

Stages

A stage can be equated to the outcropping land archetype because of the similar experiential value that both forms encourage. The outcropping is the sensation of standing on a raised object or landform that juts out from the surrounding space. Like the cuesta, the outcropping augments a child's sense of importance and self-confidence. However, the outcropping's closer proximity to level ground promotes a connection to the surrounding area that is similar to a stage performer's connection to an audience. In order for stages, or outcroppings, to be considered useful in motivating children's awareness of nature, they must utilize natural materials as their more basic elements of composition—such as a boulders or logs.

Figure 3.43—Stage
Performance platform in Topeka, KS

Figure 3.44—Artwork
Garden art in Kansas City, MO

Artwork

Artwork gives visual expression to emotions and thoughts. And if art pieces are used to interpret themes of nature, then it can be especially powerful in stimulating children to experience an increased awareness and emotional connection to the natural environment. The potential for art to strengthen the bond between children and nature lies in the fact that art itself represents the human relationship to nature as people reinterpret aspects of nature to create art. A variety of user groups can participate in the creation of artwork onsite, but students should be able to either aid in the creation of the artwork or be given opportunities for interaction with the pieces.

Figure 3.45—Sound
Tube chimes in Topeka, KS

Sound

Sound adds sensory dimensionality to an outdoor learning environment. From plants to outdoor musical instruments to noise makers, the presence of varying sound qualities in a site can increase children's awareness of the outdoor environment—and thereby encourage an intensification in students' emotional connection with local nature.

Figure 3.46—Hideout
Tunnel hideout in Topeka, KS

Hideouts

Hideouts can be redefined as the burrow land archetype. The burrow landform induces the sensation of being enclosed in a small space on all sides with a narrow view outward. Children can conceal themselves in these spaces and feel protected, safe, disguised from the outside world. Hideouts, or burrows, can be constructed so as to offer zen views into the space for teacher observation.

Open Areas

Open areas are equivalent to the meadow land archetype. These spaces inspire children to feel the sensation brought with being immersed in a space. Forests, fields, and pools all create this sensation. Children often feel small yet free within such spaces and, therefore, utilize these areas as places for organized sports or other forms of physical activity.

Figure 3.47—Open Space
Grassy lawn in Topeka, KS

Seating

Seating areas encourage human comfort in an outdoor environment, welcoming reflection, introspection, and observation. People are often at peace or are seeking peace when they choose to occupy these outdoor places of rest. Seats, then, can be thought of as symbols of serenity. By incorporating seats within an outdoor learning environment, their calming qualities can encourage children to feel safe and welcomed into the outdoors—which could promote the creation of a bond between children and nature on the site.

Figure 3.48—Seating
Cedar bench in Topeka, KS

Gardens

Gardens are perhaps the most effective natural element to encourage students to connect with nature. Gardens create a sense of responsibility and empathy for nature because children have to care for local nature in the form of plants. In gardens, children are given firsthand experience in environmental stewardship. “Gardening can offer the special joy of ‘participation’ with natural forces (nature) in the creation of something beautiful and more magical than could be created alone. This feeling of participation, I feel, is at the core of the fostering of earth stewardship in children” (Hart, 1995, 63). In order for children to emotionally connect to the natural environment, they must be given the opportunity to physically interact with and care for some part of nature—which gardens offer in the form of plants.

Figure 3.49—Garden
Raised planter in Kansas City, MO

Children's Literature as Inspiration

The writings of Carles Broto, Julie Moir Messervy, and Rusty Keeler provided me with the information needed to create a design framework that has guided the design development of the Outdoor Learning Environment. Through analyzing these writings, I was able to determine the specific spatial environments and elements of nature needed to create opportunities for students to conduct outdoor learning activities that can lead to their development of a bond with nature. However, an overall unifying design concept was needed to make the proposed site design cohesive. This design concept took the form of three classic environmentalist-themed pieces of children's literature: *The Lorax* by Dr. Seuss, *The Wump World* by Bill Peet, and *Where the Wild Things Are* by Maurice Sendak. I utilized the illustrative and written descriptions from three classic stories to create three conceptual spatial organization designs—one depicting each tale's storyline—on the Garfield Elementary School site. (Refer to Figures 3.50 through 3.52 on pages 97 through 99 to see the conceptual spatial organization sketches for each tale.) The conceptual designs created for each of the three stories guided the ultimate spatial organization for the final site design proposal.

The primary purpose in using children's literature to guide site design is to offer Garfield students the stimulation needed to emotionally connect to the Outdoor Learning Environment. Clifford R. Blizard and Rudy M. Schuster, in their journal article *Fostering Children's Connections to Natural Places through Cultural and Natural History Storytelling*, assert that "Such imaginative engagement might further heighten children's construction and appreciation of the place's meanings, particularly those pertaining to the historical dimension of sensing place" (2007, 196). This cognitive stimulation, in partnership with the physical stimulation (offered by the land archetypes and elements of nature) significantly increases the site's potential to inspire students' emotional connection to nature. The dualistic stimulation increases the Outdoor Learning Environment's effectiveness in creating a bond between children and nature by targeting both the mental and physical learning capacities.

The incorporation of the emotive qualities expressed in children's literature also makes the site more relatable to students. "Natural history stories enhance direct engagement (between children and nature), promoting place meanings that are biocentric, creative, and less restricted by site boundaries" (Blizard, 2007, 171). This feeling of familiarity is especially important to develop on the outdoor learning site because an awareness and understanding of the outdoor environment is necessary even before an emotional connection can be established. In order for the site to have the desired effect of fostering a bond between children and nature, children must first understand the

elements of nature that are included within the site. They must develop an emotional connection to the spatial environments provided onsite. Story-telling in an outdoor site "makes children more aware of positive and negative human impacts to the land....and may encourage children to engage with places creatively, constructing place meanings based upon their discoveries" (Blizard, 2007, 194-195). The children's books *The Lorax, The Wump World,* and *Where the Wild Things Are* can be used to create this familiarity and understanding of nature in Garfield's Outdoor Learning Environment.

The ability of each of these stories to emotionally connect to children is demonstrated by their popularity. *The Lorax*, *The Wump World*, and *Where the Wild Things Are* are stories have been demonstrated to be emotionally significant to generations of children. *The Lorax* alone has sold over 1.6 million copies (Stallard, 2012) and *Where the Wild Things Are* has sold over 19 million (Turan, 2009).

Children's Literature Analysis

To utilize the children's stories as design inspiration, I first analyzed the book text and illustrations to determine the specific components that connected to human emotion regarding the environment. It is my assertion that a combination of both the specific imagery and the written descriptions used in children's literature trigger youths' concern for nature. The wondrous Truffula Tree forest and the place where the wild things live capture the imagination of the reader and inspire a tone of excitement. While the polluted Wump World and melancholy of the "Unless" rock left remaining in *The Lorax* provide the reader with a sense of sadness. Understanding the simplicity of the drawings and descriptions provided in these tales is valuable in determining the visual imagery that is interesting to children—especially considering that these spatial environments can be re-interpreted in outdoor places to create a bond between children and the natural world.

Several common themes can be found in these books. Two of these stories, *The Wump World* and *The Lorax* express mankind's callous misuse of nature as an unlimited resource—with the suffering of all biotic species as a result. The irony of such maltreatment, as expressed in the stories, is that people rely upon nature for survival. Therefore, the moral of these stories is that people need to protect the natural resources available in order to ensure their survival. Nature is resilient to human environmental degradation, but only to an extent.

In *The Lorax* and *The Wump World*, nature suffers from large scale degradation at the hands of insensitive, consumption-oriented human beings. And in both of these tales, the environment is so severely degraded that even the non-human species dependent upon the nature suffered. The Swomee—Swans, Brown bar-ba-loots, and the humming fish from *The Lorax* and the wumps from *The Wump World*, which had long lived in a symbiotic relationship with the natural world, were all forced to retreat from their natural habitats. These species were forced from their homes by humans (or humanoid creatures). The humanoids had over-exploited the natural environment to the extent that it no longer supported any living creatures. Even the human-like creatures of each tale were forced to leave as a result of their misuse of the environment.

Nature's resilience is also referenced within *The Lorax* and *The Wump World*. The Onceler tells the boy at the end of *The Lorax* that he can make a difference if he cares enough about nature. Such words of wisdom invite young readers to make a difference—to become environmental stewards and fight for humans to make ecologically-considerate decisions. And Bill Peet, author of *The Wump World*, writes that nature is resilient—that it can rejuvenate itself from both degradation and pollution. However, he cautions that there will always be scars. There is no way to completely undo all of the changes that humans have made to the natural world—though these environmental harms can be lessened in their severity if people take action and encourage biological remediation.

Where the Wild Things Are demonstrates children's love of wildness. Max, a rambunctious young boy, wreaks terror in his play within the family house. But when Max is later sent to his room because of his rough-housing, he imagines himself in nature—in a wild place—and he is free and happy. The story emphasizes that people rely upon nature for survival, but they also depend upon it for happiness and health.

The Lorax

The Lorax is a tale of natural tragedy. In this story, the Once-ler comes to the Truffula Tree forest and is inspired by their beauty and the wondrous environment that they create. "All my life I'd been searching for trees such as these. The touch of their tufts was much softer than silk and they had the sweet smell of fresh butterfly milk. I felt a great leaping of joy in my heart" (Seuss, 1999, 16). Yet, he is not satisfied with merely observing the beauty of nature; the Once-ler feels that he must somehow own the trees or make them more useful. So he began chopping down these beautiful trees that provided habitat for the Swomee—Swans, Brown bar-ba-loots, and the humming fish in order to make worthless human goods called "thneeds."

Despite their apparent lack of worth, the Once-ler creates a business of making thneeds by chopping down the trees in the Truffula forest. This results in a lessening of habitat for the other species relying upon the trees for survival. And in spite of the warnings from the Lorax (a little creature that symbolizes the human conscience) for the Once-ler to cease his unethical treatment of the environment, the Once-ler maintains his destructive path of Truffula Tree harvesting. He does not see the environmental impact that his removal of the trees has on the Truffula forest or on the other animals dependent upon the forest.

One by one each of the animal species is forced to leave the Truffula forest due to lack of food or pollution created by the thneed-making machines. The Once-ler feels saddened, but does not see that he has been the direct source of the devastation. Blinded by his greed for monetary profit, the Once-ler destroyed all that was once beautiful and pristine—the Truffula Trees that he loved. The once fantastical Truffula Tree forest had been transformed into a disgusting, dark, dingy, smog-filled place. The haunting end to The Lorax consists of the Once-ler giving a young boy the very last Truffula Tree seed with the words, "Unless someone like you cares a whole awful lot nothing is going to get better, it's not" (Seuss, 1999, 58). The Lorax offers a Truffula Tree seed of hope at the tale's end—allowing readers to believe that change is an option. People can modify their behaviors to establish a more symbiotic relationship with the natural environment.

The Wump World

The Wump World by Bill Peet, though less well known than *The Lorax* and *Where the Wild Things Are*, is another favorite piece of children's literature with an environmental-conservation theme. In this tale, the Wumps are peaceful creatures living on the Wump World. The Wumps lived a peaceful existence eating the "tall tender grass that grew in the meadows," "cooling themselves in the crystal-clear rivers," and "sleeping at night in the shelter of the bumbershoot trees" (Peet, 1970, 2). These descriptions allow child readers to see that the world is perfect as is—nothing needs to be changed to make it better.

Yet, this peace did not last because the Pollutians arrived. "They had left their worn-out planet to start a new life in a new world" (Peet, 1970, 6). (The Pollutians are human-like in both actions and appearance, which allows the readers to see that Bill Peet is creating an analogy between humans and the Pollutians. The current relationship between people and Earth is one of exploitation of natural resources—eerily similar to the relationship that the Pollutians had with their planet Pollutus. Such actions ultimately led to their planet's destruction; it became so severely polluted that it was uninhabitable.) The first thing the Pollutians did was overrun the clean pristine Wump World with buildings, skyscrapers, highways, and smog; they were "improving"

the planet and making it more livable. While there planet was being essentially trashed by the Pollutians, the Wumps hid in underground caverns “feeding on the fuzzy green moss growing on the ledges and the mushrooms clustered in the crannies, and sipping the sweet water from pools fed by underground springs” (Peet, 1970, 22). However, the Wumps were unhappy; they missed the meadow grass, the rivers, and the bumbershoot trees.

Ultimately, “the cities were so clouded by the factory smoke and the fumes from the freeways that the Pollutians could barely breathe” (Peet, 1970,26). Rather than altering their behavior in an attempt to fix the environmental problems that they had created on Wump World, the Pollutians simply scouted out a new planet and moved to it—leaving behind the severely polluted Wump World for the Wumps to deal with. The Wumps, upon hearing the silence, left the caverns to see what had become of their world.

“The Wumps gaped in wide-eyed amazement. They had feared something awful was happening to their world but this was much more than they could have imagined. They were staggered by the size of the huge buildings with walls and walls of windows looming up on every side, and the broad layers of hard, flat crust covering the earth which felt strangely cold to their feet. There was no sign of any tree or tuft of grass. Even the sky was gone. And the Wumps wondered if there was anything left for them” (Peet, 1970, 39).

The sadness felt by the Wumps in this part of the tale is immense—and passes on to the reader as well. Seeing their downtrodden faces, readers can’t help but be furious with the Pollutians for destroying the serene planet and its pristine habitat upon which the Wumps survived. The peaceful Wumps gain the readers’ sympathy as they search for a trace of their planet unaffected by corruption. All readers are rooting for the Wumps to succeed—to find their beloved meadow grass and bumbershoot trees once again. And there is a spark of joy when the Wumps do find a small patch of land unharmed by the Pollutians. “Just ahead of them was a grassy meadow with a clump of bumbershoot trees, all that was left of their lovely world….Now there was new hope for the Wumps” (Peet, 1970, 42).

Much like the ending in *The Lorax*, there is a spark of hope that hints at the resilience of nature in *The Wump World*. The patch of unharmed nature remaining in the Wump World represents hope like the last Truffula Tree seed in *The Lorax*. Nature can rejuvenate itself if given the opportunity. But once purity is lost, it can never again be fully regained. There will always be visible scars on the land and a human conscience that is aware of the negative impacts of mankind’s land management malpractice. These scars can fade with time and good thoughts of hope can gradually replace guilt, but they will always be present.

This melancholy message allows readers to see that change can be enacted to benefit the environment and give all species present on the Earth a brighter future, but our past actions have long-lasting effects that can never be forgotten.

“In time the murky skies would clear up and the rains would wash the scum from the rivers and lakes. The tall buildings would come tumbling down and the freeways would crumble away. And in time the green growth would wind its way up through the rubble. But the Wump World would never be quite the same” (Peet, 1970, 44).

Where the Wild Things Are

Where the Wild Things Are by Maurice Sendak is slightly different from *The Lorax* and *The Wump World* in that it does not have an outright environmentalist theme. This tale does not speak of humans’ misuse of the Earth. Rather, it hints at children’s need for opportunities to play in nature—in a place where wild things are. The book expresses that nature is a powerful stimulus for children; it encourages them to access and utilize their imagination—which promotes healthy cognitive development.

At the beginning of the story, a young boy (Max) is playing in the house, but in the mean-spirited manner of a naughty child. “The night Max wore his wolf suit and did mischief of one kind and another” (Sendak, 1963, 1). He pestered the dog and strung up his stuffed animals from the ceiling. Max talked back to his mother so she sent him to bed without supper.

In his room, Max imagined a dense tropical forest coming to life. He went to the edge of this forest and sailed across the ocean to the place where the wild things are. “And when he came to the place where the wild things are they roared their terrible roars and gnashed their terrible teeth and rolled their terrible eyes and showed their terrible claws” (Sendak, 1963, 17). But Max was not scared by the wild things. He looked deep into their yellow eyes without blinking “and they were frightened and called him the most wild thing of all and made him king of all the wild things” (Sendak, 1963, 20). Children should not have unreasonable fears for being outside. They should want to be outside and to interact with the wild.

Max played with the wild things in the wild rumpus, but soon he missed his home, his mother, and her cooking. So he sailed back across the ocean and returned to his room that was no longer a forest. He was once again home and he was happy. *Where the Wild Things Are* expresses the need for children to return to the natural world. Not only does outdoor exercise help kids be more passive and focused during indoor activities, but it strengthens children's connection to nature. A stronger bond with nature would perhaps create a civilization of more environmentally concerned citizens. Such a generation could prevent our Earth's suffering from devastating environmental impacts as expressed in *The Lorax* and *The Wump World*.

Understanding Children's Literature

All three of these tales demonstrate the importance of nature in our lives. And they describe the human-nature relationship in terms that children can understand. But even more significant than conveying understanding of environmental problems to children is the emotional attachment to nature that *The Lorax*, *The Wump World*, and *Where the Wild Things Are* inspire in youthful minds. In analyzing the visual imagery and language utilized in these literary pieces, I hope to have been able to think more like a child. To discover the elements of nature that trigger children's sense of pathos is to determine the spatial and programmatic elements necessary for the creation of a meaningful outdoor learning environment within Garfield Elementary School's site boundaries.

Applying Literature to Site Design

The Lorax

Spatial environments depicted in the conceptual site design sketch for *The Lorax* include: a Truffula Tree Art Walk, a Re-growth area, a Hope Garden, Butterfly Milk Garden, a Seeds of Hope Garden, Unless Mountain, two Truffula Tree Forest areas, a Meadow, the Gluppity Glup outdoor classroom, the Onceler Destruction Garden, the Onceler's House, the Humming Fish Pond, the Home of the Swomee—Swans area, a Welcome to the Forest entry seating area, and a Color Garden. (Refer to Figure 3.52 below to see the spatial organization derived from the conceptual design sketch for *The Lorax*.) These spaces give physical actualization to the habitats created in *The Lorax*. Combined with the conceptual design layouts created for *The Wump World* and *Where the Wild Things Are*, the conceptual design for *The Lorax* influenced the final site organization of the land archetypes and elements of nature to be included within the Garfield Elementary School Outdoor Learning Environment.

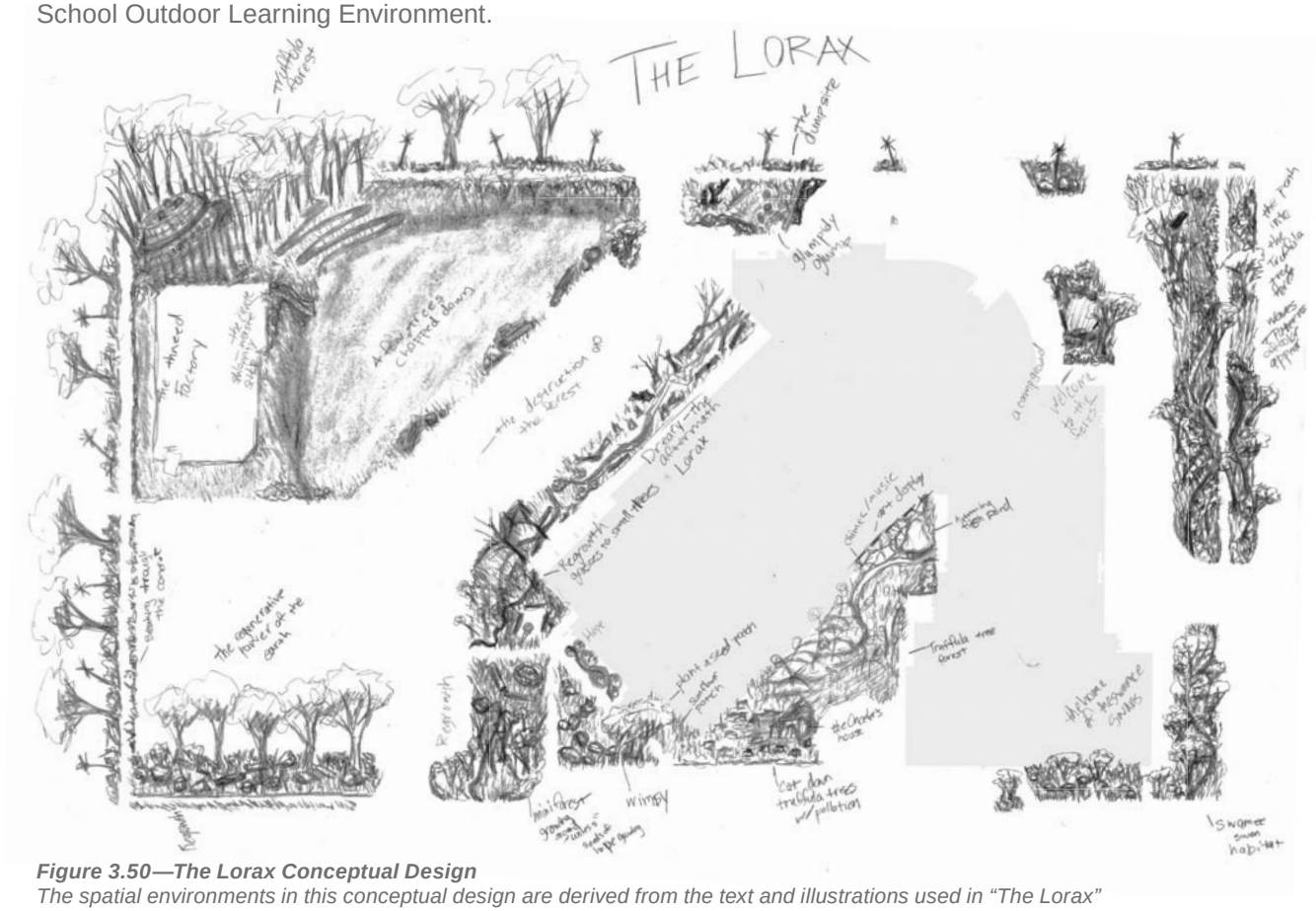


Figure 3.50—The Lorax Conceptual Design
The spatial environments in this conceptual design are derived from the text and illustrations used in "The Lorax"

The Wump World

Spatial environments depicted in the conceptual site design sketch for *The Wump World* include: a Bumbershoot Tree Art Walk, a Conquering Mound, two Bumbershoot Tree Forest areas, a Grassy Meadow, a Re-growth area, a Fire Garden, a Grassy Butterfly Garden, a Moss Garden, a Pollutian Spaceship Play Station, two Sand Dune areas, a Crystal Clear Water Pond, a Toadstool Seating Area, a Friends of the Wumps Habitat area, a Sound Garden, and an Entry Flag Mound. (Refer to Figure 3.53 below to see the spatial organization derived from the conceptual design sketch for *The Wump World*.) These spaces give physical actualization to the habitats created in *The Wump World*. Combined with the conceptual design layouts created for *The Lorax* and *Where the Wild Things Are*, the conceptual design for *The Wump World* influenced the final site organization of the land archetypes and elements of nature to be included within the Garfield Elementary School Outdoor Learning Environment.

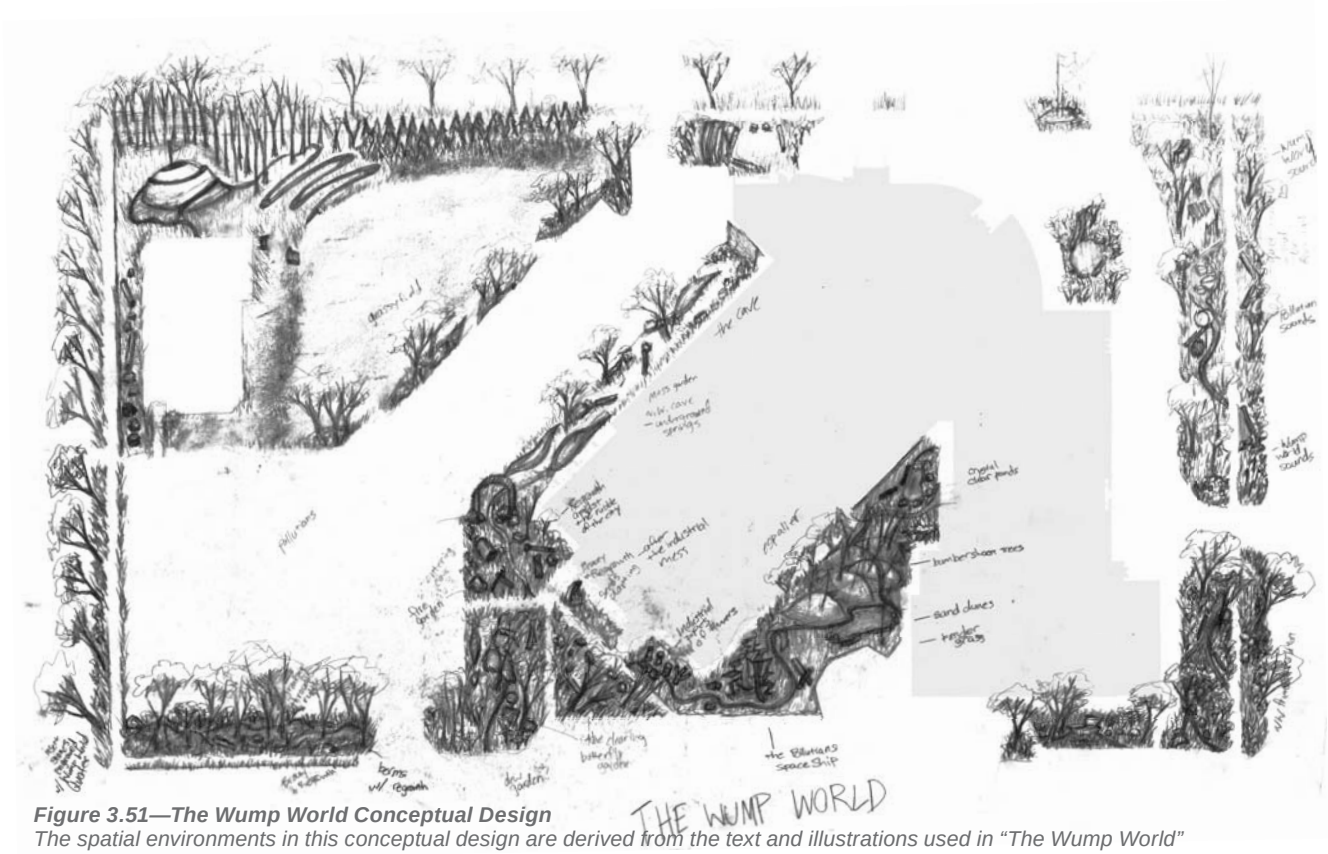


Figure 3.51—The Wump World Conceptual Design
The spatial environments in this conceptual design are derived from the text and illustrations used in "The Wump World"

Where the Wild Things Are

Spatial environments depicted in the conceptual site design sketch for *Where the Wild Things Are* include: a King's Scepter Art Walk, a Home of the Wild Things Cave Mound, two Wild Things' Forest areas, a Footprints Path, a Wild Rumpus area, a Realm of the Kings area, a Wild Garden area, a Home of the Wild Things Hut, two Sea areas, a "Forest Grew and Grew" area, a Bones of Past Kings Sand Pit, a Friends of the Wild Things Habitat for birds, a Throne Room site entrance seating area, a Wild Things Walk area, and a Flag Mound area representing Max claiming the site. (Refer to Figure 3.54 to see the spatial organization that is derived from the conceptual design sketch for *Where the Wild Things Are*.) These spaces give physical actualization to the habitats created in *Where the Wild Things Are*. Combined with the conceptual design layouts created for *The Lorax* and *The Wump World*, the conceptual design for *Where the Wild Things Are* influenced the final site organization of the land archetypes and elements of nature to be included within the Garfield Elementary School Outdoor Learning Environment.

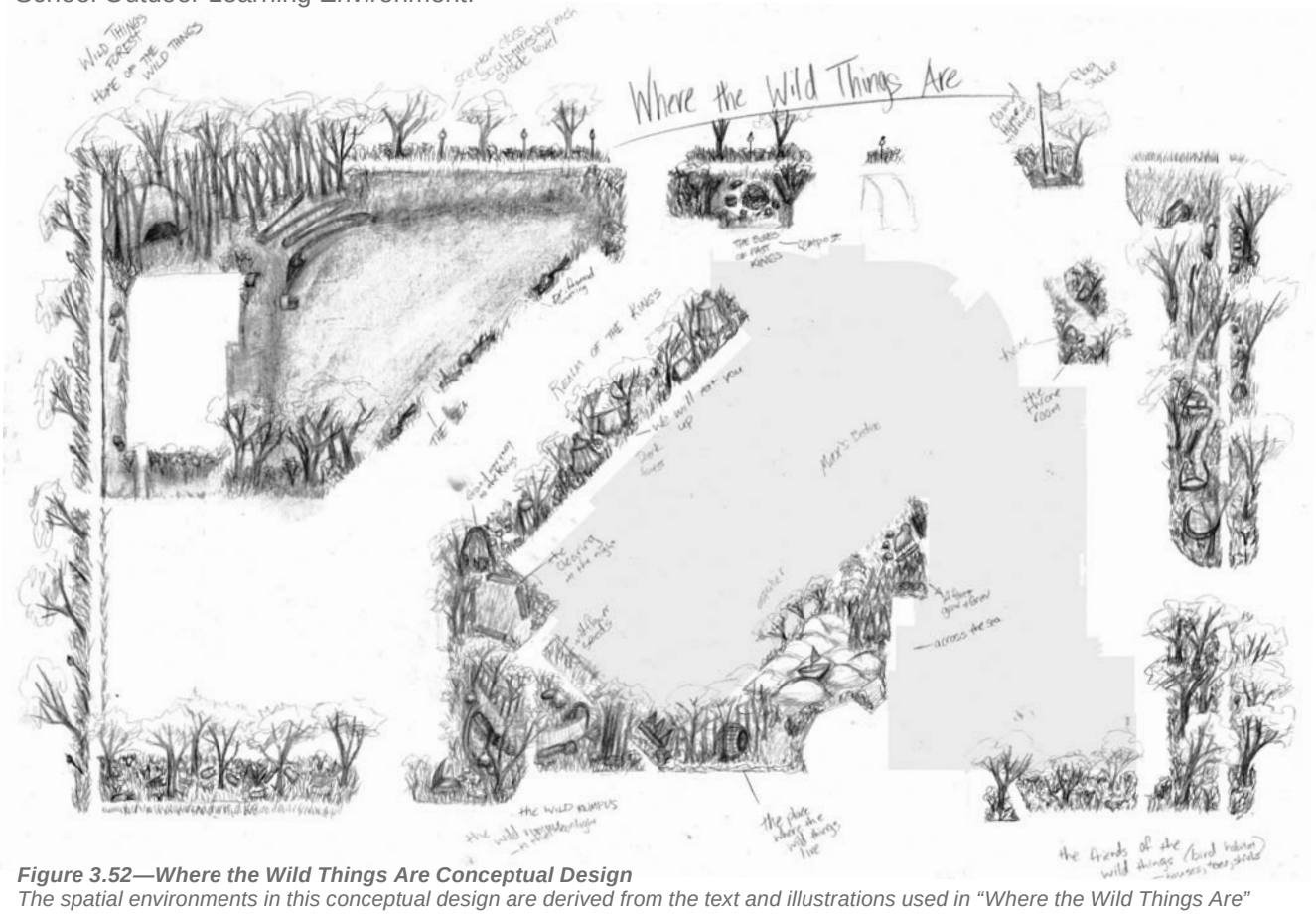


Figure 3.52—Where the Wild Things Are Conceptual Design
The spatial environments in this conceptual design are derived from the text and illustrations used in "Where the Wild Things Are"

Design Implications of Conceptual Designs

The initial design concepts created for *The Lorax*, *The Wump World*, and *Where the Wild Things Are* guided the development of a final spatial organization on the Outdoor Learning Environment. The spatial arrangements of the land archetypes and elements of nature present within each of these designs had both commonalities and differences. An analysis and comparison of the differences and similarities among the three designs informed the selection of the specific spatial environments included within the final site design. The bulleted lists below are a summary of the spatial environments selected for representation in Garfield's final Outdoor Learning Environment design.

Commonalities

Commonalities among the three conceptual designs were determined by comparing the elements of nature, landforms, and spatial organizations. Nine spatial environments were found to occur in the same site locations in all three designs. These spaces and their placements were incorporated into the final site design.

The spatial commonalities that occur within all three conceptual designs are:

- A Pond exists in the Outdoor Wildlife Learning Site (OWLS). (The Pond represents the Humming Fish Pond in *The Lorax* conceptual design, the Crystal Clear Water in *The Wump World* conceptual design, and Sea in *Where the Wild Things Are* conceptual design.)
- Moguls occur within the Early Childhood/Kindergarten outdoor learning site. (The moguls represented the hills of the Truffula Tree in *The Lorax* conceptual design, the hills in *The Wump World* conceptual design, and Sea in *Where the Wild Things Are* conceptual design.)
- A Forest area is located on the south spatial edge of the Early Childhood/Kindergarten outdoor learning site. (The Forest represents the Truffula Tree Forest in *The Lorax* conceptual design, the Bumbershoot Tree Forest in *The Wump World* conceptual design, and the *Wild Things Forest in Where the Wild Things Are* conceptual design.)
- A Forest area is located on the upper terrace north of the stationary play equipment area in the 1st through 5th Grade outdoor learning site. (Like the Forest area in the Early Childhood/Kindergarten outdoor learning site, this Forest represents the Truffula Tree Forest in *The Lorax* conceptual design, the Bumbershoot Tree Forest in *The Wump World* conceptual design, and the Wild Things Forest in *Where the Wild Things Are* conceptual design.)

- A Cuesta-like form is located in the northwest corner of the 1st through 5th Grade outdoor learning site. (This form, which I have entitled “Unless Mountain,” represents Unless Mountain from *The Lorax* conceptual design, a Conquering Mound in T*he Wump World* conceptual design, and a Home of the Wild Things Cave Mound in *Where the Wild Things Are* conceptual design.)
- A Soccer Field is located in the 1st through 5th Grade outdoor learning site. (The Soccer Field represents the Meadow in *The Lorax* conceptual design, the Grassy Meadow in *The Wump World* conceptual design, and the Sea that Max sailed across in *Where the Wild Things Are* conceptual design.)
- A Butterfly Garden is located in the “leftover space” south of the southwest school building corner. (The Butterfly Garden represents the Butterfly Milk Garden from *The Lorax* conceptual design, the Grassy Butterfly Garden in *The Wump World* conceptual design, and the Wild Rumpus area in *Where the Wild Things Are* conceptual design.)
- A Small Bird Habitat area is located in the “leftover space” south of the southeast school building corner. (This space represents the Home of the Swomee—Swans area in *The Lorax* conceptual design, Friends of the Wumps Habitat area in *The Wump World* conceptual design, and Friends of the Wild Things Habitat for birds’ area in *Where the Wild Things Are* conceptual design.)
- An Art Walk is located along the site’s perimeter on State and Osage streets. (This walk represents the Truffula Tree Art Walk in *The Lorax* conceptual design, the Bumbershoot Tree Art Walk in *The Wump World* conceptual design, and the King’s Scepter Art Walk in *Where the Wild Things Are* conceptual design.)

Differences

Differences in spatial environment locations and programmed functions were also present among the three designs. For example, the shaded "leftover space" abutting the west side of the school building was a Moss Garden in *The Wump World* conceptual design and a Realm of the Kings area in the *Where the Wild Things Are* conceptual design. When such spatial environment differences occurred, I selected the spatial environment that appeared to have the most potential for encouraging children to develop a bond with nature for incorporation in the final site design.

The spatial environments selected from differing conceptual designs to be included within the final site design are:

- A Throne Room from *Where the Wild Things Are* conceptual design is located in the "leftover space" east of the primary school building entrance.
- An Entry Flag Mound Flag Mound from *The Wump World* conceptual design is located in the small "leftover space" directly east of the school's office personnel parking spaces.
- A Toadstool Seating Area from *The Wump World* conceptual design is located in the "leftover space" north of the school building's service entry.
- A Sound Garden from The Wump World conceptual design is located in the "leftover space" on the northeast side of the site.
- A Seeds of Hope Garden from *The Lorax* conceptual design is located in the "leftover spaces" south of the southwest building corner.
- A Moss Garden from *The Wump World* conceptual design is located in the shaded "leftover space" abutting the west side of the school building.
- A Footstep Path from *Where the Wild Things Are* conceptual design is located in the "leftover space" south of the teacher parking lot.

Garfield Community Involvment in Design

In order to offer Garfield Elementary School teachers and students opportunities to be involved in the design of their school grounds, I conducted a creative design activity with the Fourth Grade students of Garfield Elementary School and gave an informal presentation of conceptual designs to the teachers at a faculty meeting. By participating in these research activities, Garfield students and teachers were able to give input into the design of their outdoor learning environment. The input from these two user groups was then incorporated into the final site design for Garfield Elementary School's Outdoor Learning Environment. The students and teachers, as a result of their participation in these studies, are very supportive of the final design that was created for their school site. Such community encouragement not only increases the likelihood that the project will be built, but also suggests that there is a presence of community pride—which would be needed to protect the site from vandalism.

A Creative Design Activity for Fourth Grade Students

Fourth Grade students' participation in the creative design activity at Garfield Elementary School resulted in the development of a more student-informed design for the school's Outdoor Learning Environment. Should the Outdoor Learning Environment ultimately be developed, there are two potential benefits of having conducted this design activity. 1) Student appreciation and desire to spend time in the Outdoor Learning Environment is significantly increased by giving students the opportunity to participate in site design. 2) By incorporating students' ideas into the design of their school grounds, the children will develop a sense of ownership over the space. This sense of ownership could potentially increase students' connection to the land, which may augment their desire to spend time in the outdoors. The more time that children spend in the Outdoor Learning Environment, the more likely is their development of a relationship—or bond—with nature.

Method

To involve children in the design of their school's Outdoor Learning Site, Garfield students built models of "fun play spaces" and described them as part of their art class curriculum. (Refer to Figure 3.53 on nex page to see an example of a student model.) This art lesson, which lasted for a one hour class period, was approved by the Garfield Elementary School Fourth Grade teachers and the Kansas State University Internal Review Board (IRB). The creative design activity took place on Thursday March 7th, 2013 from 1:00PM to 2:00PM.

Figure 3.53—Student 16 Creative Design Activity Model
This student's design is inspired by the concept of an airplane

Thirty-five students from the Fourth Grade class were asked to utilize a box of miscellaneous art supplies and tools (provided by Garfield Elementary School and the College of Architecture, Planning and Design students at Kansas State University) to design a “fun play space.” Also, a one square foot cardboard base was provided to the Fourth Grade students courtesy of the OZ Journal student organization at Kansas State University. (I used clean recycled cardboard boxes from this student organization to cut the model bases used by the Fourth-Graders in the design activity.) Model building materials utilized in the project include: feathers, markers, crayons, pencils, paper, clay, cardboard, Styrofoam, chipboard, basswood and balsawood, ping pong balls, toilet paper rolls, paper towel rolls, trace paper rolls, old Kleenex boxes, shoulder pads, pipe cleaners, yarn, and bells. Tools students used were: scissors, tape, and Elmer’s glue.

The Fourth Grade teachers and I introduced the project in the first five minutes of the class period. I described the creative exercise to the class with the instructions that the students were supposed to use the materials and tools provided to create a “fun play space” on their individual pieces of cardboard. Students had roughly 35 minutes of the hour long class to create their models. The next 10 minutes of class were spent cleaning up the classroom followed by children giving brief descriptions of their designs to the rest of the class for the remaining 20 minutes. Two tape recorders and an iPad were used to record students’ verbal descriptions of their designs. I also took hand-written notes of my observations during the student presentations. Students’ names were not recorded in the activity, preserving their anonymity. Photographs of the students’ models were taken following their presentations while they were at recess for 20 minutes. Students were able to take their models home with them—which they were very excited about!

The word playground was not supposed to be used in describing this activity to students. I considered this necessary to prevent children from incorporating stereotypical playground equipment (such as slides) merely to do what they thought would please me and their classroom teachers. There is proven research suggesting that children sometimes do not give honest responses, but rather do or say what they think adults want them to do or say. “Young children (4-7) are very suggestible, they will laugh, nod, or say yes, just to please and go-along. Also, they are often reluctant to express their own thoughts or feelings, because young children often assume that the adult knows everything already, and in addition they are afraid to say something wrong or foolish” (Borgers, 2000, 4). Therefore, it was my goal to use the description “fun play space” rather than “playground” to ensure that the children were not influenced by loaded language. This goal was not successful, although it probably did not significantly affect the results of the creative design activity.

In my description of the activity to the students, I refrained from using the word “playground.” However, it was accidentally mentioned out loud by one of the other adults in the room. This slip of the tongue might have tainted students’ model designs. However, I think that the designs altered by this slip were minimized because I countered the potency of the word by suggesting, “It doesn’t have to be a playground. In fact, what is more fun to you than a playground? What trips have you been on with your families? What places have you visited? What do you imagine would be a fun place to play in? Build a model of those spaces.”

Results

A detailed summary of the student design activity results and model photographs can be viewed in Appendix C. This section includes an image of each student’s model adjoining the associated verbal description. Summarizing this data is a comprehensive table which organizes and synthesizes the different design elements referenced by students. The results of this table are listed below.

Students were able to reference the number of design features that they incorporated into their models. Some students referenced more than five elements, spaces, or activities, while others referenced only two or three. Therefore, the reference numbers in the bulleted list below greatly exceed the number of students—which was 35—participating in the design activity. I tabulated each reference made by the students and grouped them in “umbrella groups.” The bulleted list below is a summary of the umbrella group references.

Play Equipment and Site Amenities References: 37

- 18 Traditional Stationary Playground Equipment References (such as tetherball and merry-go-rounds)
- 9 Adventure Playground Equipment References (such as zip lines and rock climbing walls)
- 10 References to site amenities (such as shade and seating elements)

Movement References: 36

- 5 Site Circulation References (such as paths)
- 7 Horizontal Movement References (such as skating)
- 24 Vertical Movement References (such as slides and ladders)

Nature References: 40

- 22 Nature References (13 of these were to water and 5 were to wildlife)
- 8 Landform References including both the mountain and cave forms
- 5 References to the senses including sight, taste, and sound
- 5 Imagination References

All three umbrella categories received relatively the same number of references—expressing the importance of including spatial environments in the Garfield site that offer students the opportunity to interact with all three elements: fixed equipment, movement, and nature. These three elements are all offered to Garfield Elementary School students in some manner within the proposed Outdoor Learning Environment Design.

Two traditional stationary playground equipment structures are already included on the school site, one in the Early Childhood/ Kindergarten Outdoor Learning Site and the other in the 1st through 5th Grade Outdoor Learning Site. The other programmatic elements students referenced are represented within the final design created for the outdoor learning site. Site amenities are provided in the form of benches and shade areas located throughout the school site. Horizontal and vertical movement opportunities are given to students in the form of pathways that connect the outdoor spaces onsite to one another and cross over a variety of landforms—from hills to valleys to slight inclines and declines. Site circulation is also enhanced by the site's pathways. Opportunities for children to interact with nature are dramatically increased in the proposed Outdoor Learning Environment Design. Water is included in the form of the OWLS pond and interactive water feature in the Early Childhood/Kindergarten sand pit area. Wildlife interaction is encouraged through the inclusion of both butterfly garden and bird habitat areas. A variety of landforms are included within the proposed site design in the form of land archetypes: the meadow, the burrow, the cove, the bluff, the outcropping, the cuesta, and sky. (Refer to *Figure 3.68—Land Archetype Locations* on page 135 location of the land archetype features on the school site.) The senses of sight, taste, and sound are accommodated onsite in the forms of varied spatial environments, the inclusion of a garden and orchard where edible plants and fruits are grown, and a sound garden. Imagination is inspired onsite by the varied spatial environment offered to students; children can reference the stories that they've read in the outdoor environments found onsite.

Preliminary Design Presentation to Garfield Staff

The teachers of Garfield Elementary School were also invited to participate in the design of the school's outdoor learning environment. This presentation, which lasted for about 30 minutes, was approved by the Kansas State University Internal Review Board (IRB). Their participation took place in the form of a brief and informal presentation in the Garfield Elementary School library at an after school staff meeting on Thursday March 7th, 2013. In the presentation, I showed the staff the three conceptual site designs inspired environmentalist-themed children's literature. (Refer to the *Children's Literature as Design Inspiration* section of this book on page 90 for a more detailed description.) These conceptual designs were based on three stories *The Lorax* by Dr. Seuss, *The Wump World* by Bill Peet, and *Where the Wild Things Are* by Maurice Sendak. The designs were each printed on a 24"x36" poster and hung on easels during the presentation. I described the concept of children's literature as the inspiration for spatial organization of the site. I then laid each poster on a different work table so that the teachers could view each design more easily. I walked to each different table and took feedback from the teachers. Markers and Sharpie pens were provided for the teachers to write comments directly on the conceptual design posters, but few did. The majority of their feedback occurred verbally.

Overall, there was a consensus of overwhelming support for the use of children's literature as the inspiration for spatial organization onsite. However, the staff wanted all of the three stories to be given physical actualization on the site. They did not want to choose just one story to guide the site design. (At the time of the presentation, I had not yet synthesized the spatial organizations represented in the different stories into one cohesive design.) Therefore, the most important feedback that I received from the teachers was that the three conceptual spatial organizations needed to be merged into one cohesive site plan that could then be used by the staff to teach their students a wider range of literature. This advice ultimately guided the creation of the site's final design. Other feedback was related to safety concerns in the use of some of the cave-like landforms represented in the conceptual designs. These landforms, as a result of the feedback given, were then reduced in number on the site and "opened up" through the provisions of zen views into the space. Teachers, as a result, would then be able to monitor student activity in the spaces—increasing student safety onsite.

Final Design

Outdoor Learning Environment

Purpose

The primary purpose in developing the Outdoor Learning Environment on the Garfield Elementary School site is to offer students increased opportunities to connect with the natural environment. In order to give children these “increased opportunities,” the final site design focuses on withdrawing children’s emotional responses to different types of outdoor learning activities through the creation of spatial environment variety. The spatial variety offered on the school site was founded on the desire to incorporate Julie Moir Messervy’s land archetypes and Rusty Keeler’s elements of nature to accommodate for Carles Broto’s outdoor learning activities. (Refer to the *Design Development* chapter of this book on page 72 for more information on this process.) Environmentalist-themed children’s literature was then used as inspiration to determine a cohesive spatial organization for the land archetypes and natural elements. The creation of a multi-functional landscape narrative on the Garfield Elementary School Outdoor Learning Environment was the ultimate result of this design process.

The landscape narrative represented within the school grounds expresses the emotional qualities found in each of the three stories used as inspiration for the site’s spatial organization. (*The Lorax* by Dr. Seuss, *The Wump World* by Bill Peet, and *Where the Wild Things Are by Maurice* Sendak are the stories that were used for design inspiration.) However, the emotional landscape that was created with the influence of these stories is not exclusively applicable to the three lone tales. A focus on the integration of emotional qualities in the landscape narrative allows the site to relate to a wider range of children’s literature. Students’ individual attractions to different stories support the need for this increased literature applicability—which, as a result, gives students more opportunities to emotionally connect to the nature found onsite through literature. For example, a student may better relate to the Moss Garden space by thinking of it as the place where the wumps hid from the Pollutians as described in Bill Peet’s *The Wump World.* Another student may consider that same space to be a cave dwelling from *Where the Wild Things Are* or a cavern used by the girl in *The Island of the Blue Dolphins*. The final site design promotes students’ connection to nature through the inclusion of spatial environments that offer a range of literary interpretations. The emotional connections that students have to their favorite stories are then translatable into the physical spaces of school site—stimulating the development of a student bond with local nature.

Spatial variety

Incorporating spatial environment variety in the school site is integral to the creation of a landscape narrative that augments children's opportunities to connect to nature through literature. Diversifying the landscape spaces offered onsite also diversifies the site's range of literary applicability. Therefore, the proposed site design focuses on the inclusion of the land archetypes (outlined by Julie Moir Messervy) and the elements of nature (outlined by Rusty Keeler) in order to offer children exposure to a diversity of local nature. The proposed outdoor learning site offers Garfield students access to a range of landforms and a variety of native plants and natural materials. These components create a series of outdoor learning spaces that emphasize the wonders of the natural world—giving children heightened opportunities to connect to the natural environment. And, since not every student is drawn to the same features of nature, it is important that such a variety of spatial qualities and materials be included in the Outdoor Learning Environment. This diversity serves as a broader foundation for connecting all of the school's children to local nature by increasing students' awareness or interest in the features of nature contained within the site.

Spatial Connectivity

It is important to note that the site's range of natural elements and spatial environments do not create a disjointed outdoor learning environment. Rather, these features are cohesively integrated into the school grounds resulting in increased spatial inner-connectivity. The inclusion of the site's "leftover spaces" and integration of paths to direct site circulation were the design methods utilized to unify the current spatial fragmentation onsite through increasing connections between the outdoor spaces. These connections enhance site circulation, thereby encouraging students to interact with the entire site and to experience the variety of spatial environments offered.

Outdoor Learning Potential

The proposed design for the Outdoor Learning Environment on Garfield Elementary School's grounds offers children a series of stimulating outdoor spaces that build upon student learning in the classroom by giving physical actualization to indoor lessons. This linkage between indoor and outdoor learning is highly dependent upon the involvement and guidance that teachers provide to their students while experiencing the school's outdoor spaces. Without teacher involvement in outdoor education, the significance of the school grounds as a resource for student learning is diminished. It is through linking classroom learning with outdoor learning that student retention and interest in subject matter will be increased.

Teachers can apply outdoor learning to all subjects of their curriculum in order to promote the significance of lessons introduced in the classroom. For example, the site can be used to bolster the reading and writing lessons in the students' curriculum. Teachers can relate the site's range of spatial environments to literary descriptions in order to strengthen student interest and retention of these readings. Children can use the spatial environments offered onsite as inspiration for settings in their own writings. Math lessons can also be applied to the outdoor learning site. Children and teachers can measure plant growth in the garden or record the number of daily garden plant sprouts in spring. Science lessons centered on biology or the processes of nature (such as the changing seasons, process of photosynthesis, or food chain) can be demonstrated more meaningfully in the outdoor school site where they are actually occurring. History can be applied through teaching students about the medicinal qualities possessed by some of the site's plants (which the Native Americans previously occupying the land originally discovered). Opportunities for Physical Education are supplied in the site's open field area and paths—which inspire student movement. Even teaching typical classroom lessons in the outdoor gathering areas can stimulate learning by increasing students' value of both the lesson being taught and the features of nature found onsite. (For more ideas and detailed descriptions of ways to incorporate outdoor learning activities into the curriculum, I recommend that each Garfield Elementary School teacher be supplied with a copy of Joseph Cornell's book Sharing Nature with Children.)

Outdoor Learning Promotes Child-Nature Bond

The Garfield Elementary School Outdoor Learning Environment—when partnered with teacher involvement in students' outdoor learning experiences—serves to stress the significance of nature to school children. Outdoor learning environments offer children real-life application to classroom lessons in the form of hands-on exploration and experimentation with nature. Children's ability to interact with nature through outdoor learning increases their appreciation for the natural environment. However, teacher involvement is necessary to encourage children to form a bond with nature. Teachers could alter their curriculum to engender the formation of such a bond by connecting indoor and outdoor learning. Through this learning fusion, the adult encouragement needed to motivate children's respect and care for nature through environmental stewardship is accomplished.

Spatial Meaning

Garfield Elementary School's Outdoor Learning Environment is grouped into seven different areas of spatial meaning: 1) Pristine Nature, 2) Conquering the Site, 3) Positive Human Impacts on Nature, 4) Negative Human Impacts on Nature, 5) the Hideout, 6) Aftermath, and 7) Re-growth. Each area of spatial meaning exists in one or more locations onsite. For example, Pristine Nature is located in all of the following areas within the school grounds: Wildlife Walk, soccer field, the Evergreen Bluff Walk, Deciduous Forest, Unless Mountain, Mogul Sea, and Orchard. The locations of each spatial meaning area were determined through consideration of both the climatic and cultural influences onsite in combination with information from three conceptual spatial organization schemes (which were derived from the three conceptual site designs based on children's literature).

The integration of these spatial meaning areas on the school grounds communicates to site users a landscape narrative. This landscape narrative expresses the human relationship with nature derived from the environmentalist-themed pieces of children's literature. (See Figures 3.55-3.57 on pages 118 and 119 to visualize the initial spatial meaning areas derived from each story which were later synthesized to form the final spatial meaning areas expressed in Figure 3.54. on page 117) Each area of spatial meaning represents a different emotional quality regarding the human relationship to nature. For example, the Conquering the Site area of spatial meaning represents human discovery and desire to dominate nature. In contrast, the Re-growth area of spatial meaning represents nature's resiliency to human alterations of the environment. All of the spatial meaning areas represent the different emotional qualities of human interaction with nature to create a diverse landscape narrative onsite. A description of each spatial meaning area is listed below.

Pristine Nature

The Pristine Nature areas of spatial meaning create emotional landscapes full of wonder and fascination. These areas depict the beauty and richness of nature prior to human discovery and alteration. A range of spatial environments represented onsite express the diversity of Pristine Nature areas. Inspiration for the Pristine Nature areas of spatial meaning is derived from the illustrations and descriptions of nature—unaffected by the Onceler, the Pollutians, and Max—in *The Lorax*, *The Wump World*, and *Where the Wild Things Are*.

Conquering the Site

The Conquering the Site area is near the main entrance to Garfield Elementary School—offering site visitors their first impression of the space. This space represents the concept of humans discovering and then conquering pristine natural environments. Inspiration for the area is derived from the human domination over the landscape expressed by the Onceler in *The Lorax*, the Pollutians in *The Wump World*, and Max in *Where the Wild Things Are*.

Positive Human Impacts on Nature

The Positive Human Impacts on Nature areas of spatial meaning create landscapes that demonstrate the potential for humans to interact with nature in a symbiotic relationship. Inspiration for this area of spatial meaning is derived from the wild things' acceptance of and integration of Max into their "wild things group" in the story *Where the Wild Things Are*. Also acting as inspiration in these spatial meaning areas is the Lorax character in the book *The Lorax*. The Lorax (who represents the human conscience) did not tell the Onceler to leave the Truffula Tree forest, but merely told him to consider the needs of the environment. The Lorax's advice for human conservation of (not human exclusion from) the environment also inspired the development of the Positive Human Impacts on Nature areas of spatial meaning on Garfield Elementary School's Outdoor Learning Environment.

Negative Human Impacts on Nature

The Negative Human Impacts on Nature areas of spatial meaning represent mankind's tendency to overrun natural settings and destroy them. Inspiration for these spaces is derived from the destruction caused by the Onceler to the Truffula Tree forest in *The Lorax* and the Pollutians to the Wump World in *The Wump World*.

The Hideout

The Hideout area of spatial meaning represents the retreat of nature's fauna and avifauna species from destructive human development. Inspiration for this space is derived from the Wumps retreat from Pollutian development in *The Wump World* and the retreat of the Swomee—Swans, Brown bar-ba-loots, and the humming fish from the Onceler's harvesting of the Truffula Tree forest in *The Lorax*.

Aftermath

The Aftermath areas of spatial meaning represent the lingering effects caused by human misuse of the environment. Inspiration for this space is derived from the destruction caused by the Pollutian and Onceler's development of the Wump World and Truffula Tree Forest in *The Wump World* and *The Lorax*.

Re-growth

The Re-growth areas of spatial meaning represent the resiliency of nature. Inspiration for these spaces is derived from the last Truffula Tree seed of hope in *The Lorax* and the little plant shoot breaking forth through the pavement in *The Wump World*.

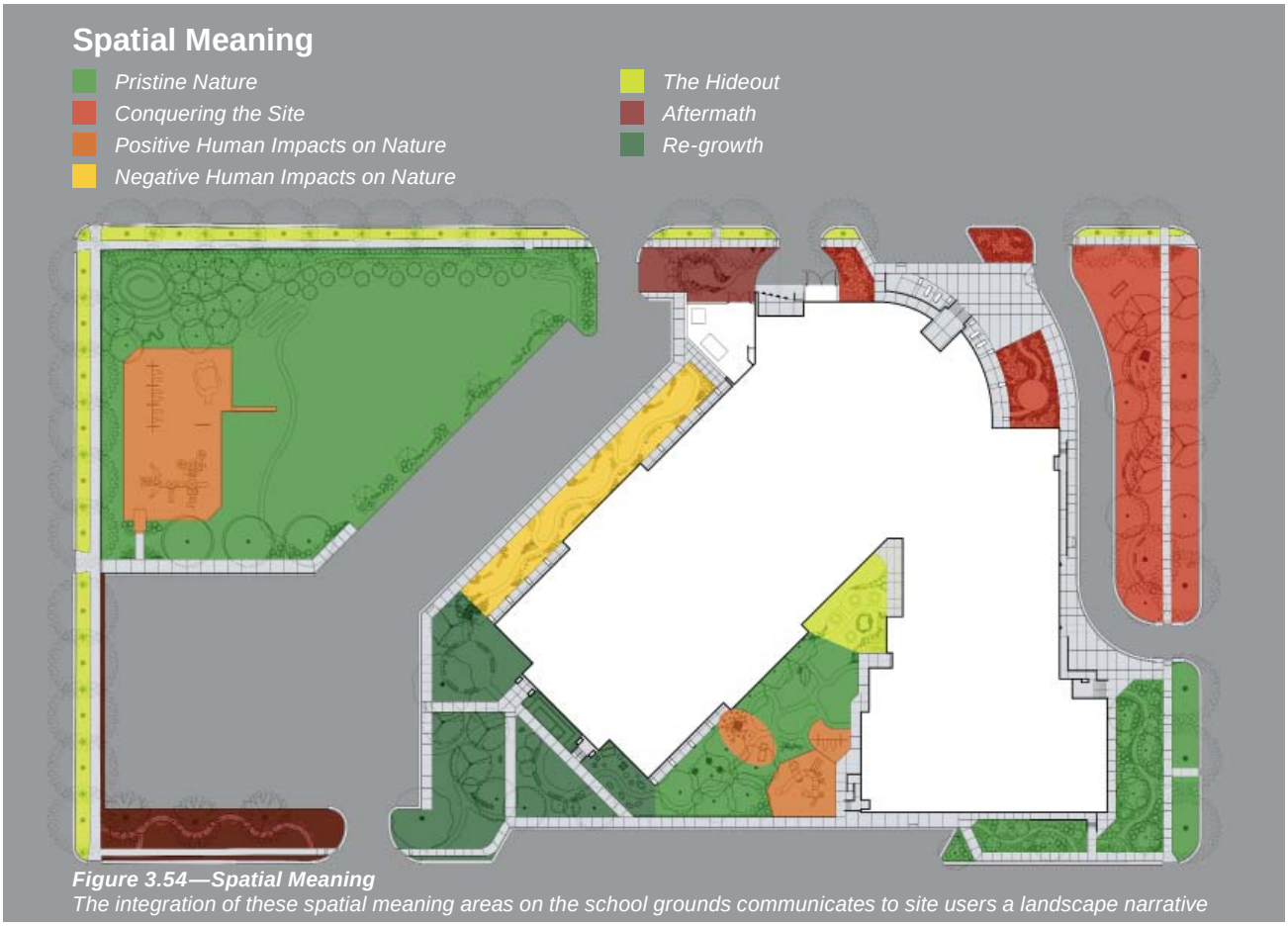


Figure 3.54—Spatial Meaning
The integration of these spatial meaning areas on the school grounds communicates to site users a landscape narrative

Spatial Meaning—The Lorax

- *Pristine Nature*
- *Conquering the Site*
- *Positive Human Impacts on Nature*
- *Negative Human Impacts on Nature*
- *The Hideout*
- *Aftermath*
- *Re-growth*

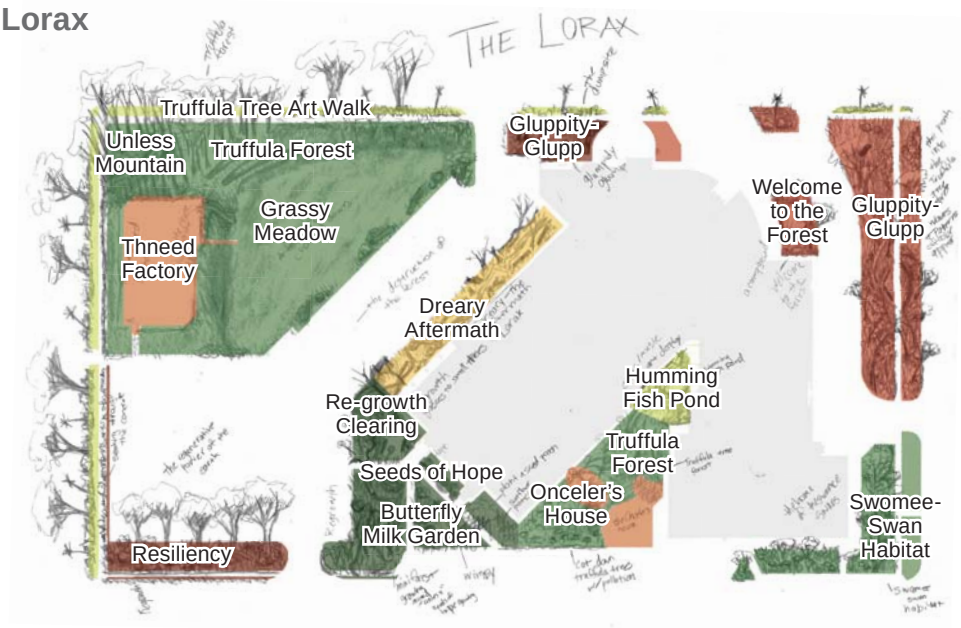


Figure 3.55—The Lorax
Conceptual spatial meaning areas

Spatial Meaning—The Wump World

- *Pristine Nature*
- *Conquering the Site*
- *Positive Human Impacts on Nature*
- *Negative Human Impacts on Nature*
- *The Hideout*
- *Aftermath*
- *Re-growth*

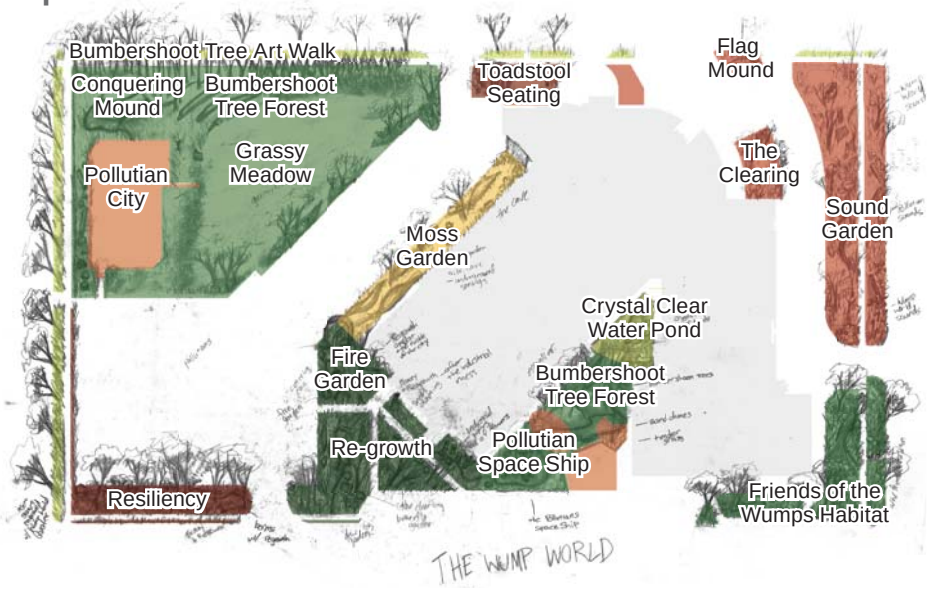


Figure 3.56—The Wump World
Conceptual spatial meaning areas

Spatial Meaning—Where the Wild Things Are

- *Pristine Nature*
- *Conquering the Site*
- *Positive Human Impacts on Nature*
- *Negative Human Impacts on Nature*
- *The Hideout*
- *Aftermath*
- *Re-growth*

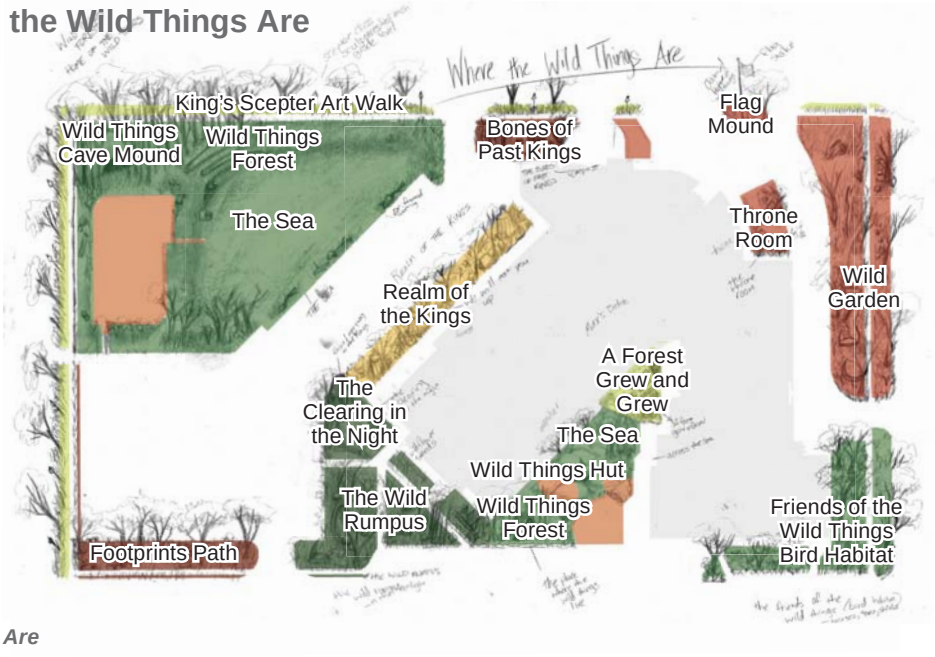


Figure 3.57—Where the Wild Things Are
Conceptual spatial meaning areas

Conceptual Design Spatial Meaning

These three diagrams represent the spatial meaning areas that were derived from the initial exploration of children's literature. The programmatic elements in each conceptual design were synthesized to form the site's final spatial meaning areas expressed in Figure 3.54 on page 117.

Description of Spatial Environments

The different experiential qualities of each spatial meaning area influenced the programmatic elements incorporated within them—namely the land archetypes and elements of nature. These programmatic elements express the emotional qualities of each spatial meaning area to create a cohesive and diverse site narrative describing the human-nature relationship. The emotional landscapes created promote children's connection to nature by augmenting ecological awareness. A detailed description of each element within the spatial meaning areas is listed below.

Pristine Nature

Wildlife Walk

The Wildlife Walk is a small area occupied by dense shrubs on the southeast corner of the Garfield Elementary School site and provides habitat for Kansas songbird species to occupy the space. This area of the site is not near any main entrances. There are two tertiary entrances to the building at the edges of this space that are infrequently used. It is somewhat protected from the wind and is infrequently visited, making it an ideal location to incorporate a small bird habitat that would give children the opportunity to observe native avifauna species. This provision of habitat for a range of biotic species is characteristic of pristine natural environments. Spatial inspiration is derived from the concept of the Swammee Swans' habitat in *The Lorax*.

Mogul Sea

The Mogul Sea area is located in the Early Childhood/Kindergarten Outdoor Learning Environment. This area depicts a rolling hills natural landscape—a smaller version of the Kansas Flinthills. This area offers a variety of elevation changes that give young children the sense of being on a mountain—the cuesta archetype— and can add spatial interest to the small activity zone. Inspiration for this space came from the sea. Inspiration for this space is derived from the sea that Max sailed across in *Where the Wild Things Are*, and the rolling hills landforms expressed in illustrations from *The Wump World* and *The Lorax*.

The Orchard

The Orchard, also located in the Early Childhood/Kindergarten Outdoor Learning Environment, represents the bounty of nature. This area is protected from the cold north winds, while also receiving maximum solar access, making it the most ideal place on site to grow fruit trees. Inspiration for this space is derived from the Truffula Tree fruits that provide food for the Brown bar-ba-loots in *The Lorax*.

Figure 3.58—Site Plan with Trees
The emotional landscapes created promote children's connection to nature by augmenting ecological awareness.

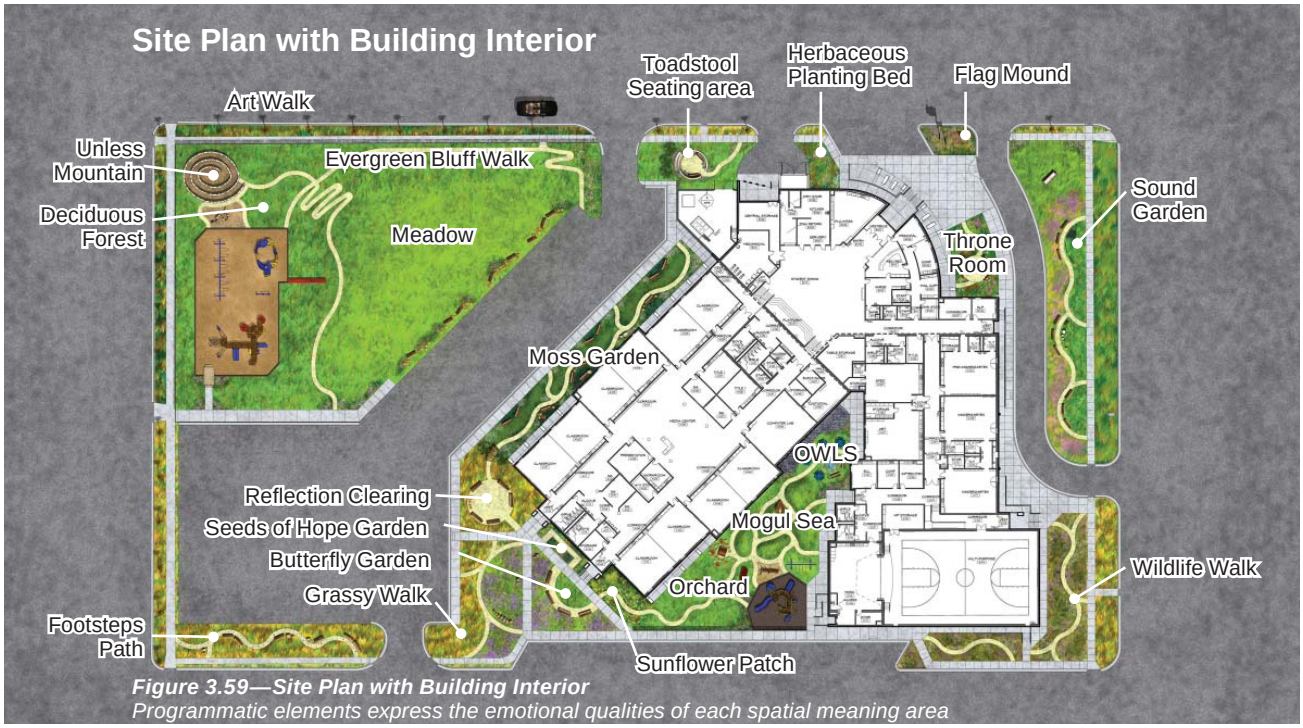


Figure 3.59—Site Plan with Building Interior
Programmatic elements express the emotional qualities of each spatial meaning area

Sand Pit Climbing Tree

The Sand Pit Climbing Tree is located in the Early Childhood/ Kindergarten Outdoor Learning Environment. This area offers small children the opportunity to play with two loose parts elements of nature that children are invariably drawn to—water and sand. The edge of the existing equipment area acts as the south edge of the sand pit. This outdoor activity space offers Garfield students access to a different type of Pristine Nature—sand dunes. Sand dunes contrast with other areas of Pristine Nature because of their reduced vegetation productivity levels. The inspiration for this space is derived from the sand dunes of *The Wump World*.

The Meadow

The Meadow, located in the 1st through 5th Grade Outdoor Learning Environment, is a large open grassy field representing a peaceful landscape of Pristine Nature. This area functions as the open field for soccer at recess or outdoor gym activities. The inspiration for the Meadow is derived from the grassy meadow of *The Wump World* and the open sea that Max sailed across in *Where the Wild Things Are*.

Evergreen Bluff Walk

The Evergreen Bluff Walk is located along the north edge of the lower terrace in the 1st through 5th Grade Outdoor Learning Environment, creating the sensory experience of a coniferous forest and providing a buffer from north wind. This path passes through dense vegetation while giving Garfield students the opportunity to experience the sensory quality of the bluff land archetype. Inspiration for this space is derived from the heavily wooded forest where the “wild rumpus” took place in *Where the Wild Things Are*.

Deciduous Forest

The Deciduous Forest is located on the north side of the plateau of the lower terrace in the 1st through 5th Grade Outdoor Learning Environment. This area changes with the seasons, giving students the opportunity to experience the temporal qualities of nature. Inspiration for this space came from the Bumbershoot trees of *The Wump World*, the Truffula trees of *The Lorax*, and the forest depicted in *Where the Wild Things Are*.

Unless Mountain

Unless Mountain is located in the northwest corner of the 1st through 5th Grade Outdoor Learning Environment. It merges with the upper terrace to create a mountain-like landform that offers the sensory qualities of the cuesta land archetype—giving children opportunity of feeling tall. Inspiration for this space came from the rock engraving of the word “Unless” in *The Lorax*.

Snake Sand Pit

The Snake Sand Pit is located directly north of the stationary play equipment area in the 1st through 5th Grade Outdoor Learning Environment. The north edge of the existing equipment area acts as the south edge of the sand pit. Similar to the Sand Pit Climbing Tree, the Snake Sand Pit offers the older Garfield Elementary School children access to the sand dunes type of Pristine Nature. The inspiration for this space is also derived from the sand dunes of *The Wump World*.

Conquering the Site

Herbaceous Planting Bed

The Herbaceous Planting Bed area is located in the “leftover space” north of the school building and directly west of the office personnel parking lot. This small site area is heavily shaded and represents the areas of Pristine Nature first being discovered by humans—which they see as a thing to dominate, to conquer. The inspiration for this space is derived from the pristine natural environments depicted in *The Lorax* and *The Wump World* as they were first discovered by the Onceler and the Pollutians.

Flag Mound

The Flag Mound with Grizzly Bear Sculpture is located in the “leftover space” directly east of the office personnel parking lot near the main school building entrance. This space is representative of human power and desire to dominate nature. The Flag Area, specifically, is inspired by the Pollutians conquering the Wump World in *The Wump World*.

Throne Room

The Throne Room seating area, adjacent to the northeast side of the school building, represents human domination through the creation of a throne made out of boulders. The shaded space also includes a Commoner’s Court, which is comprised of logs and stump seating, surrounding the Boulder Throne. The inspiration for the Throne Room is derived from Max’s crowning as king of the Wild Things in *Where the Wild Things Are*.

Sound Garden

The Sound Garden is located in the large “leftover space” on the school site’s east site boundary. This space reflects human discovery, development, and then lingering human impacts upon a natural site. This human-nature interaction is represented symbolically through a series of smaller sound gardens. First, the quiet sounds of the Wind Chime Garden represent the pristine landscape as it is first found by humans. These quiet, melodic sounds then crescendo into the loud booming sounds in the Thunder Drum Garden. The thunderous sounds are representative of humans’ development of nature—the sounds of construction and building. Inspiration for this space is derived from the Pollutians and Onceler’s family members building their unsustainable factories and settlements in *The Wump World* and *The Lorax*. The loud noises of the Thunder Drum Garden ultimately culminate in the quiet ringing sounds of the Bell Garden. These ringing sounds represent the shock of the native flora, fauna, and avifauna species (currently inhabiting the site) to this human development of nature. Inspiration for this space was derived from the shocked and sad expressions of the wumps reaction to the Pollutians taking over their world in *The Wump World.* Also, the forlorn expressions of the Swomee—Swans, Brown bar-ba-loots, and the humming fish to the Onceler’s destruction of their Truffula Tree forest home in *The Lorax* influenced the development of the Bell Garden

Positive Human Impacts on Nature

Art Walk

The Art Walk areas are located in the small, segmented spaces that are directly adjacent to the most frequently traveled streets surrounding the site—State Street and Osage Street. Honeylocust trees provide filtered shade on the edges of the site with native grasses lining the edges and creating a distinctive separation from vehicular traffic. Wooden art sculptures, perhaps created by Wichita State University sculpture students, can be decorated by Garfield Elementary School students (one sculpture per class) and would emphasize entering the school site and give students a sense of ownership of the space. The inspiration for this spatial series is derived from the potential that the Onceler had to integrate himself into the Truffula Tree forest without harming the habitat in the tale of *The Lorax*.

Figure 3.60—Unless Mountain and Deciduous Forest Path
The wonders of nature are abundant in this sensory landscape

OWLS (Outdoor Wildlife Learning Site) Area

The OWLS area is located in the inner apex of the "V"-shaped school building is a school resource for all grade levels containing a pond area that serves also as a place for classes to have outdoor lunch. Located by the Art and Special Education classrooms, the incorporation of an interactive art chalk wall and display area gives students the opportunity to express creativity outdoors. Positive human interactions with nature are then created by integrating children's art into a natural setting. The inspiration for this space came from the potential that 1) the Onceler had to respectfully experience the Humming Fish Pond in *The Lorax* and 2) the Pollutians had to respectfully experience the crystal clear waters in *The Wump World*. The space is also inspired by thinking of it as an undisruptive merger between humans and nature that is depicted in Max's room, where "a forest grew and grew" from the tale *Where the Wild Things Are*.

Negative Human Impacts on Nature

Onceler's House

The Onceler's House is located in the Early Childhood/Kindergarten Outdoor Learning Environment. This house offers children the opportunity to experience the burrow land archetype—the sensation of being protected and small. The hut is surrounded by stumps—depicting human destruction of nature. Inspiration for this space is derived from the Onceler dwelling in *The Lorax*.

Early Childhood/Kindergarten Stationary Play Equipment Factory

The stationary play equipment found in the Early Childhood/ Kindergarten Outdoor Learning Environment is currently in existence on the site. This site feature depicts human separation from nature because the fixed equipment directs students' attention away from nature. Inspiration for this space is derived from the the Onceler's thneed factory as described in *The Lorax*.

First-Fifth Grade Stationary Play Equipment Factory

The stationary play equipment found in the First through Fifth Grade activity area is already implemented onsite. This site feature, like the Early Childhood/Kindergarten Stationary Play Equipment Factory, depicts human separation from nature because the fixed equipment directs students' attention away from nature. Inspiration for this space is derived from the the Onceler's thneed factory described in *The Lorax*.

Blacktop Surface Play Area

The blacktop surface play area is located on the parking lot directly west of the school building. Activities offered are tetherball and basketball. This site feature, currently in existence onsite, depicts the human separation from nature because it does not offer children opportunities to interact with nature; it is a manmade surface. Inspiration for this space is derived from the Pollutians' development of the Wump World in *The Wump World*.

The Hideout

Moss Garden

The Moss Garden is located in the "leftover space" directly west of the school building. This area of the site receives the most shade, making it the most suitable location for the moss garden to occur. The Moss Garden represents the burrow and cove land archetypes, giving students the sensation of being hidden, protected. The space also represents the hideout to which biotic species relocate in an attempt to avoid human development. Inspiration for this space is derived from the Wumps' cave where they hid from the Pollutians in *The Wump World*.

Aftermath

Footsteps Path

The Footsteps Path is located in the "leftover space" on the southwest corner of the site directly adjacent to the faculty parking lot. This area of the site is exposed and unsheltered; it receives little protection from wind and has direct solar access. The Footsteps Path showcases human impacts upon the landscape in the form of footsteps gently impressed into a concrete path. Inspiration for this space is derived from the footprints of the Wild Things in *Where the Wild Things Are*, and can also represent the footprints of the Pollutions and in *The Wump World* and the Onceler's family in *The Lorax*.

Toadstool Seating area

The Toadstool Seating area is located in the "leftover space" near the northwest corner of the school building by the building's service entries. This area of the site is heavily shaded and receives little protection from cold north winds, making it an ideal space to represent the abstract concept of decay that is expressed in both *The Lorax* and *The Wump World*. This idea is represented by wooden toadstool seats that demonstrate the decay of nature caused by human degradation to the environment. Inspiration for this space is derived from the damaged landscapes caused by the Onceler and the Pollutians described in both *The Lorax* and *The Wump World*.

Re-growth

Butterfly Garden

The Butterfly Garden is located in the triangle-shaped “leftover space” near the two secondary building entrances on the southwest corner of the school building and represents rejuvenation of the land. This space is sunny, protected from wind, and is peaceful, making it an ideal place for a butterfly garden. This area represents the concept of rejuvenation. Inspiration for this space is derived from the Butterfly Milk of *The Lorax*.

Sunflower Patch

The Sunflower Patch is located in the “leftover space” on the south side of the southwest building corner adjacent to the Early Childhood/ Kindergarten activity area. This area is sunny and protected from wind, making it ideal for sunflowers. The Sunflower Patch represents the re-growth of nature that can be achieved through human stewardship. Inspiration for this space is derived from the last Truffula Tree seed of hope in *The Lorax*.

Seeds of Hope Garden

The Seeds of Hope Garden is located in the “leftover space” on the south side of the southwest building corner between the two entrances. This area of the site is most suitable for growing garden plants because it is sheltered from wind and collects sunlight. Like the Sunflower Patch, the Seeds of Hope Garden represents the re-growth of nature that can be achieved through human stewardship. Inspiration for this space is derived from the haunting “unless” seed of hope at the end of *The Lorax* and the vegetation pushing up through pavement cracks in *The Wump World*.

Reflection Clearing

The Reflection Clearing is located in the “leftover space” between the southwest corner of the building and the parking lot and features an outdoor seating area that is enclosed by tall grasses. This space represents the potential of nature to rejuvenate itself from human maltreatment in the form of a serene clearing. Destructive human influences on the environment are represented by the log seating, while nature’s resiliency is represented by the tall grasses growing up around the space. Inspiration for this space is derived from the clearing in the moonlight where Max conducted the wild rumpus in *Where the Wild Things Are* and the unharmed clearing that the Wumps found after they emerged from their cave hideout in *The Wump World*.

Grassy Walk

The Grassy Walk is located in the “leftover space” south of the school building near the teacher parking lot entrance. Maximum sunlight and wind passes through this space, making it an ideal location for students to experience the sensorial qualities of native Kansas prairie grasses. This space also features a Caterpillar Seat composed of boulders that children can climb or sit on—the outcropping land archetype. Inspiration for this space is derived from the grass pushing up through pavement cracks in *The Wump World* and the wildness of nature expressed in the illustrations from *Where the Wild Things Are*.

Design Diagrams

The following diagram series expresses the spatial qualities and site features enhanced in Garfield Elementary School's proposed Outdoor Learning Environment design.

Circulation

Vehicular circulation routes, crosswalks, and building entrances remain as they exist currently in the proposed site design. Pedestrian circulation also remained the same in principle: public circulation areas are located around the site's perimeter while more private circulation is located closer to the building. The majority of community members pass around the perimeter of the site on the paths and sidewalks situated near the edges of the school block. The walks located within the playground areas are utilized primarily by Garfield students and staff; however, they may be used on the weekends and during after school hours by community members wishing to use Garfield's play areas. Walks closest to the actual building are primarily utilized by Garfield students, parents, and staff wishing to enter the school building and are considered to be relatively private.

The number of paths offered onsite in this design proposal has been significantly increased from the existing site conditions. Augmented path diversity and range promotes accessibility between the public and private circulation routes and also improves the transitions between the site's spatial environments.

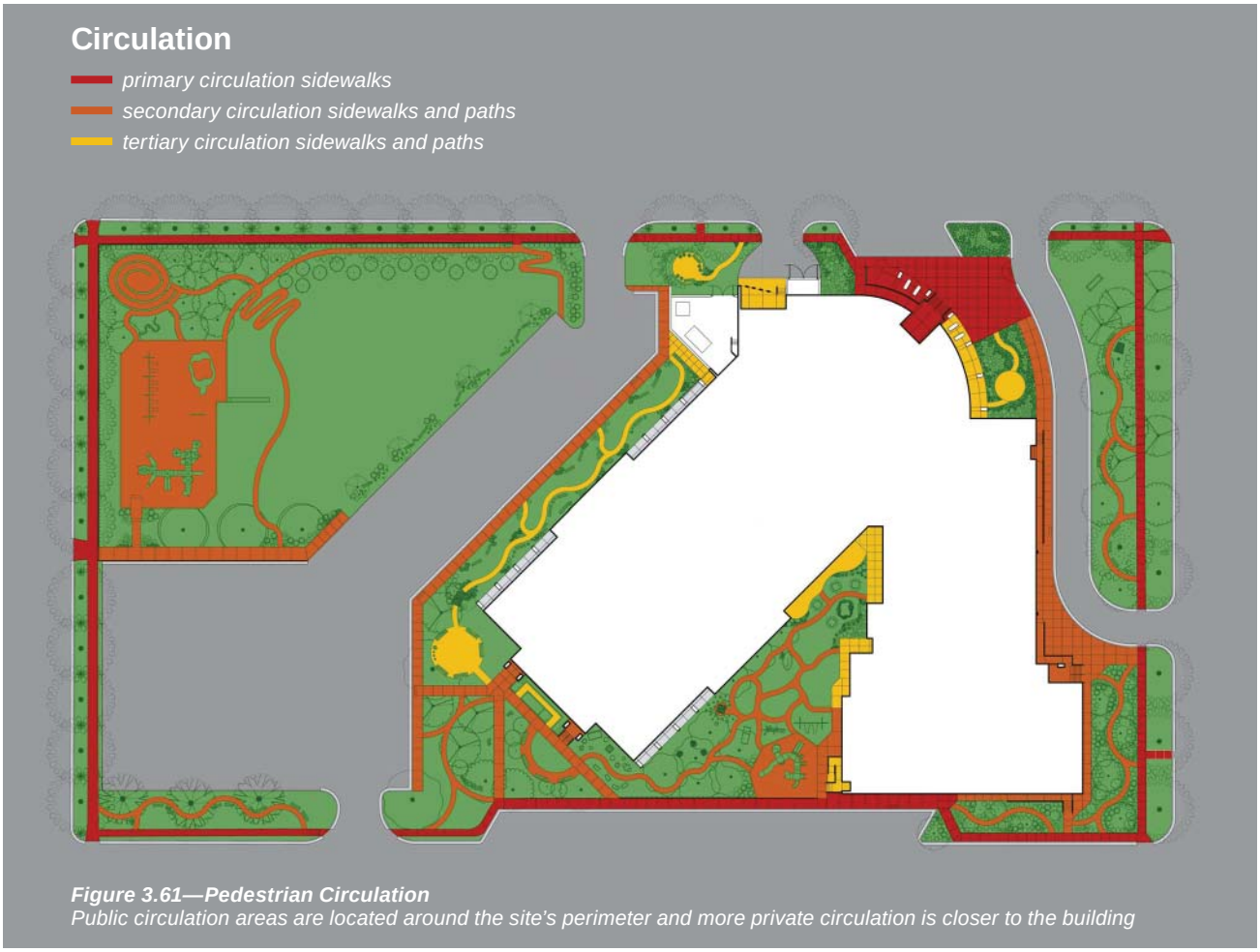


Figure 3.61—Pedestrian Circulation
Public circulation areas are located around the site's perimeter and more private circulation is closer to the building

Gathering Space Hierarchy

Three sizes of outdoor gathering spaces are integrated into the Garfield Elementary School Outdoor Learning Environment to accommodate for a range of teacher-led learning activities.

The largest of these outdoor gathering spaces is located in the 1st through 5th Grade Outdoor Learning Environment along the northwest corner of the lower terrace. This outdoor gathering space can hold up to 50 or more students and acts as an outdoor amphitheater for the school site. The space dual functions as an ADA accessible pathway to connect the Deciduous Forest area with the Soccer Field area below. A Crusher fines material composes the seating area of the space/ pathway.

Five secondary, or medium-sized, gathering spaces are located on the school grounds. One of these secondary gathering spaces is located in the OWLS area. The remaining spaces are implemented in four of the site's larger "leftover spaces," giving these previously ineffectual areas the means to enhance student learning. These spaces are large enough to hold one or two classes—about 30 or 40 students. (However, they are most suitable in size for one class.)

Eighteen tertiary, or small-sized, gathering spaces are located on the school grounds. Six of these spaces are located within the Moss Garden and four of them offer transitional seating between the blacktop play area and the soccer field. Four small outdoor gathering spaces are located in the Footsteps Path area and three are in the Sound Garden. One small gathering space is created by stump seating around the Onceler's House in the Early Childhood/Kindergarten Outdoor Learning Environment. These small gathering spaces hold up to 10 students.

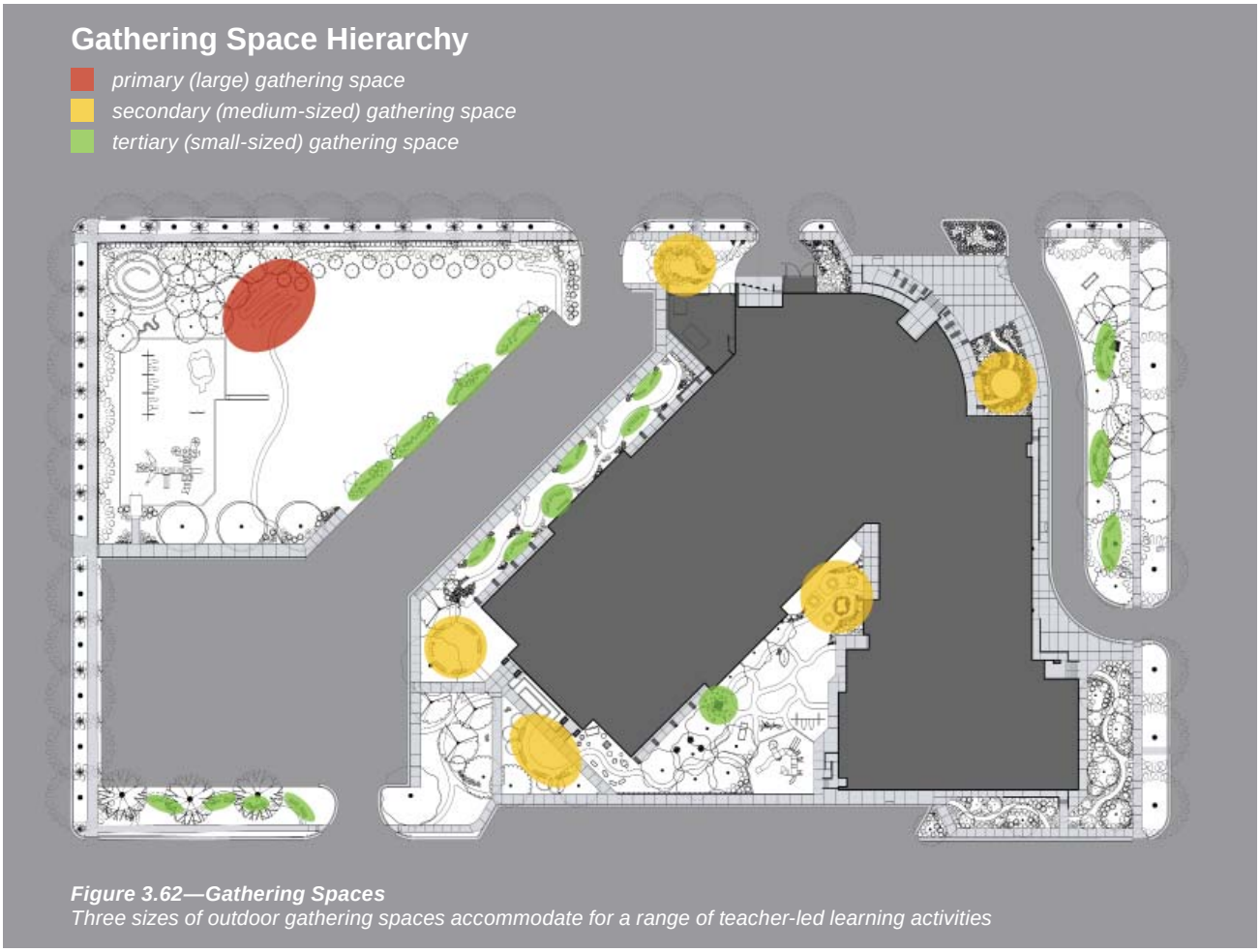


Figure 3.62—Gathering Spaces
Three sizes of outdoor gathering spaces accommodate for a range of teacher-led learning activities

Land Archetype Locations

The seven land archetypes (derived from Julie Moir Messervy's land archetypes in her book *The Inward Garden: Creating a Place of Beauty and Meaning*) that are incorporated on the Garfield Elementary School Outdoor Learning Environment are: the meadow, the burrow, the cove, the bluff, the outcropping, the cuesta, and the sky. Each of these land archetypes creates has different spatial qualities and accommodates different outdoor learning activities. (Refer to the Land Archetypes section of this book on page 83 within the Design Development chapter for a detailed description of these land archetypes.)

The meadow land archetype areas are: the soccer field, the Wildlife Walk, the Orchard, and the Footsteps Path. These spaces inspire children to feel the sensation brought with being immersed in a space.

The burrow land archetype areas are: the Moss Garden, the Onceler's House, and the three willow tree Wild Thing huts found in the Early Childhood/Kindergarten Outdoor Learning Environment. These spaces inspire children to feel the sensation of being enclosed in a small space on all sides with a narrow view outward.

The cove land archetype areas are: the Toadstool Seating Area, the Throne Room, the Sound Garden seating areas, the OWLS area, the Butterfly Garden Room, the Clearing, and the amphitheater pathway. These spaces inspire children to feel the sensation of having their backs protected with views outward; it is a less enclosed sensation than is felt in the burrow.

The bluff land archetype areas are: the Evergreen Bluff Walk and the west edge of the lower terrace in the 1st through 5th Grade Outdoor Learning Environment. These spaces inspire children to feel the sensation of standing on a precipice—inspiring them to overlook surrounding lands.

The outcropping land archetype areas are: the Snake Sand Pit, the Caterpillar Seat, and the Sand Pit Climbing Tree. These spaces inspire children to feel the sensation of standing on a raised object or landform that juts out from the surrounding space.

The cuesta land archetype areas are: Unless Mountain and the Mogul Sea. These spaces inspire children to feel the sensation of standing on a high place that offers expansive views of the surrounding land.

The sky land archetype areas are: the swing sets and slides in the stationary play equipment areas and the Hill Slide on the west edge of the lower terrace in the 1st through 5th Grade Outdoor Learning Environment. These spaces inspire children to feel the sensation of vertical movement through space such as the feeling of flight or the effects of gravity.

Figure 3.63—Land Archetype Locations
Land archetypes give students opportunities to experience a range of spatial qualities and outdoor learning activities

Planting Design

Native Plants Can Make Children Aware of Local Nature

Planting design is another important component of this design because the specification of primarily native plants further promotes children's sensory experiences with nature. Native plants also offer have other advantages over non-native plant species. 1) Native plants are resistant to the diseases and insects found in their habitat and therefore stand a greater chance of survival than most alternative plant species. 2) Most native plant species require little to no maintenance once established. 3) Many native plant species provide habitat for local wildlife, which offers children more opportunities to interact with nature's biotic species.

There are eight plant microclimates in Garfield's Outdoor Learning Environment. These vegetative areas are: 1) turf, 2) shaded tall grasses, 3) shaded perennial herbaceous plants, 4) moss, 5) full-sun perennial herbaceous plants, full-sun tall grasses, full-sun shrubs, and full sun garden plants. Each of these areas includes a specific plant mix. (Refer to Appendix D to see the quantities and placement of the plant species specified for the site.)

The specified plants were selected in consideration of the sunlight and water requirements for different areas of the site as well as considering bloom period of the plants in an attempt to create seasonal interest throughout the year. Plants are also selected for different purposes including the bird habitat area on the southeast corner of the site and the butterfly garden directly south of the southwest corner of the school building. Plants that have poisonous parts or thorns are not used on the site. The goal of utilizing native plants is to enable GES students to witness the beauty of local nature while at the same time reducing site maintenance.

Plant Maintenance

It is important to note that site maintenance may be more costly initially due to the increased labor involved with the initial establishment of native plants. However, after one to two years, these species should require less maintenance to ensure health than would a typical turf lawn. Also, the moss garden area will require irrigation, making its upkeep more costly than the remaining site areas. The spatial variety and learning opportunities provided to students and community members by the moss garden would far outweigh the costs of irrigation.

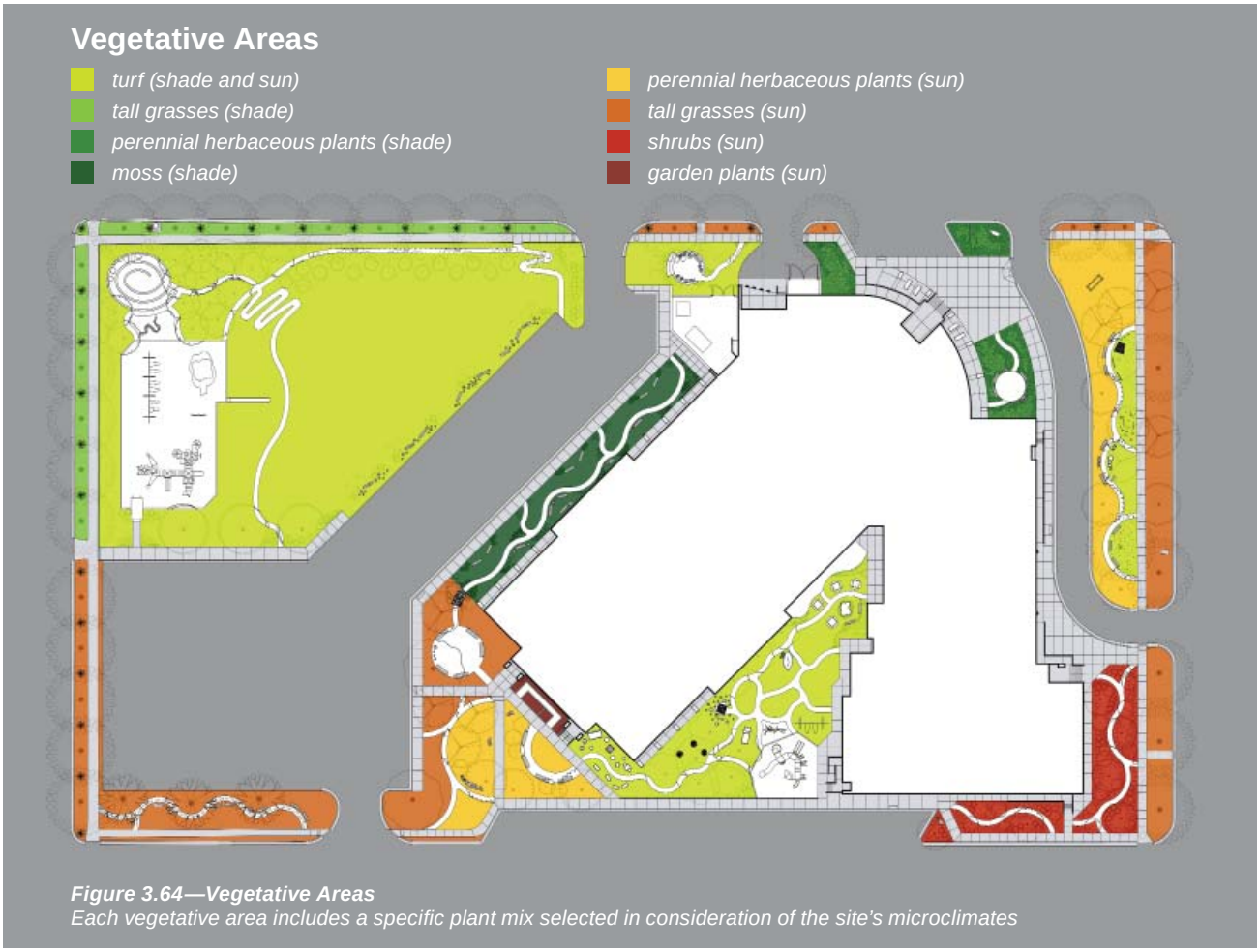


Figure 3.64—Vegetative Areas
Each vegetative area includes a specific plant mix selected in consideration of the site's microclimates

Fulfilling Safety Standards

Four Components of Safety

There are four components that can ensure student safety at Garfield's Outdoor Learning Environment. 1) Adult supervisors must be trained to observe and facilitate student activities to ensure playground safety. 2) Students must be taught proper procedures to interact with some of the more risky site features, such as Unless Mountain and the Hill Slide. 3) The school's spatial environments must be developed to promote safe outdoor student activities. 4) Maintenance personnel must regularly check and make repairs to the stationary equipment and play facilities. This list of safety ideals is derived from the School Playground Safety Guidelines for Educational Service District 112 in Vancouver, Washington.

Garfield Elementary School staff members are responsible for ensuring tenets 1, 2, and 4 of these safety guidelines, while the Outdoor Learning Environment design focuses on accomplishing tenet 3. Because traditional playground design at school facilities consists primarily of stationary play equipment and hard surface play areas, a majority of the student injuries that occur at school involve falls. To discourage this accident potential, the Outdoor Learning Environment design proposal offers students the opportunity to engage in a variety of outdoor learning activities in a range stimulating environments—improving site safety by reducing the number of students (and thereby the number of accidents) that occur on the school's stationary playground equipment areas.

The Difference between Hazard and Risk

The Free Dictionary (2013) defines hazard as "a possible source of danger that can cause injury or harm," while risk is defined as "exposure to a chance of loss; vulnerability." Children need opportunities to experience risk in an outdoor learning environment—the chance to test new skills such as coordination or strength. Examples of risk opportunities on the Garfield school site include the boulders in the 1st through 5th grade activity area and the grass moguls in the Early Childhood/Kindergarten activity area where students of both age groups can test and improve their climbing abilities. Potential hazards, on the other hand, should be avoided. An example of a potential hazard could be a sharp metal object protruding from a slide in the stationary play equipment area.

The U.S. Consumer Product Safety Commission lists five recommendations for reducing hazards on public sites for children. 1) Protective surfacing should be provided to reduce injuries from falls, known as fall zones. 2) Activity areas should have adequate spacing to prevent injuries, especially swings. The landforms incorporated in each activity area adequately meet the size requirements of each user age group. Early Childhood/Kindergarten students have a smaller area copse of trees in their activity area, while the 1st through 5th grade students have a much larger forest-like area; each space fits the experiential needs of the student user groups. 3) “Platforms more than 30” above the ground should have guardrails to prevent falls” (U.S., 2013)—Unless Mountain, which is 9 feet tall, has such guardrails. 4) Site elements should have adequate spatial separation to prevent potential entanglement and head entrapment hazards and to prevent pinch or crush points. 5) Playground maintenance can help to ensure that hazards are avoided on the Garfield Elementary School Outdoor Learning Environment.

Natural Materials Promote Safety

However, perhaps the most integral factor in eliminating hazards on the school site is the incorporation of natural materials and landforms. Many of these elements of nature are softer than manmade cement or asphalt hard surface playground areas and can cushion falls—reducing the potential for injuries to occur. Also, the varied spatial environments motivate students’ exploration and awareness of nature, while encouraging their engagement in personal risk and development activities such as balancing on logs. Another benefit of the Garfield site is that natural materials weather with age, enabling children to understand the strength and durability of nature—further promoting personal exploration of the local environment.

Implementation Plan

Encouraging Implementation

A primary design goal for the Garfield Elementary School Outdoor Learning Environment is to increase the likelihood of the project's implementation. In order to accomplish this goal, the site design incorporates native plants, specifies materials that are low-cost or could easily be donated, and minimizes site maintenance (except in the Moss Garden and Mogul Sea spaces). However, the main vehicle to promote the project's implementation is community involvement in the fundraising and construction of the Outdoor Learning Environment. Community involvement could significantly reduce the cost of project implementation. Therefore, less funding would be needed for the development of the Outdoor Learning Environment—which could significantly improve the chances of the project being built. Currently, the lack of funding is the primary barrier hindering the development of the Outdoor Learning Environment on the school grounds. Community involvement could alleviate a significant amount of this financial burden and make construction of the Outdoor Learning Environment feasible.

Involving the Local Community to Reduce Implementation Costs

Garfield Elementary School could significantly reduce the costs of implementing the proposed Outdoor Learning Environment design by involving the surrounding community in the project's construction. This reduction in cost is especially important to consider as the school system has to pass a bond issue, hold a series of fundraisers, compete for grants, or utilize a combination of these fund-raising methods to collect the money needed for such a large scale construction project as a playground redevelopment project. Therefore, by asking local businesses to donate materials or funding and by involving community members or organizations in the construction process, the cost of project implementation could be significantly lessened than if all of the materials and supplies were to be purchased new and a landscaping company was responsible for the entire project's construction.

Ultimately, the goal of involving the surrounding community in the development of Garfield Elementary School's Outdoor Learning Environment is to limit the cost of the project to solely purchasing plants, paving materials, and earthwork needed for several areas onsite. Perhaps even these costs could be reduced by receiving discounts or donations from local businesses such as plant nurseries or rock quarries. Much of the funding, materials, and construction needed for the project's implementation could be donated by local community members or businesses. Several of these suggested community members and organizations that could prove to be valuable resources in the development of an Outdoor Learning Environment for Garfield Elementary School are described below.

Parent-Teacher Organization Members

Garfield Elementary Schools Parent-Teacher Organization (PTO) members could be asked to volunteer time contacting other community groups to locate the materials and funding needed to implement the Outdoor Learning Environment project. Also, this group could be responsible for the development of the series of magnetic outdoor chalk boards that will be attached to the west wall of the O.W.L.S. area on the school grounds. (A partnership with the Augusta High School Woodshop class or several volunteer parents and these PTO members may be necessary to create the chalkboard frames and attach the boards to the exterior building wall for this task.) Seasonal management of the higher maintenance outdoor areas could be conducted by the PTO members as well. An example of a higher maintenance area for fall would be the orchard area in the Early Childhood-Kindergarten portion of the Outdoor Learning Environment. PTO members may be responsible for collecting excess fruit produced by the plum trees.

Augusta High School Students

Augusta High School Woodshop students could be recruited to build the raised planting beds on the south side of the school building as a class or community service project. These secondary education students could also be asked to construct the wooden sculpture poles for the elementary school's art walk display along State and Osage streets. Therefore, the cost of implementing these two features would be limited to purchasing the supplies necessary for the Woodshop class to build them. The wooden boat play structure and "Onceler" playhouse from Dr. Seuss's The Lorax could also be built as a class project by Augusta High School Students. Special care should be taken in determining the blueprints of these structures to ensure that they are ADA accessible. (Parents of students who are skilled at construction could be responsible for building these play structures for the Early Childhood/Kindergarten Outdoor Learning Environment should Augusta High School Students not be able to construct the structures.)

A more expensive option for the inclusion of the ship and house play structures is to purchase them pre-made. Lowe's has several play house options available for purchase from that could be decorated to function as the "Onceler's house." I think that the "Swing-N-Slide Wood Funky Funhouse Playhouse Kit" (item number 247612 and model number PB 8152) available for purchase at $495 matches the look and feel of the "Onceler's house" best. Also, pre-built ship playground equipment structures can be purchased from Pirate Play Ships or Rustic Backyard Structures. The phone number and email address for Pirate Play Ships, which is located in Mount Juliet, TN, is 615-545-1469 and derek@pirateplayships.com. Rustic Backyard Structures is a small, family-managed business run by Brian and Lisa Allan of

Innisfail, Alberta, Canada. The business's phone number is 1-866-614-4974. These pre-made play structure options are far more costly than community-built versions; therefore, I recommend that the Augusta community organizations, such as Augusta High School students, be responsible for the creation of the play structures if at all possible.

College Students

The Wichita State University sculpture class art students could be recruited to build a grizzly bear sculpture that is roughly four feet high, two and a half to three feet wide, and five to six feet long; this sculpture would be located near the entrance of the Garfield Elementary School building. The sculpture could be made out of driftwood have a similar appearance to Deborah Butterfield's horse sculptures or Andries Botha's elephants. Art students from Wichita State University (WSU) or a community college such as Butler Community College could also be considered as alternate options for the construction of the wooden sculpture poles along the art walk should the Augusta High School students elect not to build them. Also, students taking horticulture classes at WSU or Butler Community College could be recruited to help Garfield staff and students construct and plant willow huts in the Early Childhood/Kindergarten Outdoor Learning Environment and a willow branch tunnel that acts as the grand entryway into the moss garden. Willow whips, which are necessary to build the structures, can be purchased through the earthplay.net website from this link: http://store.earthplay.net/products-page/willow/living-willow/.

Local Artists

Franklin L. Jensen, a local Augusta artist responsible for building over 50 steel and metal sculptures which are displayed on Henry's Sculpture Hill along Highway 400, is another potential option for developing the Garfield Elementary School Grizzly Bear Entryway Sculpture. His address is 10410 S.W. Boyer Road, Augusta, KS 67010 and his telephone number is 316-775-5296. Even if he is not available, there are potentially several less recognized local artists that could be recruited to donate their services in the creation of sculpture for an Outdoor Learning Environment at Garfield Elementary School.

Other well-known Kansas artists that could be contacted, but may be less likely to help as they are not local Augusta community members, include Gino Salermo of Wichita, Doren Spillman of Hoxie or his apprentice Staci Martin, Michael Wickerson of Kansas City, and Todd Baker of Overland Park. All of these artists are recognized woodworkers in Kansas and could potentially be recruited to create either the Grizzly Bear Entryway Sculpture or the art walk wooden sculpture poles. Gino Salermo's studio address is 1926 N. Saint Paul Street, Wichita, KS 67203; his email is finewoodsculpture@yahoo.com.

Doren Spillman's address is 1926 N. Saint Paul Street, Wichita, KS 67203; his phone number is 785-675-3495. Michael Wickerson can be contacted via his email address, which is mail@wickersonstudios.com or telephone number—913-677-1447. Todd Baker's address is 7715 West 79th Street, Overland Park, KS 66204.

Martin Marietta Materials

The Augusta Quarry, Martin Marietta Materials, is a local business that could potentially donate many of the hardscape materials necessary to develop the proposed Garfield Elementary School Outdoor Learning Environment site. Hardscape materials needed for the construction of the learning environment include: sand for sand pit areas, crushed stone for pathways, boulders for seating or climbing structures, rock for retaining walls, and flagstone pavers for the O.W.L.S. interactive outdoor art display area. Purchasing hardscape materials, along with site grading and plants, denotes the primary cost of the project's construction. By donating or discounting these materials, Martin Marietta Materials Augusta Quarry could greatly reduce the cost of the Outdoor Learning Environment's implementation—thereby making its realization onsite more feasible. The company's address is 7160 SW Diamond Road, Augusta, KS 67010 and its telephone number is 316-775-5458.

Local Tree Services

Local tree service companies such as Hummel Tree Services or Green Pasture Lawn & Tree could be contacted to collect trees that have been removed from other sites to use as outdoor seating elements for Garfield's Outdoor Learning Environment. Trees that are naturally rot resistant, such as cedars or oaks, should be given first priority to use onsite because they are longer-lasting than non-rot resistant trees. Also, rot-resistant trees do not need to be treated—eliminating the cost of wood treatment supplies. Trees that have been affected by disease or insect problems should not be recycled from the tree service companies for the learning environment site—especially if the removed trees' problems could threaten the plants proposed to be incorporated onsite. Hummel Tree Service is located in Towanda which is about 15 minutes north of Augusta. The company's address is 718 NW Diamond Road, Towanda, KS 67144-9174 and its phone number is 316-541-2758. The address for Green Pasture Lawn & Tree is 14471 SW Ohio Rd, Augusta, KS 67010 and its phone number is 316-640-5014.

Garfield Elementary School students whose parents have pickup trucks could be recruited to drive to the tree removal companies and select trees for the outdoor seating and then transport the trees back to the Garfield Elementary School site. Parents with chainsaws could then cut the selected trees into seating elements in the form of either large bench-like log seats or individual stump seats.

Local Plant Nurseries

Local plant nurseries could also be contacted in order to request the donation or discounted purchase of plant materials Garfield Elementary School's Outdoor Learning Environment. Some of these local nurseries include Tree-Rific Nursery & Landscaping, Stone Creek Nursery, and Flinthills Nursery LLC. Tree-Rific Nursery & Landscaping is located in Andover about 12 miles west of Augusta. Stone Creek Nursery is located in El Dorado and is located about 25 miles northeast of Augusta. Flinthills Nursery LLC is located about five miles east of Augusta and specializes in trees. The address for Tre-Rific Nursery & Landscaping is 13594 SW Us Highway 54, Andover, KS 67002 and the company's phone number is 316-733-0900. Stone Creek Nusery's address is 415 Metcalf Road, El Dorado, KS 67042. The company's phone number is 316-321-3331 and fax # is 316-321-5882. Flinthills Nursery LLC

Garfield Elementary School Students and Teachers

The students and teachers of Garfield Elementary School should be involved with each of the groups that aid in the development of their Outdoor Learning Environment. Whether this aid takes place in the form of actually integrating children in the building process or writing thank you cards to those businesses, organizations, and community members who donated their supplies, time, and skills to construct the Outdoor Learning Environment, the school's students should be active participants in the development of their school grounds. By being active in the development process, students will feel a deeper connection to the school grounds and a greater desire to utilize and protect the community resource. Also, community groups may be more likely to aid in the development of the Outdoor Learning Environment after witnessing the appreciation of the school's students and staff.

Hosting Community Build Days

Many of the projects that are necessary for the development of the Garfield Elementary School Outdoor Learning Environment can be constructed on designated community build days. I recommend that these proposed construction projects occur over an extended period of time rather than all at once. The projects should occur as each

community group becomes available and as the school accumulates funding to support the construction of each project. Therefore, it is recommended that the construction of the Outdoor Learning Environment be phased over a period of time.

Phasing Implementation

The implementation of Garfield Elementary School's Outdoor Learning Environment is recommended to be phased over a period of time. The site areas recommended to be constructed first are the Art Walk, Footsteps Path, and Wildlife Walk; these areas are most frequently used by the public and highlight the school's potential to function as a community resource. Second for construction are the Sound Garden and the Toadstool Seating area because they are larger perimeter spaces that act as learning resources for both students and community members. The Seeds of Hope Garden, Throne Room, and Butterfly Garden are third on the project implementation plan—effectively connecting the Early Childhood/Kindergarten activity zone with the 1st through 5th grade activity zone. Then the orchard and forest areas are recommended for development because they are located within the larger student activity zones and should be the second most costly features to implement. The earthwork, which is the anticipated primary expense for the project, will occur last—Unless Hill in the 1st through 5th Grade activity zone, the Mogul Sea in the Early Childhood/ Kindergarten activity zone, the OWLS pond area, the Flag Mound, and the Moss Garden's berms.

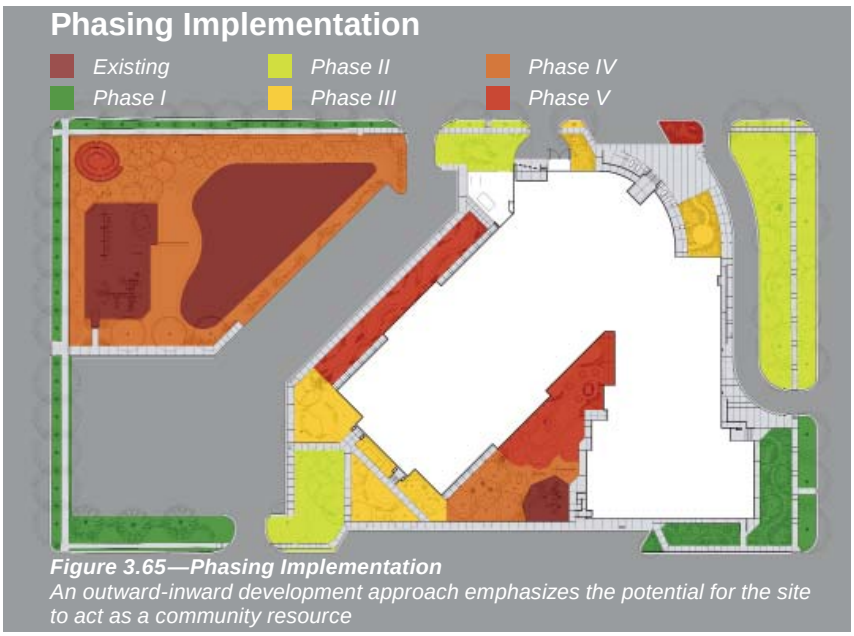


Figure 3.65—Phasing Implementation
An outward-inward development approach emphasizes the potential for the site to act as a community resource

Community Involvement in Construction Promotes Facility Pride and Reduces Vandalism

By involving the Augusta and surrounding community in the construction of Garfield Elementary School's Outdoor Learning Environment, community pride regarding the school will be enhanced. As a result, members of the community will be more apt to utilize and enjoy the Outdoor Learning Environment because they will feel an inherent sense of pride and responsibility toward the site's management. Community support and involvement in the construction of Garfield Elementary School's Outdoor Learning Environment will inspire both children and adults in the town to experience a deeper connection to with the site—both increasing community members' usage of the space and desire to protect it from vandalism.

Conclusion

Figure 4.01—Child on Swing
Sketch of a girl on a tree swing

Figure 4.02—Sunlight over Garfield
Sycamore in Augusta, KS

Conclusion

The fundamental goal of this project is to design an Outdoor Learning Environment for Garfield Elementary School that encourages children to develop a bond with the natural environment. To accomplish this goal, the proposed site design offers Garfield students the opportunity to interact with a range of spatial environments and elements of nature. By focusing on the provision of diversity, the Outdoor Learning Environment encourages each individual student to find an aspect of nature to which he/she emotionally connects. Such emotional connection is the cornerstone of creating a bond between children and nature. Further augmenting the potential for children to experience an emotional connection to nature is the site's provision of spatial environments that support adult interaction with students. The partnered involvement of teachers and students in outdoor learning activities strengthens the Outdoor Learning Environment's potential to create lasting positive impressions on students regarding nature. The final site design promotes students' connection to nature through the inclusion of spatial environments that enable teachers and students to engage in joint outdoor learning activities.

The Garfield Elementary School Outdoor Learning Environment design also has the potential to impact American society as a whole because it addresses the root of many problems facing the citizens of the United States today. The problems caused by the devaluation children's interactions with nature include (but are not limited to) obesity, attention disorders, increased stress levels, social awkwardness, poor mental health, and lack of confidence in individual abilities. By designing spatial environments to accommodate a range of outdoor learning activities on the school site, students are given increased opportunities to develop a connection to local nature. It is my hope that by encouraging students to emotionally connect to nature, children will develop a land ethic that will guide them to assume the role of environmental stewards in their adult lives.

Project Relevance to Landscape Architecture

The three reasons that this project is relevant to contemporary landscape architecture and regional and community planning are: 1) Celebrating a perpetual idea through site design is an innovative form of commemoration in the public realm, 2) It attempts to attack the root of Nature-Deficit Disorder in children through nature-focused site design which, if demonstrated to be successful, could serve as an example for other school grounds' designs, and 3) Children could potentially grow to be more environmentally-concerned adults as a result of bonding with the nature in their school's Outdoor Learning Environment—which would give landscape architects, planners, and politicians a greater basis of public support to enact environmental protection policies.

Celebrating Nature

Commemorations are not new features to design. In fact, the human need to commemorate and memorialize has only increased in contemporary society. Today even trivial events or private individuals (who may or may not have impacted the public at large) are receiving public memorials. But are these commemorations and memorials meaningful? Do they carry significance in our lives and encourage us to remember our past? The truth is that memorials and commemorations are created for the living, not the deceased. As one generation of the living transitions into the next, the importance of past commemorations in society changes to fit the new ideals of the new population. Unlike memorials of events, people, or groups that will change in meaning over time, commemorating the human relationship with nature was, is, and will forever be significant. I believe that the children-nature bond is a worthy, even necessary, idea to commemorate in terms of the environmental education that it could offer to the youths of our nation. Furthermore, celebrating an idea that is timeless in its relevance to human life is a relatively innovative form of commemoration. The Garfield Elementary School Outdoor Learning Environment is a commemorative site that celebrates the timeless bond between children and nature. This site design proposal could act as a catalyst for other commemorative projects.

Nature-Focused Site Design for Schools

A nature-oriented school grounds design celebrating mankind's bond with ecology could serve as a gateway for children to experience and develop meaningful relationships with the environment. Opportunities to witness natural processes or learn about other biotic species through physical interactions in nature are limited to children in urban settlements. In part, this is due to the necessary travel required to experience nature, whether it be to certain locations within the city

or outside city limits. Both travel costs and time commitments hinder parents' abilities to make these interactions possible. Moreover, children's chances for meaningful exchanges with nature are exponentially lessened if they are from families of poverty—which only increases the economic stresses of travel. (In addition to travel-related issues, there are a multitude of other factors that reduce children's ability to interact with the outdoors including technology addiction, stranger danger fear, etc.) To combat the current lack of interaction with nature that is plaguing today's children in developed countries, public elementary school grounds should be designed so as to commemorate and celebrate the human bond with nature. Designers can combat Nature-Deficit Disorder in America's children by focusing on elementary school site design as the frontier for celebrating and commemorating the human relationship with nature. Creating an Environmentally-Conscious Populous

Garfield Elementary School—a Catalyst for Change

The implementation of a site design that commemorates the human-nature bond at Garfield Elementary School could ultimately result in a more environmentally-conscious generation of people who will support and enact policy changes to protect our environmental resources. The Outdoor Learning Environment project focuses on creating opportunities for children to interact with nature. Its success lies in the hope that the site will act as a foundation for children to have meaningful experiences with nature, sculpting their perceptions of the world through a lens of environmental understanding and consideration. Future decisions that these students make will then, hopefully, take the ecological concerns into account. This potential public support group would make it easier for landscape architects and planners to enact policy changes that would reduce negative human impacts upon the environment. The project's success in creating a populous of environmental stewards is dependent upon the ability of daily interactions within the Outdoor Learning Environment's spatial environments to generate a deep-seeded love of the land in students. If the project is ultimately constructed and proven to be successful in developing children's bond with nature, then it has the potential to act as a catalyst for similar projects to occur at other elementary and primary schools.

It is my hope that the Garfield Elementary School Outdoor Learning Environment be built. However, even if the project is not constructed, the supporting evidence describing the intended successes of this project may influence other similar design projects to occur. The goal of this book is to promote thoughtful site design projects in the future that offer children opportunities to interact with local ecology—thereby strengthening their appreciation for the natural environment.

Glossary

- Affordances—“are functionally significant properties of the environment which are defined by the relationship between the environment and an organism. For example, a tree affords climbing for a child only if its lower branches reach down to a child’s grasp” (Chawla, 2007, 150).
- Avifauna—all bird species
- Biosphere—is “the parts of the earth’s crust, waters, and atmosphere that support life” (Dictionary.com, 2012).
- Commemorate—means to “recall and show respect for something” (Oxford Dictionaries, 2012) and “to mark by some ceremony or observation” (Merriam-Webster, 2012).
- Conservation—“is the human effort to understand and preserve land health” (Leopold, 1966, 258).
- Children—refers to children who are between the ages of 4 and 12; elementary school-aged children.
- Environmental stewardship—“refers to the human responsibility to protect the environment through recycling, conservation, regeneration, and restoration” (National Environmental Policy Act, 2012).
- Fauna—all animal species
- Flora—all plant species
- Grounds—consists of landscape areas occupied by plants, turf, rocks, sand, or other natural materials
- Land Health—“is the capacity of the land for self-renewal” (Leopold, 1966, 258).
- Land Ethic—“reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land” (Leopold, 1966, 258).
- Loose Parts—“are materials that can be moved, carried, combined, redesigned, lined up, and taken apart and put back together in multiple ways” (Penn, 2013).
- Natural Capital—is “nature’s ability to renew and provide resources and services” (Wackernagel, et al., 2011, 103).
- Nature—“refers to the generalized idea of natural wildness such as biodiversity and abundance. Nature can refer to either a pile of rocks in a backyard to a rugged mountain ridge” (Louv, 2008, 8). (Also see the *What is Nature?* section on page 10.)

- Outdoor Wildlife Learning Site (OWLS) —“is a program sponsored by the Chickadee Checkoff of the Kansas Department of Wildlife, Parks, and Tourism. An OWLS is an outdoor environmental/ wildlife laboratory, at or near a school, consisting of one or more native habitat features. It is designed to attract native wildlife and to facilitate multi-discipline learning opportunities for students. The program involves several agencies and organizations interested in conservation education. An OWLS grant provides $2,000 for developing initial features” (Kansas Department of Wildlife, Parks, and Tourism, 2012).
- Paraprofessional Educator—“often referred to as an aide, is an education worker who is not licensed to teach, but performs many duties both individually with students and organizationally in the classroom. A paraprofessional works in support of the teacher” (Mauro, 2013).
- Sustainability—means “meeting the needs of present generations without jeopardizing the ability of future generations to meet their own needs by utilizing natural resources at rates that can be replenished” (European Commission, 2012).

III. References and Appendices

"'Nature' is what we see—

The Hill—the Afternoon—

Squirrel—Eclipse— the Bumble bee—

Nay—Nature is Heaven—

Nature is what we hear—

The Bobolink—the Sea—

Thunder—the Cricket—

Nay—Nature is Harmony—

Nature is what we know—

Yet have no art to say—

So impotent Our Wisdom is

To her Simplicity."

—Emily Dickinson's poem "Nature is what we see" from "The Complete Poems of Emily Dickinson" poetry collection first published in 1924.

References

Text References

AugustaGazette.com. (2012, July 14). A look inside the new Garfield Elementary School. *Augusta Daily Gazette*. Augusta Kansas. Retrieved from www.augustagazette.com/article/20120714/NEWS/307149955/0/SEARCH

AugustaGazette.com. (2007, December 20). Augusta BOE seeks facilities upgrade. *Augusta Daily Gazette*. Augusta Kansas. Retrieved from www.augustagazette.com/article/20071220/NEWS/312209999/0/SEARCH

Blizard, C. R., & Schuster, R. M. (2007). Fostering Children's Connections to Natural Places through Cultural and Natural History StorytellingFostering Children. Children, Youth and Environments, 17(4). Retrieved from http://www.jstor.org/stable/10.7721/chilyoutenvi.17.4.0171

Borgers, N., Leeuw, E. de, & Hox, J. (2000). Children as Respondents in Survey Research: Cognitive Development and Response Quality. Bulletin de Méthodologie Sociologique, 66, 60–75.

Brett, A., Moore, R. C., & Provenzo, E. F. (1993). The Complete Playground (1st ed.). Syracuse, New York: Syracuse University Press.

Broto, C. (2012). The Complete Book of Playground Design. Barcelona, Spain: Linksbooks.

Canada Mortgage and Housing Corporation (CMHC SCHL). (1976). Play Opportunities for School-Age Children: 6-14 Years of Age. Canada: Canada Mortgage and Housing Corporation.

Chawla, L. (2007). Childhood Experiences Associated with Care for the Natural World: A Theoretical Framework for Empirical Results. Children, Youth and Environments, 17(4). Retrieved from http://www.jstor.org/stable/10.7721/chilyoutenvi.17.4.0144 .

City-Data.com. (2012). Augusta, Kansas. Retrieved from www.city-data.com/city/Augusta-Kansas.html

Dictionary.com. (2012). Biosphere. Retrieved from http://dictionary.reference.com/browse/biosphere

Dioum, Baba. (1968). Speech presented at the International Union for Conservation of Nature, New Delhi, India.

Farlex. (2013). Hazard. The Free Dictionary. Retrieved from http://www.thefreedictionary.com/hazard

Farlex. (2013). Risk. The Free Dictionary. Retrieved from http://www.thefreedictionary.com/risk

Free Online Dictionary, Thesaurus, and Encyclopedia. (2012). *Nature*. Retrieved from www.thefreedictionary.com/nature

Frost, J. L., Brown, P.-S., Sutterby, J. A., & Thornton, C. D. (2004). *The Developmental Benefits of Playgrounds*. Maryland: Association for Childhood Education International.

European Commission. (2012). Sustainable Development. European Commission. Retrieved from ec.europa.eu/environment/eussd/

Handbill. (1869). Augusta, Butler Co., Kansas.

Kansas State Department of Education. (2012). 2011-2012 Selected School Statistics by Building. *Kansas State Department of Education*. Retrieved from http://www.ksde.org/Default.aspx?tabid=1870

Kansas State Department of Education. (2012). Free and Reduced Enrollment: 2011-2012 Elementary Totals. *Kansas State Department of Education*. Retrieved from http://www.ksde.org/Default.aspx?tabid=1870

Kansas Department of Wildlife, Parks, and Tourism. (2012). Outdoor Wildlife Learning Sites (OWLS). Retrieved from http://wwww.kdwpt.state.ks.us/news/Services/Education/Outdoor-Wildlife-Learning-Sites/OWLS-Information

Keeler, R. (2008). Natural Playscapes: Creating Outdoor Play Environments for the Soul. Redmond, Washington: Exchange Press.

Leopold, A. (1966). *A Sand County Almanac*. New York: Ballantine Books.

Louv, R. (2008). *Last Child in the Woods: Saving our Children from Nature-Deficit Disorder*. North Carolina: Algonquin books of Chapel Hill.

Mann, E. (2010, September 7). Augusta school ready for storms. *The Wichita Eagle*. Wichita, Kansas. Retrieved from www.kansas.com/2010/09/07/1481282/augusta-school-ready-for-storms.html

Mauro, T. (2013). What Is a Paraprofessional? About.com Children with Special Needs. Retrieved April 10, 2013, from specialchildren.about.com/od/specialeducation/g/parapro.htm

Merriam-Webster. (2008). Avifauna. Retrieved from www.merriam-webster.com/dictionary/avifauna

Merriam-Webster. (2008). Commemorate. Retrieved from www.merriam-webster.com/dictionary/commemorate

Merriam-Webster. (2008). Fauna. Retrieved from www.merriam-webster.com/dictionary/fauna

Merriam-Webster. (2008). Flora. Retrieved from www.merriam-webster.com/dictionary/fauna

Merriam-Webster. (2008). Mud. Retrieved from www.merriam-webster.com/dictionary/mud

Merriam-Webster. (2008). Nature. Retrieved from www.merriam-webster.com/dictionary/nature

Merriam-Webster. (2008). Rock. Retrieved from www.merriam-webster.com/dictionary/rock

Merriam-Webster. (2008). Sand. Retrieved from www.merriam-webster.com/dictionary/sand

Merriam-Webster. (2008). Water. Retrieved from www.merriam-webster.com/dictionary/water

Merriam-Webster Student Dictionary. (2007). Nature. Retrieved from http://www.wordcentral.com/cgi-bin/student?nature

Messervy, J. M. (1995). The Inward Garden: Creating a Place of Beauty and Meaning (pp. 25–35). Boston: Little, Brown, and Company.

National Center for Education Statistics. (2009). Enrollment in public elementary and secondary schools, by level, grade, and state or jurisdiction: Fall 2009. *Digest of Education Statistics*. Retrieved from nces.ed.gov/programs/digest/d11/tables/dt11_037.asp

National Environmental Policy Act. (2012). Resource Materials: A Presentation on Environmental Stewardship. Retrieved from http://www.nepa.gov.jm/student/resource-material/pdf/Environmental_Stewardship.pdf

Natural Resources Conservation Service (NRCS). “What Is Soil?,” 2012. soils.usda.gov/education/facts/soil.html.

Oxford Dictionaries. (2012). Commemorate. Oxford University Press. Retrieved from oxforddictionaries.com/definition/english/commemorate

Oxford Dictionaries. (2012). Nature. Oxford University Press. Retrieved from http://oxforddictionaries.com/us/definition/american_english/nature?q=nature

Peet, B. (1970). The Wump World. New York: Houghton Mifflin Company.

Penn State Extension. (2013). Loose Parts: What does this mean? The Basics for Caring for Children in Your Home. Retrieved from http://betterkidcare.psu.edu/TIPS/tips1107.pdf

Rogers, C. S., & Sawyers, J. K. (1988). Play in the Lives of Children. Washington D.C.: National Association for the Education of Young Children.

Seuss, D. (1999). The Lorax. New York: Random House Inc.

Sendak, M. (1963). Where the Wild Things Are. New York: Harper Collins Publishers.

Stallard, J. (2012). The Lorax is Back! Project Learning Tree. Retrieved from http://www.plt.org/the-lorax-is-back-

Turan, K. (2009, October 16). Where the Wild Things Are: The adaptation of Maurice Sendak's book expands on the boorish Max--to its detriment. Los Angeles Times. Retrieved from http://articles.latimes.com/2009/oct/16/entertainment/et-wild-things16 U.S. Consumer Product Safety Commission. (2013). Tips for Public Playground Safety. Retrieved April 26, 2013, from http://www.cpsc.gov//PageFiles/115867/Playfct.pdf

Wackernagel, M., Kitzes, J., Moran, D., Goldfinger, S., & Thomas, M. (2006). The Ecological Footprint of cities and regions: comparing resource availability with resource demand. *Environment and Urbanization*, *18*(1), 103–112.

Figure References

All figures are by author, except for the following listed in this section. Citations for figures created by author utilizing base data from other sources are also listed.

Figure 2.10—Avifauna

Kansasphoto. (2009). Yellow_rumped_warbler. Retrieved April 10, 2013, from http://www.flickr.com/photos/34022876@N06/3517536038/in/photostream/

Figure 2.14—Fostering Environmental Stewardship

Darien Library. (2008). Environmental_stewardship. Retrieved April 26, 2013, from http://www.flickr.com/photos/darienlibrary/2536633631/sizes/o/in/photostream/

Figure 2.19—Sensorial Activity

Sonin, J. J. (2009). Child_smelling_flowers. Retrieved April 10, 2013, from http://www.flickr.com/photos/juhansonin/3584496703/in/photostream/

Figure 2.36—Potgieterstraat Moguls

Collin, B. (2010). Potgieterstraat. Retrieved April 10, 2013, from http://www.flickr.com/photos/24oranges/5316413000/sizes/o/in/photostream/

Figure 2.37—Natural Materials

Rees, S. (2008). Garden_City. Retrieved April 10, 2013, from http://www.flickr.com/photos/stephen_rees/2272286329/sizes/o/in/photostream/

Figure 2.38—BUGA Paths

Orphanjones. (2009). BUGA. Retrieved April 10, 2013, from http://www.flickr.com/photos/orphanjones/3729450112/sizes/o/in/photostream/

Figure 3.01—Augusta Kansas Location

Christner, C. (2013). Augusta Kansas Location. Source map: Mapbox. Retrieved February 15, 2012 from https://tiles.mapbox.com/newmap#7.00/37.921/-98.234

Figure 3.04—Building Layout

Christner, C. (2013). Building Layout. Source data: PBA Architects' AutoCAD base image "Floor Plan-Overall" created July 27, 2011.

Figure 3.06—Garfield Prior to Redevelopment in 2010.

Christner, C. (2013). Garfield Prior to Redevelopment in 2010. Source map: Bing Maps. Garfield Elementary School in Augusta, Kansas. Retrieved September 17, 2012 from http://www.bing.com/maps/

Figure 3.07—Garfield During Redevelopment in 2012.
Christner, C. (2013). Garfield During Redevelopment in 2012. Source map: Google Maps. Garfield Elementary School in Augusta, Kansas. Retrieved September 17, 2012 from https://maps.google.com/

Figure 3.08—Garfield's Activity Areas
Christner, C. (2013). Garfield's Activity Areas. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.09—Activity Area A
Christner, C. (2013). Activity Area A. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.10—Outdoor Wildlife Learning Site (OWLS)
Christner, C. (2013). Outdoor Wildlife Learning Site (OWLS). Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.11—Activity Area B
Christner, C. (2013). Activity Area B. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.12—Activity Area C
Christner, C. (2013). Activity Area C. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.13—Activity Area D
Christner, C. (2013). Activity Area D. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.14—Grade Level Changes
Christner, C. (2013). Grade Level Changes. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.15—Garfield Elementary School Location
Christner, C. (2013). Garfield Elementary School Location. Source map: Mapbox. Retrieved February 15, 2012 from https://tiles.mapbox.com/newmap#14.00/37.6895/-96.9712

Figure 3.20—Wind Exposure
Christner, C. (2013). Wind Exposure. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.21—Solar Access
Christner, C. (2013). Solar Access. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.22—Shade Study
Christner, C. (2013). Shade Study. Source data: PBA Architects' Revit building model "Garfield Elem Site."

Figure 3.23—Water Drainage
Christner, C. (2013). Water Drainage. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.24—Leftover Spaces
Christner, C. (2013). Leftover Spaces. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.25—Community Access
Christner, C. (2013). Community Access. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.26—Pedestrian Circulation
Christner, C. (2013). Pedestrian Circulation. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.27—Vehicular Circulation and Crosswalks
Christner, C. (2013). Vehicular Circulation and Crosswalks. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.28—Physical Activity
Christner, C. (2013). Physical Activity. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.29—Creative Activity
Christner, C. (2013). Creative Activity. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.30—Sensorial Activity
Christner, C. (2013). Sensorial Activity. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.31—Solitary Activity
Christner, C. (2013). Solitary Activity. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.32—Physical Social Activity
Christner, C. (2013). Physical Social Activity. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.31—Non-Physical Social Activity
Christner, C. (2013). Non-Physical Social Activity. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.54—Spatial Meaning
Christner, C. (2013). Spatial Meaning. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.58—Site Plan with Trees
Christner, C. (2013). Site Plan with Trees. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.59—Site Plan with Building Interior
Christner, C. (2013). Site Plan Building Interior. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.61—Pedestrian Circulation
Christner, C. (2013). Pedestrian Circulation. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.62—Gathering Spaces
Christner, C. (2013). Gathering Spaces. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.63—Land Archetype Locations
Christner, C. (2013). Land Archetype Locations. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.64—Vegetative Areas
Christner, C. (2013). Vegetative Areas. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 3.65—Phasing Implementation
Christner, C. (2013). Phasing Implementation. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Figure 5.01—Early Childhood/Kindergarden Stationary Play Equipment Model
Russell, M. B. (2012). Garfield New Playground. Little Tikes Commercial Play Systems (LTCPS) and Recreation Resource Inc.

Figure 5.02—Early Childhood/Kindergarden Stationary Play Equipment Plan
Russell, M. B. (2012). PlayArea1. Little Tikes Commercial Play Systems (LTCPS) and Recreation Resource Inc.

Figure 5.03—First through Fifth Grade Stationary Play Equipment Model
Russell, M. B. (2012). Garfield Elementary. Little Tikes Commercial Play Systems (LTCPS) and Recreation Resource Inc.

Figure 5.04—First through Fifth Grade Stationary Play Equipment Plan
Russell, M. B. (2012). PlayArea1. Little Tikes Commercial Play Systems (LTCPS) and Recreation Resource Inc.

Figure 5.05—First through Fifth Grade Stationary Play Equipment Model with Grading
Russell, M. B. (2012). PlayArea1. Little Tikes Commercial Play Systems (LTCPS) and Recreation Resource Inc.

Figure 5.55—Planting Plan
Christner, C. (2013). Planting Plan. Source data: PBA Architects' AutoCAD base image "Site Arch'L Plan-Phase 2" created July 27, 2012.

Table References

All tables are by author. Citations for tables created by author utilizing base data from other sources are listed.

Table 3.34—Outdoor Learning Activity Descriptions

Christner, C. (2013). Outdoor Learning Activity Descriptions. Source data: *The Complete Book of Playground Design* by Carles Broto.

Table 3.35—Land Archetype Descriptions

Christner, C. (2013). Land Archetype Descriptions. Source data: *The Inward Garden: Creating a Place of Beauty and Meaning* by Julie Moir Messervy.

Table 3.36—Land Archetypes Encourage Outdoor Learning Activities

Christner, C. (2013). Land Archetypes Encourage Outdoor Learning Activities. Source data: *The Complete Book of Playground Design* by Carles Broto and *The Inward Garden: Creating a Place of Beauty and Meaning* by Julie Moir Messervy.

Table 5.56—Grass Descriptions and Climate Requirements

Christner, C. (2013). Grass Descriptions and Climate Requirements. Source data: *http://www.kansasnativeplants.com/guide/plant_search.php*

Table 5.58—Shade and Water Herbaceous Plant Descriptions and Climate Requirements

Christner, C. (2013). Shade and Water Herbaceous Plant Descriptions and Climate Requirements. Source data: *http://www.kansasnativeplants.com/guide/plant_search.php*

Table 5.60—Partial Sun Herbaceous Plant Descriptions and Climate Requirements

Christner, C. (2013). Partial Sun Herbaceous Plant Descriptions and Climate Requirements. Source data: *http://www.kansasnativeplants.com/guide/plant_search.php*

Table 5.62— Sun Herbaceous Plant Descriptions and Climate Requirements

Christner, C. (2013). Partial Sun Herbaceous Plant Descriptions and Climate Requirements. Source data: *http://www.kansasnativeplants.com/guide/plant_search.php*

Table 5.67—Shrub Descriptions and Climate Requirements

Christner, C. (2013). Shrub Descriptions and Climate Requirements. Source data: *http://www.kansasnativeplants.com/guide/plant_search.php*

Table 5.69—Tree Descriptions and Climate Requirements

Christner, C. (2013). Tree Descriptions and Climate Requirements. Source data: *http://www.kansasnativeplants.com/guide/plant_search.php*

Appendix A

Existing Stationary Play Equipment

Courtesy of Little Tikes Commercial Play Systems (LTCPS), Recreation Resource Inc., and PBA Architects

Garfield Elementary School, Augusta, KS

Early Childhood/Kindergarten Stationary Play Equipment Area

The stationary playground equipment modeled below has already been incorporated into the Garfield Elementary School Early Childhood/ Kindergarten playground. The swingset is currently in storage and will be soon be implanted onsite.

Featured images are courtesy of Little Tikes Commercial Play Systems (LTCPS) and Recreation Resource Inc.

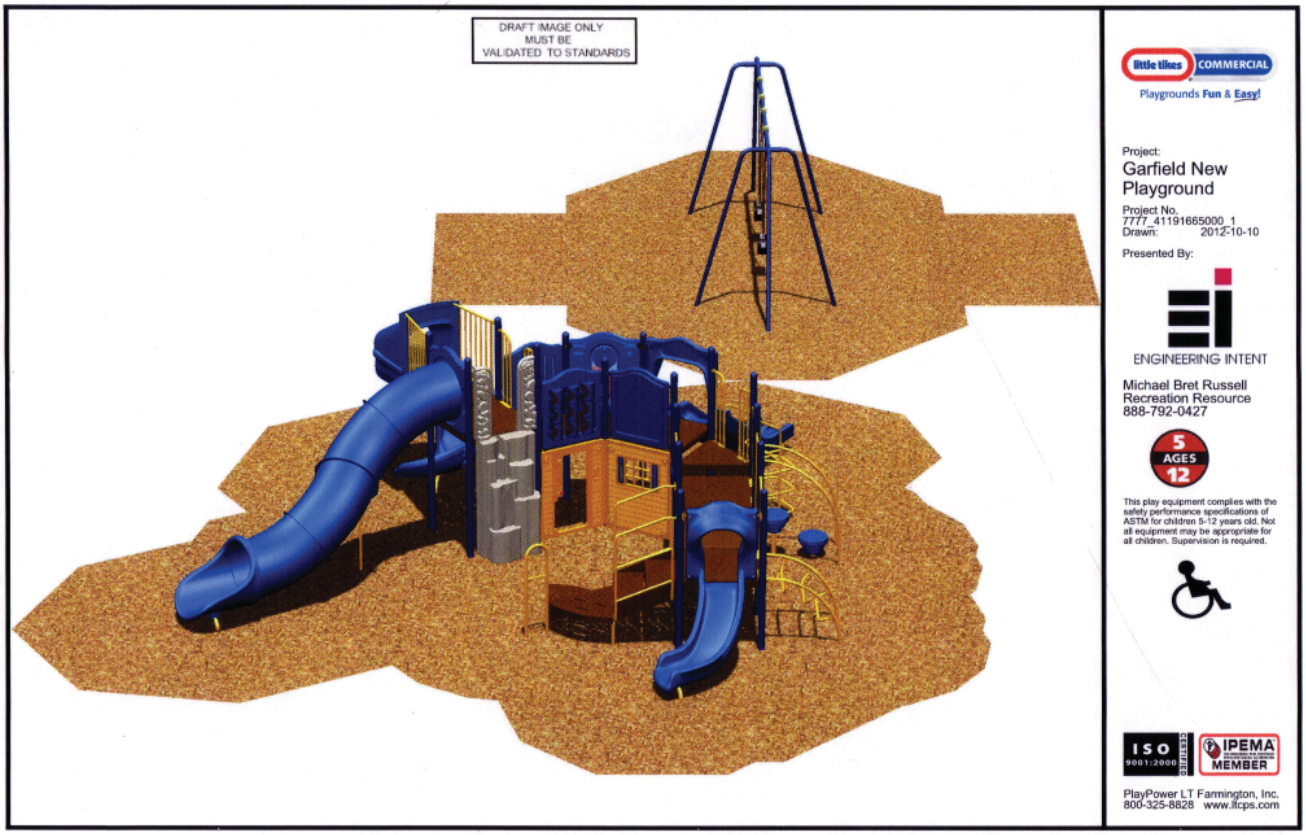


Figure 5.01—Early Childhood/Kindergarden Stationary Play Equipment Model
This stationary play equipment has already been incorporated into Garfield's Early Childhood/Kindergarten Activity Area

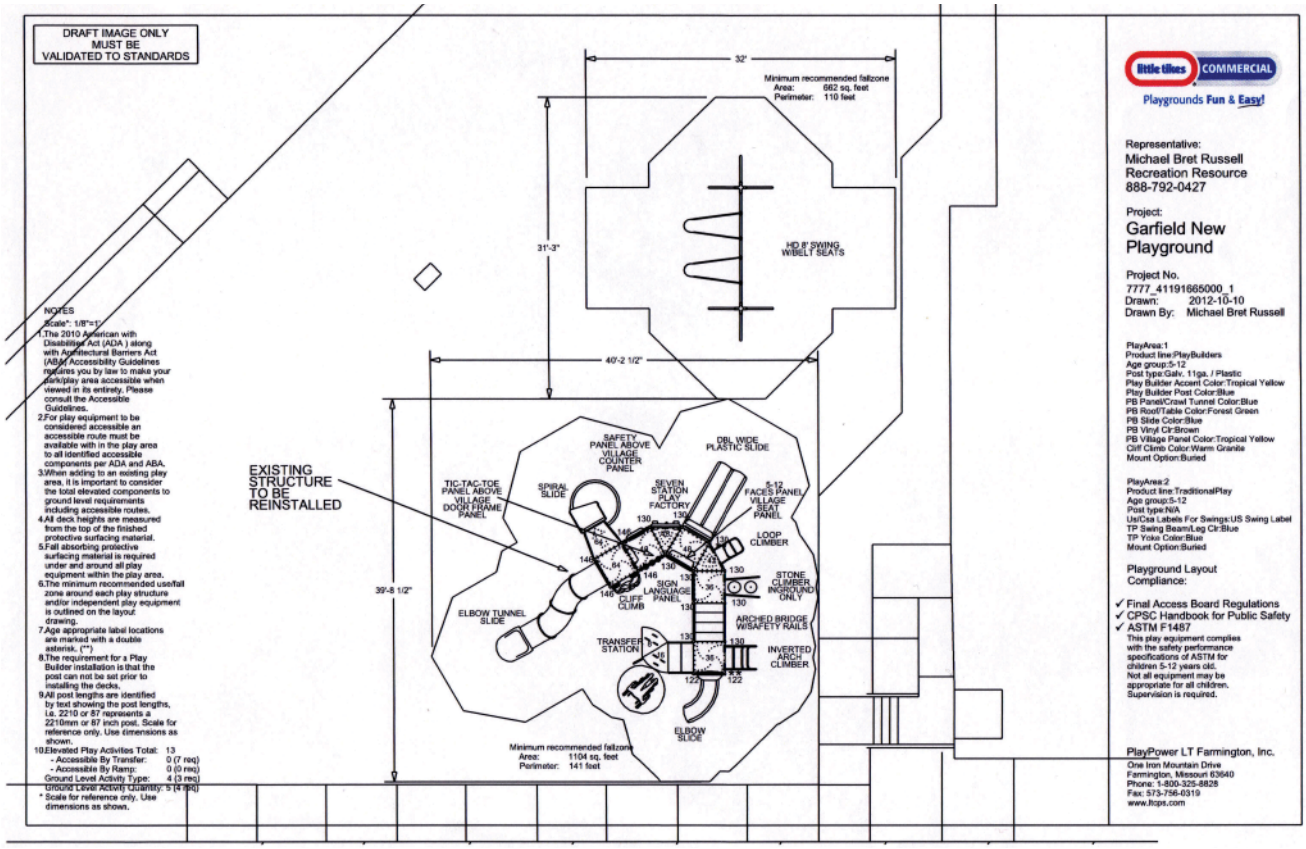


Figure 5.02—Early Childhood/Kindergarden Stationary Play Equipment Plan
The play equipment is located near the southeast corner of the Early Childhood/Kindergarden Activity Area

First-Fifth Grade Stationary Play Equipment

The stationary playground equipment modeled below has already been incorporated into the Garfield Elementary School First-Fifth Grade playground.

Featured images are courtesy of Little Tikes Commercial Play Systems (LTCPS) and Recreation Resource Inc.

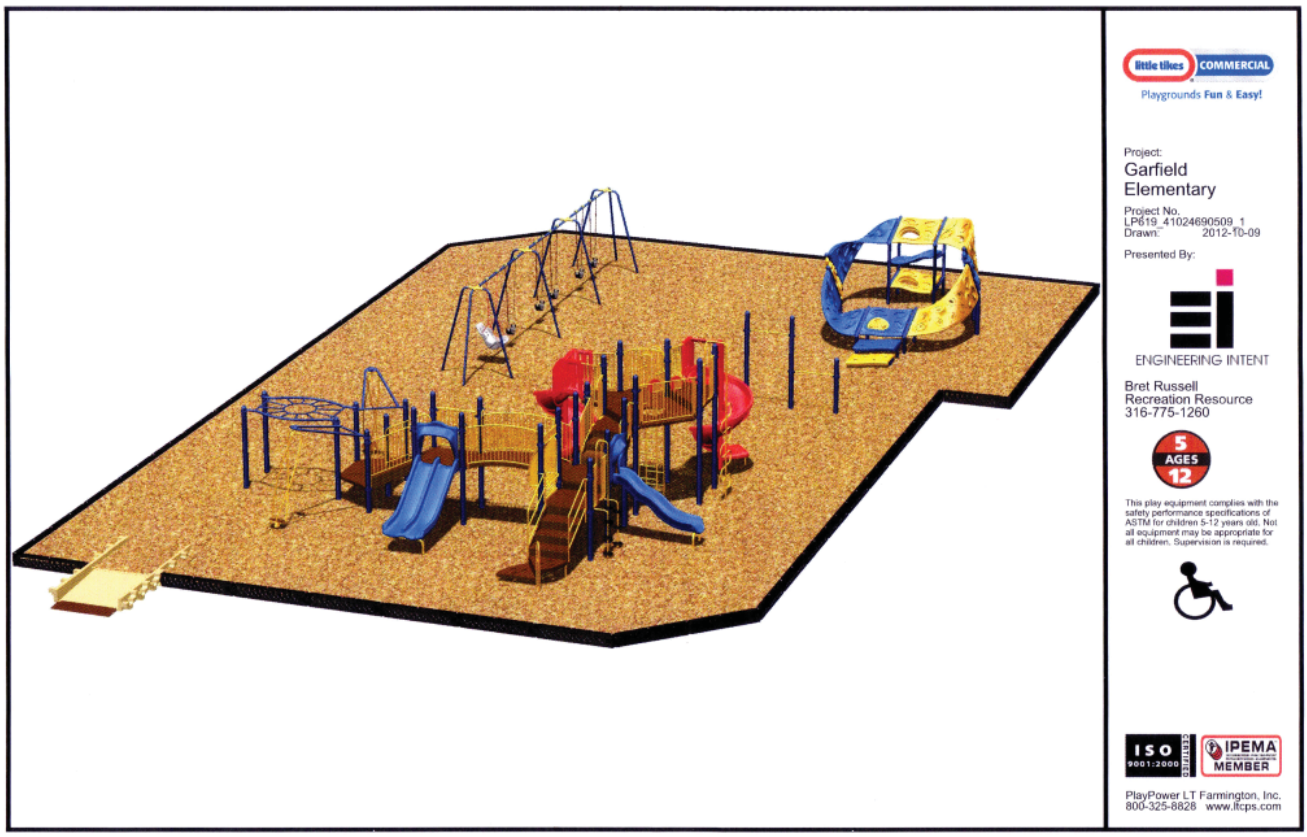


Figure 5.03—First through Fifth Grade Stationary Play Equipment Model
This stationary play equipment has already been incorporated into Garfield's First through Fifth Grade Activity Area

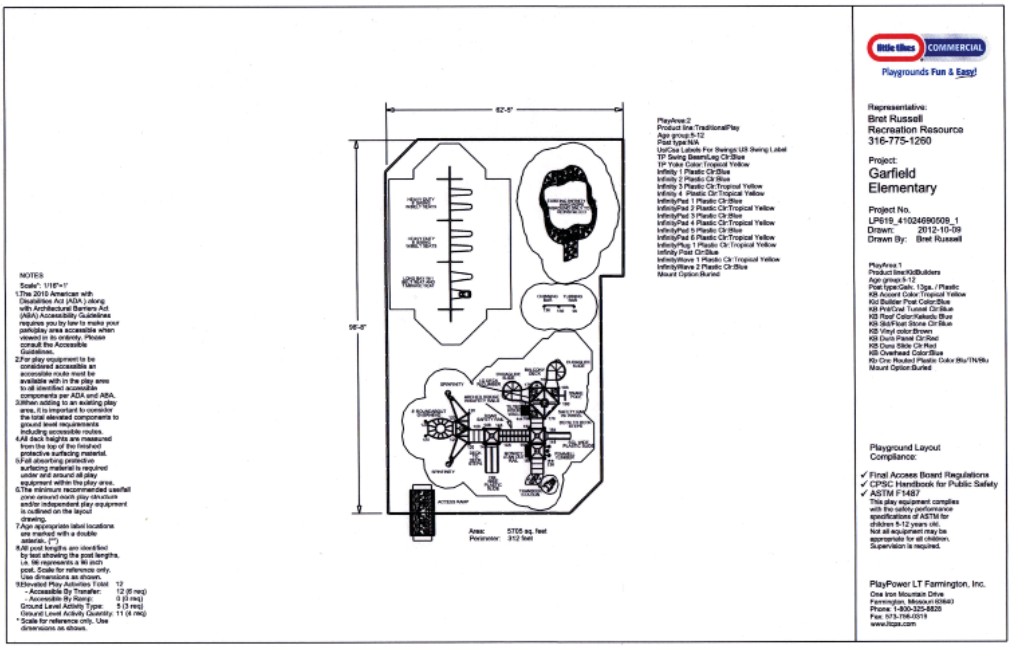


Figure 5.04—First through Fifth Grade Stationary Play Equipment Plan
The play equipment is located near the southwest corner of Garfield's First through Fifth Grade Activity Area

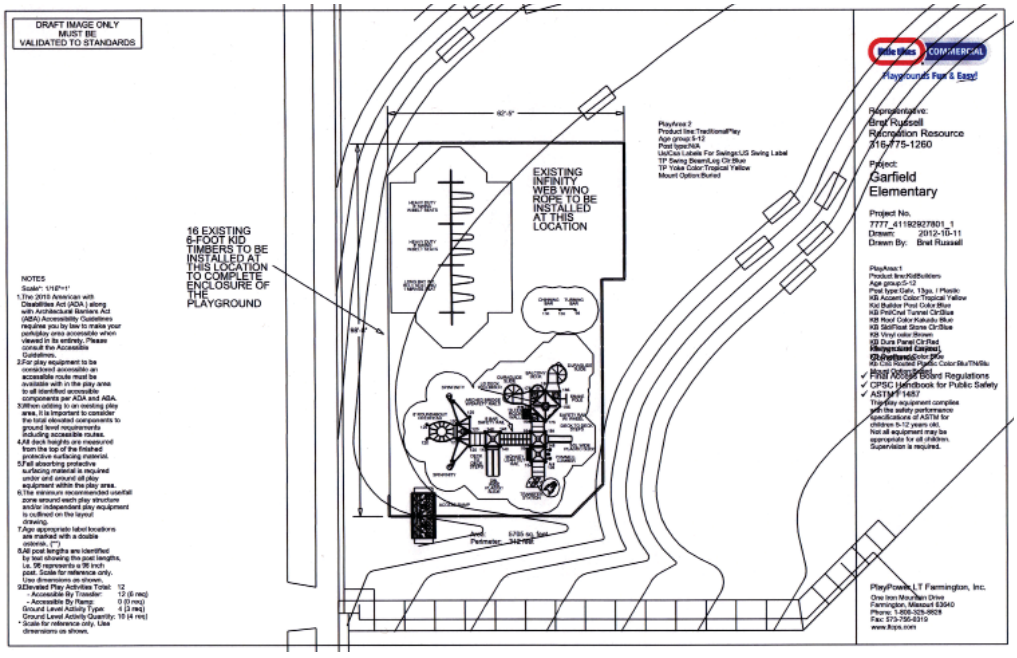


Figure 5.05—First through Fifth Grade Stationary Play Equipment Plan with Grading
A four foot sloped terrace borders the stationary play equipment to the east

Appendix B

Land Archetype Sketches

Meadow

Figure 5.06—Meadow Land Archetype
The meadow land archetype creates the sense of being immersed in a space

Burrow

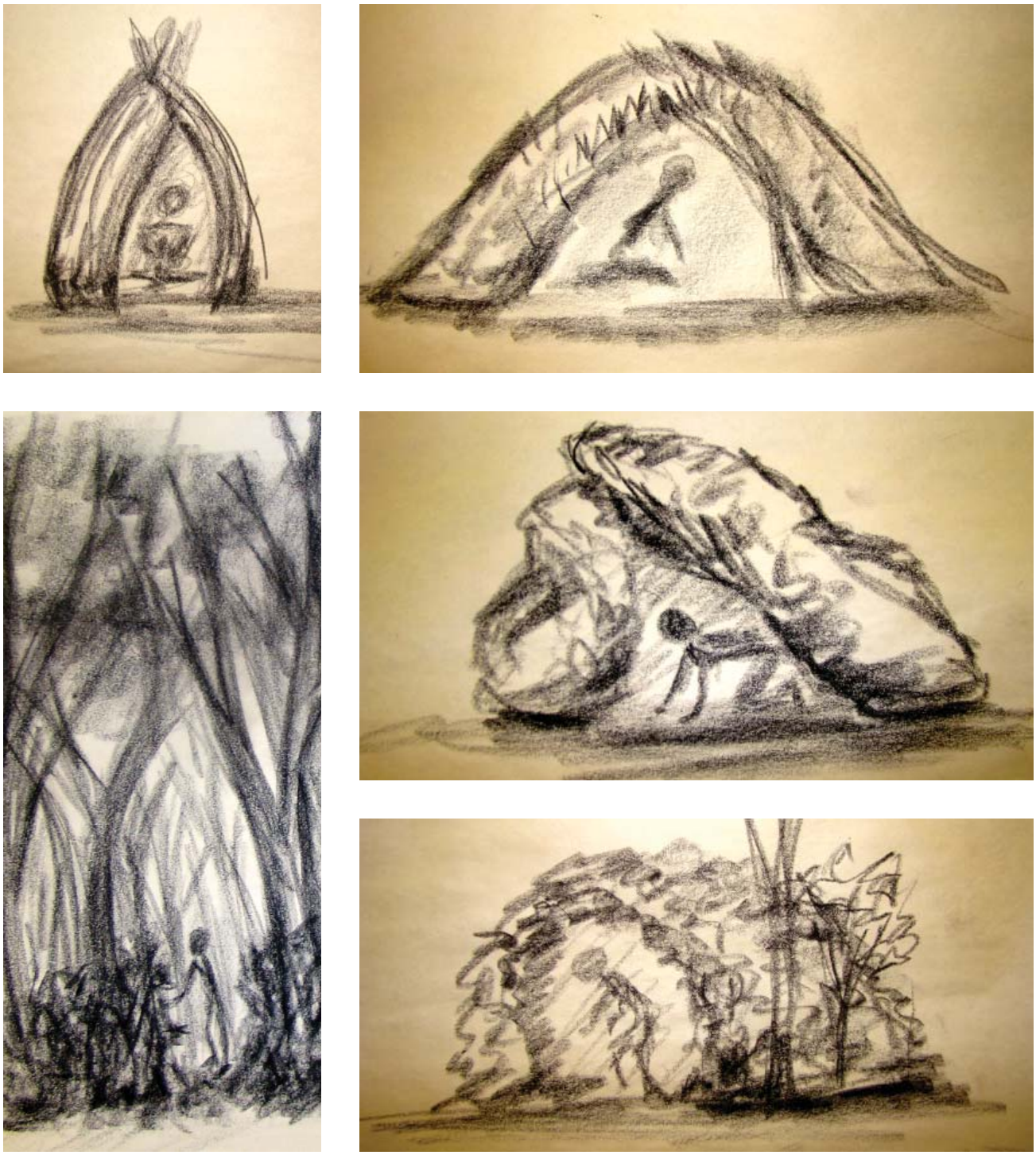


Figure 5.07—Burrow Land Archetype
The burrow land archetype creates the sense of being enclosed in a space with a small view outward

Cove

Figure 5.08—Cove Land Archetype
The cove land archetype creates the sense of having one's back protected with views outward and is less enclosed than the burrow

Bluff

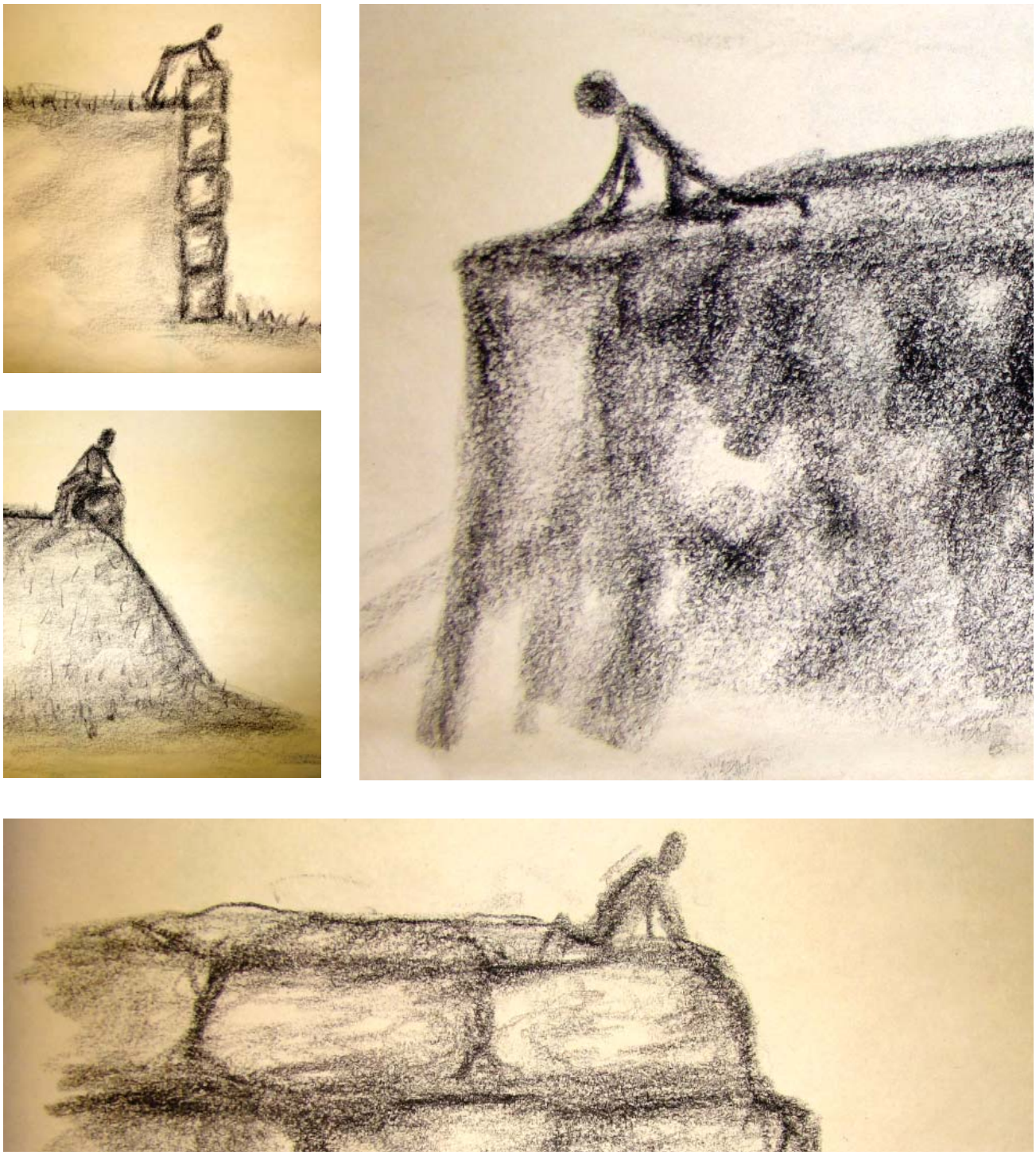
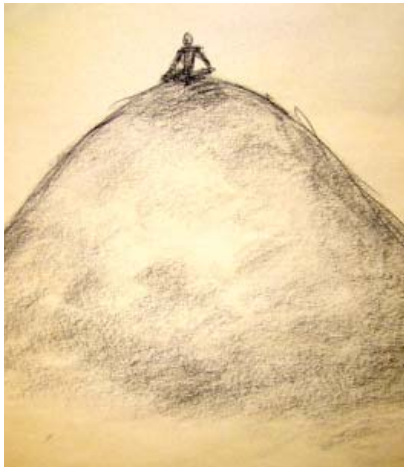


Figure 5.09—Bluff Land Archetype
The bluff land archetype creates the sense of standing on a raised edge while overlooking surrounding lands

Outcropping

Figure 5.10—Outcropping Land Archetype
The outcropping land archetype creates the sensation of standing on a raised object that juts out from the surrounding space

Cuesta



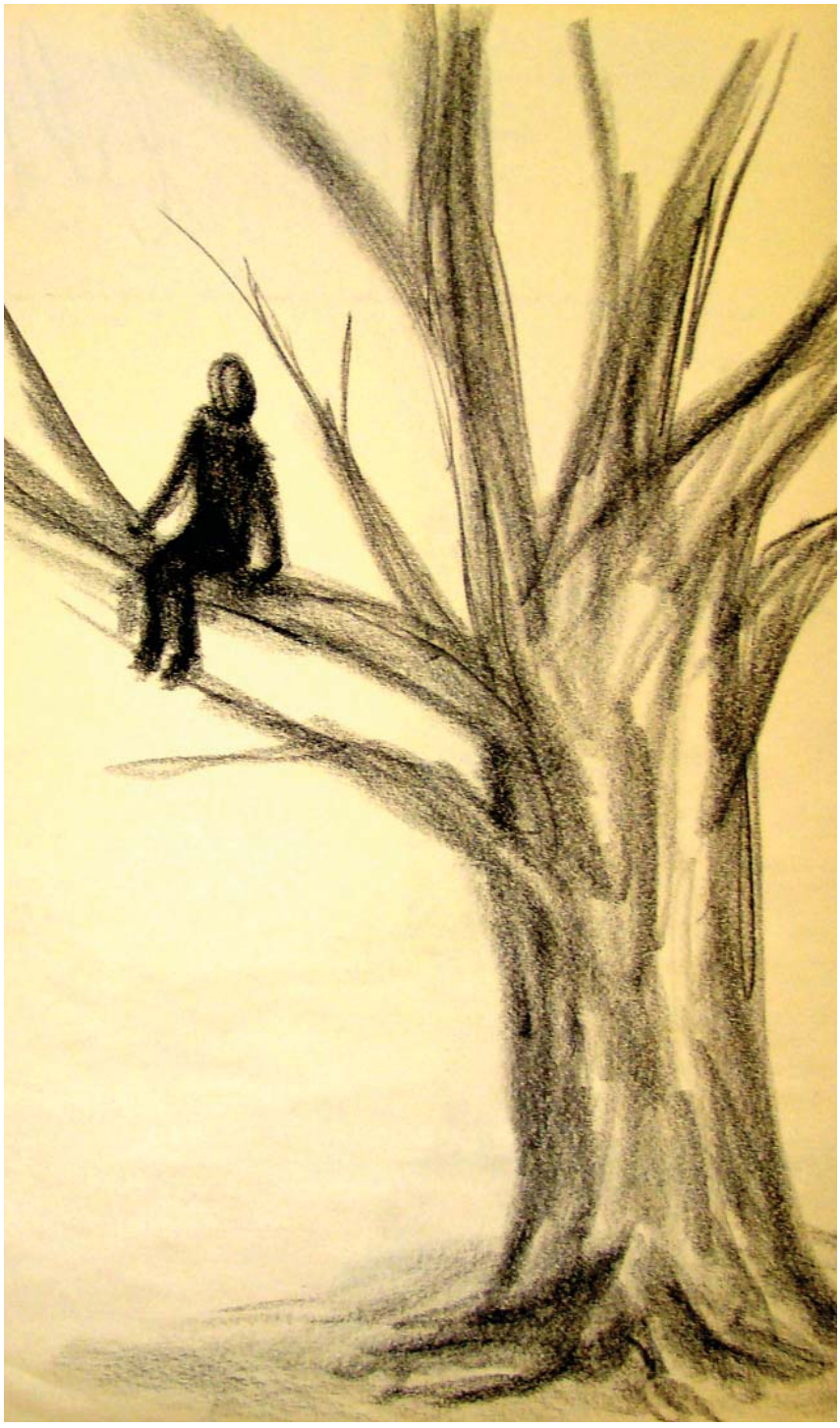


Figure 5.11—Cuesta Land Archetype
The cuesta land archetype creates the sensation of standing on a high place that offers expansive views of surrounding lands

Sky

Figure 5.12—Sky Land Archetype
The sky land archetype creates the sensation of vertical movement through space; the feeling of flight or effects of gravity

Path A path takes on the characteristics of the land archetype through which it passes.

Figure 5.13—The Path
The path adopts the traits of the land archetypes that it is passing through

Appendix C

Creative Design Activity

Fourth Grade students

Garfield Elementary School, Augusta, KS

Thursday March 7th, 2013 from 1:00PM to 2:00PM

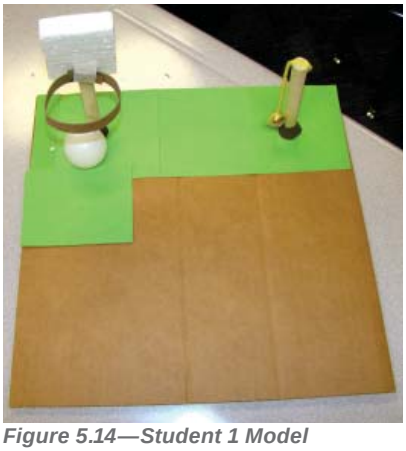


Figure 5.14—Student 1 Model
Features a basketball goal and tether ball

Student 1

"I made a cannon ball station, tether ball, and a basketball goal and you can shoot through the hoop."

Figure 5.15—Student 2 Model
Features a castle park with water

Student 2

"Mine is a castle park. This is the sand area and this is the pond and this is water. This is a tree that you would play on. I can play on the teeter-totter with my friends."

Figure 5.16—Student 3 Model
Features a water exploration structure

Student 3

"Right here on the top I was about to make a ladder that you would go up and right here would be a slide then you slide down and go into the water."

Student 4

"Mine I made a zip line that you could either ride down on or you could climb on and I made a target for practice, for target shooting (or for bow shooting)."

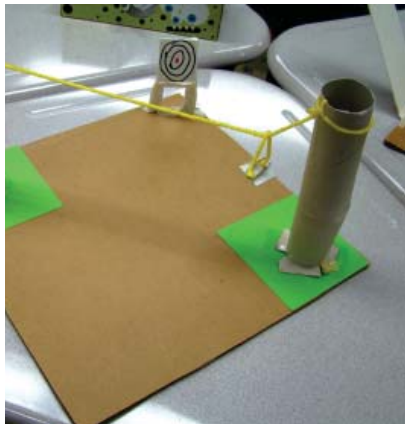


Figure 5.17—Student 4 Model
Features a zip line and a target

Student 5

"Right here is a cannonball place and I have a little pond that has a fish in it and you can climb up on the slide and go into it and if you want to sit and enjoy the view right here that has a thing to make shade for you."

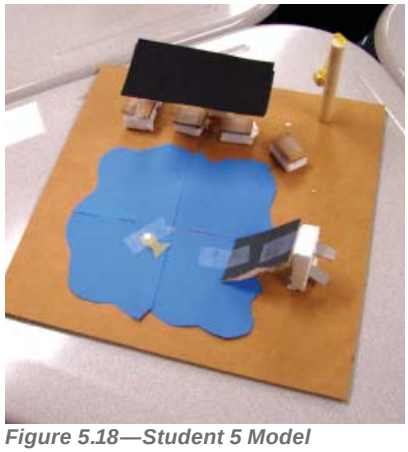


Figure 5.18—Student 5 Model
Features a fish pond and picnic area

Student 6

"Basket ball goal and here's my ball and this is the ball and it goes through like that and this is where you can see whose winning and whose losing."

Figure 5.19—Student 6 Model
Features a basketball goal

Figure 5.20—Student 7 Model
Features water, tether ball, and a table

Student 7

"This is a tether ball pole and this is four square and this is where you can sit and this is a table. This is a pond with fish in it."

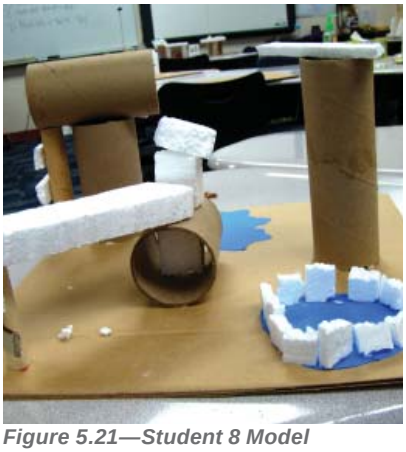


Figure 5.21—Student 8 Model
Features a water park and skating rink

Student 8

"I made a water park and a roller skating rink. This is a diving board that you come and jump into the pool and I made a slide right here. And this is another ladder that you can climb up and walk across the ladder and go off the lower diving board and this is a roller skating rink that I made."

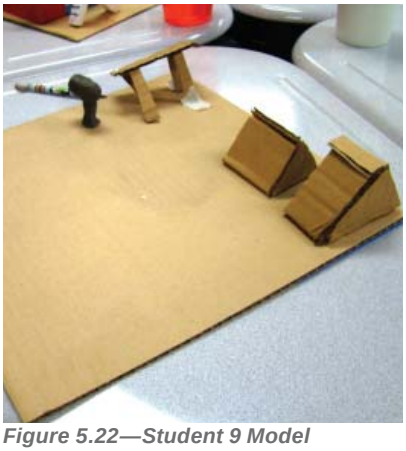


Figure 5.22—Student 9 Model
Features a camp site and barbecue grill

Student 9

"I made a camp site with some tents and a picnic table and a grill."

Student 10

"This is a merry-go-round I made, monkey bars, and a rock-crawling thing."

Figure 5.23—Student 10 Model
Features a rock climbing wall

Student 11

"Mine is a water park and it has a swimming pool with a water slide and there's a tree house over here with a diving board and it has a roof to slide down when you want to leave. And there's this thing that you can sit under when you get hot. And then this is the siren that tells you when the pool is open and when it's closed."

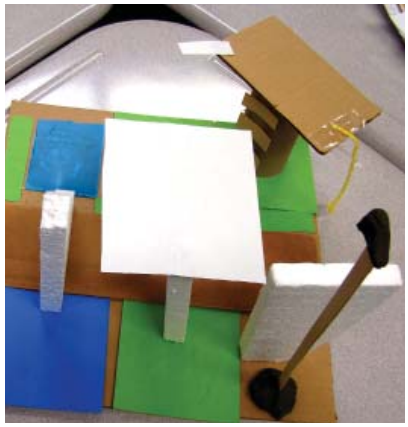


Figure 5.24—Student 11 Model
Features water and a tree house

Student 12

"This—I haven't made that much—but this is like a little ball, like a big ball. And this is like a chess area where you can play chess. And this is a rock climbing area."

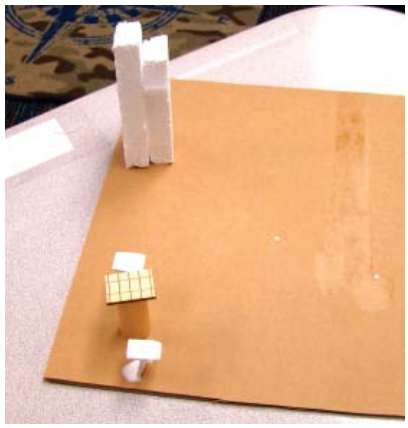


Figure 5.25—Student 12 Model
Features a chess table

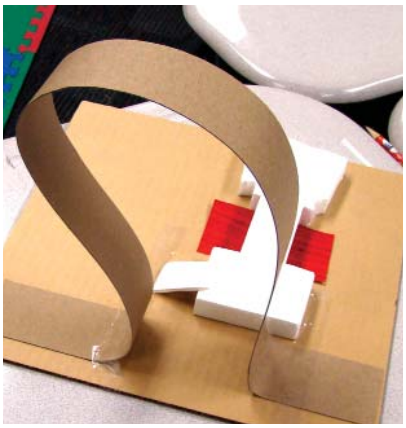


Figure 5.26—Student 13 Model
Features a grand entrance

Student 13

"This is the entrance part of it and you go from here and go up this and there's like melting oil and you try to go across—you go from this end to the other—and if you fall you go into water and if you get to here you can climb down and retry . And if they drain out the water you can stand in this place."

Figure 5.27—Student 14 Model
Features a climbing wall

Student 14

"This is a wall that you climb. This is a flag and a pole that you climb on—you don't have to sit on it. This is a pole that you can sit on, climb on, or draw on."

Figure 5.28—Student 15 Model
Features two sidewalks

Student 15

"I built this. There's two sidewalks here. One was going to be tether ball and one was going to be basketball and this was going to be here. And then I was going to have people walk around playing tetherball and basketball."

Student 16

“Here’s a sidewalk and it leads to an airplane. And these are flying things that you can go inside.”

Figure 5.29—Student 16 Model
Features an airplane

Student 17

“This is a water slide. I’m not done with it. But the water comes up here and jumps down into the water bowl.”

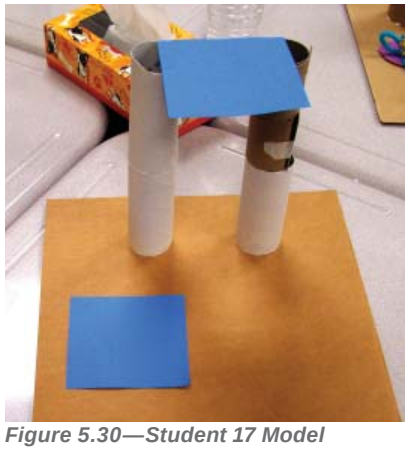


Figure 5.30—Student 17 Model
Features a water slide

Student 18

“This is a skate park and here are the bumpy parts where the skaters come and here is a ramp they have to jump over this and these are obstacles and then these are the things that they spin around inside. And I was going to put more of these right here but I just ran out of time.”

Figure 5.31—Student 18 Model
Features a skate park

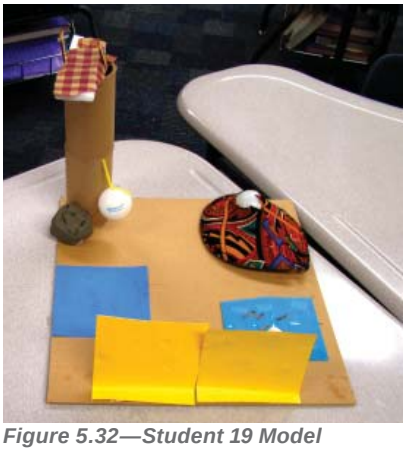


Figure 5.32—Student 19 Model
Features a trampoline and climbing wall

Student 19

"This is a trampoline and you can go down it. This is my trampoline, four square, and this is a rock wall. And this is tether ball and you can climb up this and go off the diving board into the water."

Figure 5.33—Student 20 Model
Features a burrow-like structure

Student 20

"This is the Garfield School. That's what the G. S. stands for and I made, stuck, a picture in the back of it."

Figure 5.34—Student 21 Model
Features a fence, lake, and tether ball

Student 21

"This is a tether ball. And there's a butterfly. And there is a lake in there and there is a fence on this end. There is a little place right there that you can sit on."

Student 22

"This is the White house. Up here is the flag and I just put these people here just because. I was going to try to make George Washington—stuff like that."

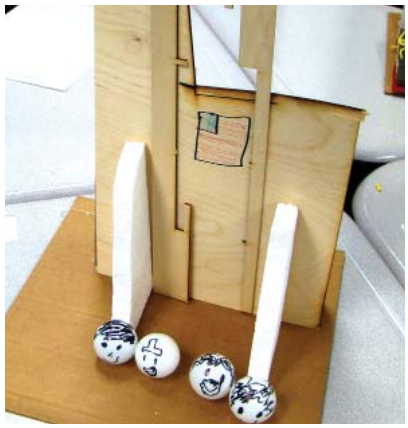


Figure 5.35—Student 22 Model
Features a cuesta-like form with people

Student 23

"This is a water park and here's a diving board and water shoots out of the tubes."

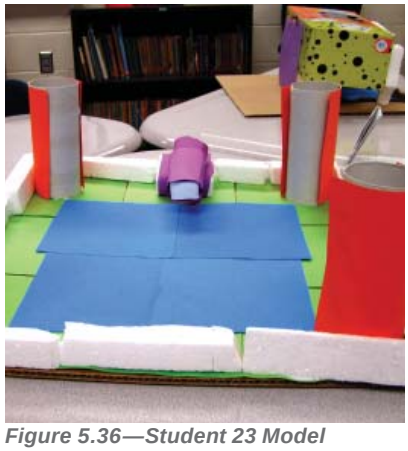


Figure 5.36—Student 23 Model
Features water and a diving board

Student 24

"This is my new dog Lily. We haven't gotten her yet. This is her leash. I was going to make a tail but I couldn't figure out how to do it."

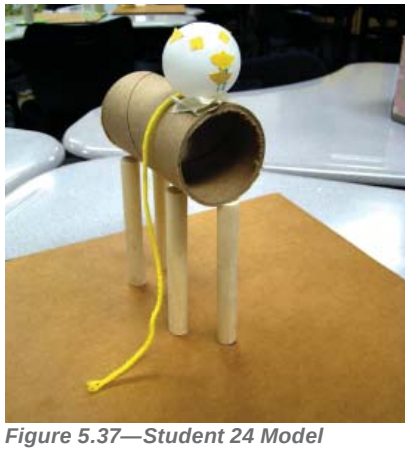


Figure 5.37—Student 24 Model
Features a pet dog with leash

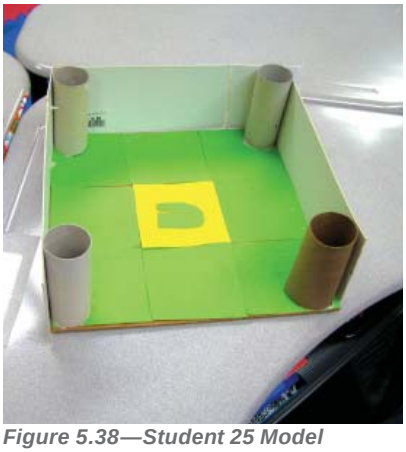


Figure 5.38—Student 25 Model
Features a football stadium

Student 25

"This is a football stadium. It is a football stadium for the Green Bay Packers which is my second favorite team."

Figure 5.39—Student 26 Model
Features a hockey skating rink

Student 26

"This is a thing that you would just have to paint the grass blue. And then over here if you want to ice skate you can over here."

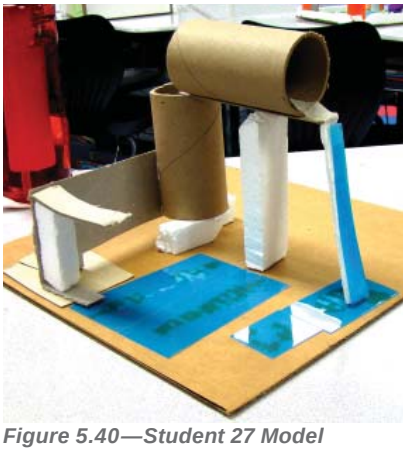


Figure 5.40—Student 27 Model
Features a water park with a slide

Student 27

"This is a water slide. This is a whirlpool leading up to the diving board."

Student 28

"This is a fort and we have a person here and we have binoculars here and shade to keep them cool. And you can relax and eat and drink."

Figure 5.41—Student 28 Model
Features a fort with binoculars

Student 29

"This is a playground and here's a swing that you can swing on and here's a big rock over here and this is just something that you can climb on and go down here and have shade when it's hot outside. And over on the other side over here is a slide that you can do and this is just a decoration."

Figure 5.42—Student 29 Model
Features a swing, rock, and shade

Student 30

"This is a ball park except it's not baseball. There's a slide right here where the ball slides down and goes into the water. This is tetherball and this launches the ball into the water."

Figure 5.43—Student 30 Model
Features ball park with water

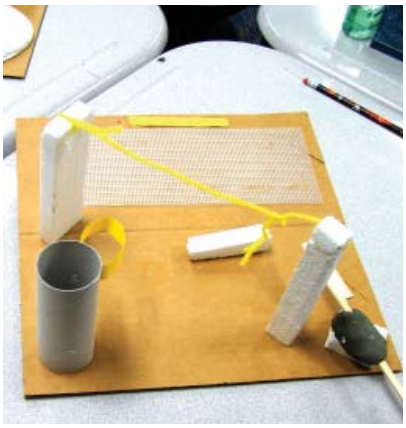


Figure 5.44—Student 31 Model
Features a zip line and skating rink

Student 31

"Here a made a skating rink. Over here I made teeter-totters. Right here I made a zip line where you just hang right here and slide across. This is a basketball goal. And if you just want to sit and relax I made a bench."

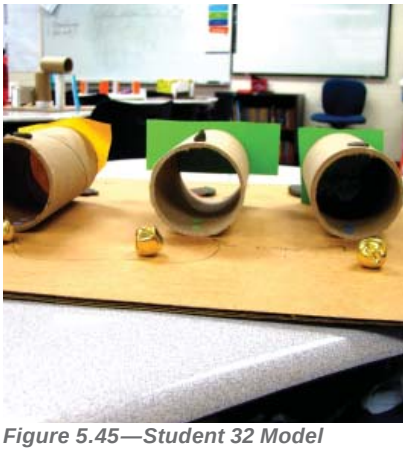


Figure 5.45—Student 32 Model
Features a tunnel game with music

Student 32

"This is the tunnel of singing. There are three tunnels here. Each of these has their own different color of decorated tube. So what you've got to do is grab this hold it at the end and go like this while you are walking into one of the caves. You have to sing the jingle bells song and if you stop, ring one, and look back run singing jingle bells backwards. And if you stop at the yellow one right here you have to turnaround walk back and sing jingle bells backwards. And if you go through the one that has the little hole in here then you have to keep doing it slide under the thing and step over the little puddle. And if anybody actually passes here, it's going to be a big one."

Figure 5.46—Student 33 Model
Features a park with skating ducks

Student 33

"This is a park. This is a duck. This is a skating park; these are skating. They are skating ducks; they are brothers."

Student 34

“There’s the tether ball with the rock wall around it.”

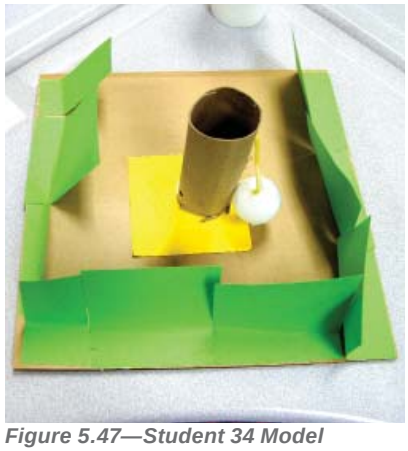


Figure 5.47—Student 34 Model
Features a tether ball and a rock wall

Student 35

“This is a fire pole. This is a tunnel and this was a tire swing.”

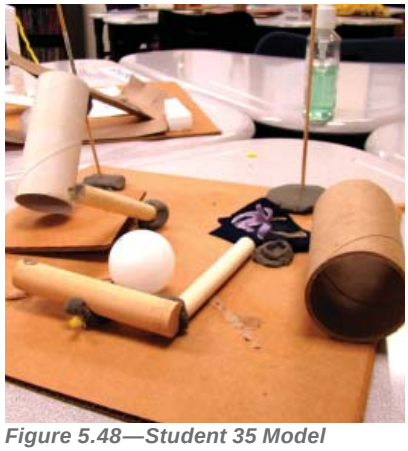


Figure 5.48—Student 35 Model
Features a fire pole and tunnel

Student Responses Favoring Play Equipment and Site Amenities=37

- 18 references to traditional (stationary) play equipment
- 9 references to adventure play equipment
- 10 references to site amenities

	Traditional Play Equipment						
Student	Basketball	Football	Teeter totter	Four Square	Monkey Bars	Merry-Go-Round	Tether Ball
1	X						X
2			X				
3							
4							
5							X
6	X						
7				X			X
8							
9							
10					X	X	
11							
12							
13							
14							
15	X						X
16							
17							
18							
19				X			
20							
21							X
22							
23							
24							
25		X					
26							
27							
28							
29							
30							X
31	X		X				
32							
33							
34							X
35							
TOTAL	4	1	2	2	1	1	7
	18 traditional play equip						

Table 5.49—Traditional Play Equipment References
Students made 18 references to traditional playground equipment in presentations ot their models

Student	Adventure Equipment			Site Amenities		
	Zip Line	Rock Climbing	Target Shooting	Shade	Seating	Table
1						
2						
3						
4	X		X			
5				X	X	
6						
7						
8						
9					X	X
10		X				
11				X		
12		X			X-chess	
13						
14		X				
15						
16						
17						
18						
19		X				
20						
21						
22						
23						
24						
25						
26						
27						
28		X		X		
29				X		
30						
31	X				X	
32						
33						
34		X				
35						
TOTAL	2	6	1	4	5	1
	9 adventure playground equip			**10 site amenities**		

Table 5.50—Adventure Equipment and Site Amenities References
Students made 9 references to adventure playground equipment and 10 to site amenities in presentations ot their models

Student Responses Favoring Movement=36

- 5 references to general circulation (such as paths)
- 7 references to horizontal movement (such as skating)
- 24 references to vertical movement (such as ladders and slides)

	Circulation			Horizontal Movement
Student	Entry	Path	Fence	Skating
1				
2				
3				
4				
5				
6				
7				
8				X
9				
10				
11				
12				
13	X			X
14				
15		X		
16		X		
17				
18				X
19				
20				
21			X	
22				
23				X
24				
25				
26				X-hockey
27				
28				
29				
30				
31				X
32	X			
33				X
34				
35				
TOTAL	2	2	1	7
	5 Circulation-Movement			7 Horizontal movement

Table 5.51—Circulation and Horizontal Movement References
Students made 5 references to circulation and 7 to horizontal movement in presentations ot their models

Student	Vertical Movement				
	Ladder	Slide	Jump	Climb	Ride
1					
2					
3	X	X			
4				X	X
5		X			
6					
7					
8		X	X	X	
9					
10					
11		X		X	
12					
13				X	
14					
15					
16					X-flying
17			X		
18	X-ramp		X		
19		X	X-trampoline		
20					
21					
22					
23			X		
24					
25					
26					
27			X		
28			X		
29		X			X-swing
30					
31		X			
32					
33					
34					
35					X-swing & fire pole
TOTAL	**2**	**7**	**7**	**4**	**4**
	24 Vert. movement				

Table 5.52—Vertical Movement References
Students made 24 references to vertical movement, such as swings, in presentations ot their models

Student Responses Favoring Nature=40

- 22 references to elements of nature
- 8 references to landforms
- 5 references to imaginative features
- 5 references to the senses

	Elements of Nature				Landforms		Imaginative
Student	Water	Sand	Plants	Wildlife	Mountain	Cave	Imaginative
1							
2	X	X	X				X-castle
3	X				X		
4							
5	X			X			
6							
7	X			X			
8	X						
9						X-tents	
10							
11	X		X				
12							X-big ball
13							
14							X
15							
16							X-airplane
17	X						
18						X-tunnels	
19	X						
20						X-cave	
21	X			X			
22					X-white house		
23	X						
24				X-dog			
25							
26							
27	X						
28	X				X-fort		
29							
30	X						X-ball park
31							
32	X					X-tunnels	
33				X			
34							
35						X-tunnels	
TOTAL	14	1	2	5	3	5	5
	22 Nature				8 Landforms		5 Imaginative

Table 5.53—Elements of Nature, Landform, and Imaginative References
Students made 22 references to nature, 8 to landforms, and 5 to imagination in presentations ot their models

	Senses		
Student	Food	Sound	Color
1			
2			
3			
4			
5			
6			
7			
8			
9	X		
10			
11		X	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			X
24			
25			
26			
27			
28	X		
29			
30			
31			
32		X	
33			
34			
35			
TOTAL	2	2	1
	5 Senses		

Table 5.54—References to the Senses
Students made 5 references to the sensory qualities of space in presentations ot their models

Appendix D

Planting Design

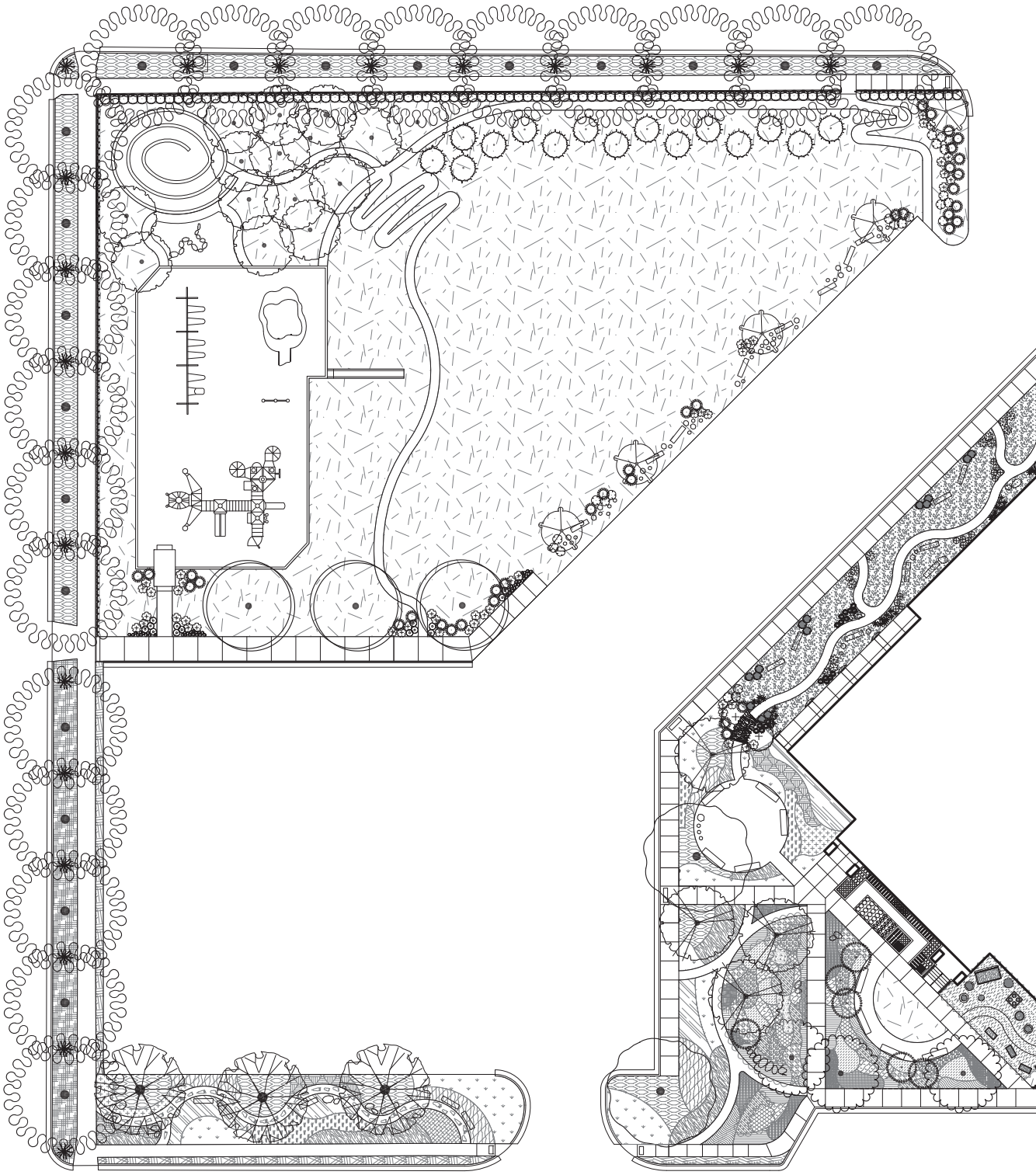
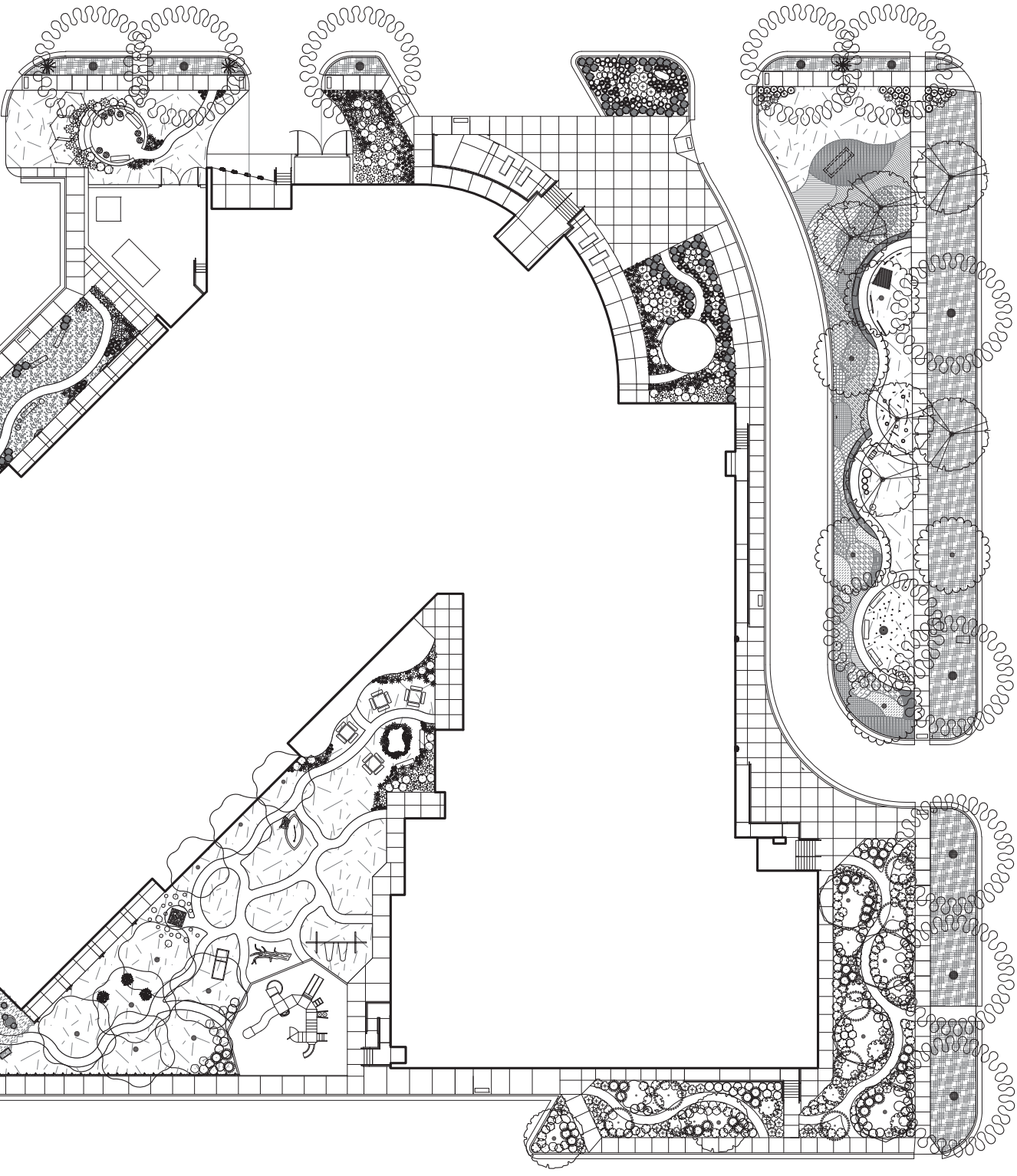


Figure 5.55—Planting Plan
Primarily native plants are specified for implementation in the planting design scheme for Garfield. Specific quantities and plant light and water needs for each recommended plant are listed in the tables on the following pages.



Grass Descriptions and Climate Requirements

The starred names are the grasses utilized in the planting plan palette for Garfield Elementary School.

Soil	Small (1 foot or less)	Medium (1-3 feet)	Large (3 feet or more)
	Full Sun Grasses		
Dry (Spring)	*Foxtail Barley Scribners Panicgrass *Long-stolon Sedge	Orchardgrass	
Dry (Summer)	Bearded Flatsedge Hairy Grama *Purple Threeawn	*Broomsedge Bluestem Junegrass *Little Bluestem *Nodding Muhly *Prairie Dropseed Silver Bluestem Side-Oats Grama	*Porcupine Grass
Dry (Fall)	*Purple Lovegrass	Arrow Feather Threeawn Mexican Muhly Purple Top	Gama Grass
Medium		Canadian Wildrye Marsh Muhly Western Wheatgrass	Big Bluestem Gama Grass Indiangrass
	Partial Sun Grasses		
Soil	*Small (1 foot or less)*	*Medium (1-3 feet)*	*Large (3 feet or more)*
Medium	Deertongue Panicgrass	American Beakgrass	
	Shade Grasses		
Soil	*Small (1 foot or less)*	*Medium (1-3 feet)*	*Large (3 feet or more)*
Dry (Spring)		Bottlebrush Sedge Cluster Sedge	
Dry (Summer)		*Bottlebrush Grass	

Table 5.56—Grass Descriptions and Climate Requirements
All grasses recommended for the school are native to Kansas. Soil moisture and sunlight requirements as well as bloom period and plant sizes are listed in this table.

Grass Schedule

The number of plants and types of container (such as seeds or one gallon buckets) that need to be purchased is listed below.

PART-SHADE_GRASS_PLANT_SCHEDULE

SYMBOL	QTY	COMMON NAME / BOTANICAL NAME	CONT
	3,306 sf	Curveleaf Hypnum Moss / Hypnum curvifolium	moss
	4,441	Bottlebrush Grass / Hystrix patula	flat @ 12" oc

SUN_GRASS_PLANT_SCHEDULE

SYMBOL	QTY	COMMON NAME / BOTANICAL NAME	CONT
	562	Broomsedge Bluestem / Andropogon virginicus	1 gal
	409	Purple Threeawn / Aristida purpurea	1 gal
	133	Long-stolon Sedge / Carex inops	1 gal
	39,067 sf	Bermuda Grass (TURF) / Cynodon dactylon	seed
	1,485	Purple Love Grass / Eragrostis spectabilis	1 gal
	5,725 sf	Purple Lovegrass and Foxtail Barley / Grass Mix	seed
	756 sf	Foxtail Barley / Hordeum jubatum	seed
	2,159	Porcupine Grass / Miscanthus sinensis `Strictus`	1 gal
	364	Nodding Muhly / Muhlenbergia bushii	1 gal
	760 sf	Little Bluestem Grass / Schizachyrium scoparium	seed
	257 sf	Prairie Dropseed / Sporobolus heterolepis	seed

Table 5.57—Grass Schedule

All grasses are ornamental except Bermuda Grass, which is the turf groundcover for the site and is tolerant of drought as well as both shade and sun. Bermuda Grass is not listed on the table to the left. Moss is non-native and is not listed on Table 5.56 Grass Descriptions and Climate Requirements. Curveleaf Hypnum Moss requires shade and moist soils. Refer to the Planting Plan figure on the previous page in order to see the locations of each of these grasses.

Shade and Water Herbaceous Plant Descriptions and Climate Requirements

The starred names are the plants utilized in the planting plan palette for Garfield.

Shade and Water Herbaceous Plants			
Soil	***Small (1 foot or less)***	***Medium (1-2 feet)***	***Large (2 feet or more)***
Moist (Spring)	Puttyroot Virginia Waterleaf	Fragrant Bedstraw Red Columbine Virginia bluebells	
Moist (Summer)		Blue Phlox	American Bellflower Cutleaf Coneflower Eastern Purple Coneflower Sweet Joe-Pye Wingstem
Moist (Fall)		Drummond's Aster	
Wet (Spring)	*Bloodroot Cutleaf Toothwort False Rue Anemone Rattlesnake Fern Southern Bladder Fern Spotted Geranium *Yellow Lady's Slipper Yellow Violet		
Wet (Summer)	Field Horsetail	*Horsetail Reed Grass Smooth Scouring-Rush	Maryland Figwort Pale Touch-Me-Not *Great Solomon's Seal *Spotted Jewelweed Sweet Coneflower Woodland Petunia
Wet (Fall)		*Wild Ageratum *White Gentian	

Table 5.58—Partial Sun Herbaceous Plant Descriptions and Climate Requirements
All herbaceous plants recommended for the school are native to Kansas. Soil moisture and sunlight requirements as well as bloom period and plant sizes are listed in this table.

Shade and Water Herbaceous Plant Schedule

The number of plants and types of container (such as seeds) that need to be purchased is listed below.

WATER_SHADE_PLANT_SCHEDULE

SYMBOL	QTY	COMMON NAME / BOTANICAL NAME	CONT
	5	Wild Ageratum / Conoclinium coelestinum	seeds @ 6" oc
	5	Yellow Lady`s Slipper / Cypripedium parviflorum	flat @ 12" oc
	16	Horsetail Reed Grass / Equisetum hyemale	3 gal
	7	White Gentian / Gentiana alba	seeds @ 6" oc
	6	Spotted Jewelweed / Impatiens capensis	seeds @ 6" oc
	9	Great Solomon`s-Seal / Polygonatum biflorum commutatum	flat @ 12" oc
	5	Bloodroot / Sanguinaria canadensis	flat @ 12" oc

Table 5.59—Shade and Water Herbaceous Plant Schedule
All herbaceous plants are ornamental. Refer to to Figure 5.55—Planting Plan in order to see the locations of each of these plants.

Partial Sun Herbaceous Plant Descriptions and Climate Requirements

The starred names are the plants utilized in the planting plan palette for Garfield.

	Partial Sun Herbaceous Plants		
Soil	***Small (1 foot or less)***	***Medium (1-3 feet)***	***Large (3 feet or more)***
Medium (Spring)	*Virginia Waterleaf	*Purple Coneflower *Canadian Columbine	
Soil	*Small (1 foot or less)*	*Medium (1-3 feet)*	*Large (3 feet or more)*
Medium (Summer)		Blue Phlox Starry Campion Virginia Knotweed White Snakeroot	Hairy Sunflower *Sweet/Savannah Joe-Pye Weed
	Shade Herbaceous Plants		
Soil	***Small (1 foot or less)***	***Medium (1-3 feet)***	***Large (3 feet or more)***
Dry (Spring)	*Woolly Blue Violet *Dutchman's Breeches Ebony Spleenwort *White Fawn Lily	*Prairie Alum Root Rock Larkspur *Virginia Bluebells	
Dry (Summer)		Hoary Ticktrefoil Hog Peanut *Tall Thimbleweed White Avens	Largebract Ticktrefoil Pointed-leaf Ticktrefoil *Tall Bellflower
Dry (Fall)	*Fall Coralroot Orchid		*Aster drummondi

Table 5.60—Partial Sun Herbaceous Plant Descriptions and Climate Requirements
All herbaceous plants recommended for the school are native to Kansas. Soil moisture and sunlight requirements as well as bloom period and plant sizes are listed in this table.

Partial Sun Herbaceous Plant Schedule

The number of plants and types of container (such as seeds) that need to be purchased is listed below.

PART-SHADE HERBACEOUS PLANT SCHEDULE

SYMBOL	QTY	COMMON NAME / BOTANICAL NAME	CONT
	679	Canadian Columbine / Aquilegia canadensis	seeds @ 6" oc
	676	Purple Coneflower / Echinacea purpurea	seeds @ 6" oc
	552	Sweet Joe Pye / Eupatoriadelphus pupureus	seeds @ 6" oc
	58	Tall Thimbleweed / Anemone virginiana	flat @ 12" oc
	108	Canadian Columbine / Aquilegia canadensis	seeds @ 6" oc
	25	Aster drummondii / Aster drummondii	seeds @ 6" oc
	20	Tall Bellflower / Campanula americana	seeds @ 6" oc
	113	Fall Coralroot Orchid / Corallorhiza odontorhiz	flat @ 12" oc
	117	Dutchman`s Breeches / Dicentra cucullaria	seeds @ 6" oc
	60	Purple Coneflower / Echinacea purpurea	seeds @ 6" oc
	116	White Fawn Lily / Erythronium albidum	seeds @ 6" oc
	20	Savannah Joe-Pye Weed / Eupatorium purpureum	seeds @ 6" oc
	53	Prairie Alum Root / Heuchera richardsonii	seeds @ 6" oc
	20	Virginia Waterleaf / Hydrophyllum virginianum	flat @ 12" oc
	26	Virginia Bluebells / Mertensia virginica	bulbs @ 12" oc
	176	Woolly Blue Violet / Viola sororia	seeds @ 6" oc

Table 5.61—Partial Sun Herbaceous Plant Schedule
All herbaceous plants are ornamental. Refer to Figure 5.55—Planting Plan in order to see the locations of each of these plants.

Sun Herbaceous Plant Descriptions and Climate Requirements

The starred names are the plants utilized in the planting plan palette for Garfield.

Full Sun Herbaceous Plants			
Soil	***Small (1 foot or less)***	***Medium (1-3 feet)***	***Large (3 feet or more)***
Dry (Spring)	Clammy Ground Cherry	Blue Wild Indigo	Virginia Bunchflower
	*Dakota Mock Vervain	Cream Wild Indigo	
	*Field Pussytoes	Large-flower beardtongue	
	Fringed Puccoon	Mild Water Pepper Smartweed	
	Hoary Puccoon	Plains Larkspur	
	*Prairie Violet	Showy Beardtongue	
	*Rose Verbena	Western Yarrow	
	Small Skullcap	Wild Hyacinth (angusta)	
	Yellow Stargrass	Wild Hyacinth (scilloides)	
	Bread-root Scurf-pea		
	*Wild Blue Phlox		
Soil	***Small (1 foot or less)***	***Medium (1-3 feet)***	***Large (3 feet or more)***
Dry (Summer)	Narrowleaf Verbena	Big Flower Coreopsis	Ashy Sunflower
	Scaly Gayfeather	Blacksamson Coneflower	Baldwin Ironweed
	Fringe-leaf Ruellia	Buckley Beardtongue	Blue Sage
	Ground-plum Milkvetch	*Butterfly Milkweed	Common Milkweed
		Germander	Compass Plant
		Hairy Four O'clock	Illinois Ticktrefoil
		Narrowleaf Milkweed	Maximilian Sunflower
		Nuttall's Death Cama	Panicled Ticktrefoil
		Pale Coneflower	Stiff Sunflower
		Pale Spike Lobelia	White Wild Indigo
		*Yellow Prairie Coneflower	Willow Leaf Sunflower
		Prairie Phlox	Bush Morning-Glory
		Purple Prairie Clover	*Bergamot
		Round Prairie Clover	Round-head Bush-clover
		Showy Ticktrefoil	Long-flower Butterfly-weed
		Silverleaf Scurfpea	
		Slender Bush Clover	
		Spring Lady's Tresses	
		Topeka Coneflower	
		*Cobaea Beardtongue	
		White Four-O'clock	
		white prairie clover	
		Wild Four-O'clock	
		Woolly Verbena	
		Grooved Flax	

Full Sun Herbaceous Plants			
Soil	***Small (1 foot or less)***	***Medium (1-3 feet)***	***Large (3 feet or more)***
Dry (Fall)	*Fall Aster	*Rough Blazing Star	Smooth blue aster
	Silky Aster	Dotted Gayfeather	Willowleaf Aster
		Downy Gentian	Common Sunflower
		Eastern Dotted Gayfeather	
		Great Plains Lady's Tresses	
		Nodding Lady's Tresses	
		Sky Blue Aster	
		Slender Lady's Tresses	
		Tuberous Indian Plantain	
Soil	***Small (1 foot or less)***	***Medium (1-3 feet)***	***Large (3 feet or more)***
Medium (Spring)	Wild Strawberry	Golden Alexanders	
Medium (Summer)		Horehound	Canada Milkvetch
		Mint-leaf Beebalm	Gray-headed Coneflower
		Ohio Spiderwort	
		Purple Milkweed	
Medium (Fall)		White Sage	New England Aster

Table 5.62—Sun Herbaceous Plant Descriptions and Climate Requirements
All herbaceous plants recommended for the school are native to Kansas. Soil moisture and sunlight requirements as well as bloom period and plant sizes are listed in this table.

Sun Herbaceous Plant Schedule

The number of plants and types of container (such as seeds) that need to be purchased is listed below.

SUN HERBACEOUS PLANT SCHEDULE

SYMBOL	QTY	COMMON NAME / BOTANICAL NAME	CONT
	78	Field Pussy-toes / Antennaria neglecta	seeds @ 6" oc
	559	Butterfly Milkweed / Asclepias tuberosa	seeds @ 6" oc
	799	Fall Aster / Aster oblongifolius	flat @ 12" oc
	480	Dakota Mock Vervain / Glandularia bipinnatifida	seeds @ 6" oc
	572	Rose Verbena / Glandularia canadensis	seeds @ 6" oc
	573	Rough Blazing Star / Liatris aspera	seeds @ 6" oc
	290	Bergamot / Monarda fistulosa	flat @ 12" oc
	339	Cobaea Beardtongue / Penstemon cobaea	seeds @ 6" oc
	489	Wild Blue Phlox / Phlox divaricata	flat @ 12" oc
	148	Yellow Praire Coneflower / Ratibida columnifera	seeds @ 6" oc
	19	Prairie Violet / Viola pedatifida	seeds @ 6" oc

Table 5.63—Sun Herbaceous Plant Schedule
All herbaceous plants are ornamental. Refer to Figure 5.55—Planting Plan in order to see the locations of each of these plants.

Sunflower Patch Plant Schedule

The number of plants and types of container (such as seeds) that need to be purchased is listed below.

SUNFLOWER_PATCH_PLANT_SCHEDULE

SYMBOL	QTY	COMMON NAME / BOTANICAL NAME	CONT
	113	Virginia Strawberry / Fragaria virginiana	flat @ 6" oc
	3,344	Sunflower / Helianthus annuus	seeds@ 6" oc
	162	Maximilian`s Sunflower / Helianthus maximiliana	seeds@ 6" oc
	52	Willowleaf Sunflower / Helianthus salicifolius	seeds@ 6" oc
	16	Breadroot Scurf-Pea / Psoralea esculenta	flat @ 12" oc

Table 5.64—Sunflower Patch Plant Schedule
The sunflower plant species are ornamental while the Virginia Strawberry and Breadroot Scurf-Pea plants are edible. Refer to Figure 5.55—Planting Plan in order to see the locations of each of these plants.

Seeds of Hope Garden Plant Schedule

The number of plants and types of container (such as seeds) that need to be purchased is listed below.

SEEDS_OF_HOPE_GARDEN_PLANT_SCHEDULE

SYMBOL	QTY	COMMON NAME / BOTANICAL NAME	CONT
	39	Green Onion / Allium wakegi	bulb @ 6" oc
	39	Common Beet / Beta vulgaris	root @ 6" oc
	18	Wild Cabbage / Brassica oleracea	seeds @ 6" oc
	18	Tree Kale / Brassica oleracea acephala	seeds @ 6" oc
	16	Broccoli / Brassica oleracea botrytis	seeds @ 6" oc
	12	Cauliflower / Brassica oleracea botrytis2	seeds @ 6" oc
	46	Field Mustard / Brassica rapa	seeds @ 6" oc
	24	Endive / Cichorium endivia	seeds @ 6" oc
	75	Carrot / Daucus carota	seeds @ 6" oc
	32	Canada Lettuce / Lactuca canadensis	seeds @ 6" oc
	24	Radish / Rhaphanus sativus	seeds @ 6" oc
	12	Spinach / Spinacia oleracea	seeds @ 6" oc

Table 5.65—Seeds of Hope Garden Plant Schedule
All recommended garden plants can be planted and harvested within the school year. Refer to Figure 5.55—Planting Plan in order to see the locations of each of these plants.

Vine Schedule

The number of 1 gallon container vines that need to be purchased is listed below.

VINE_PLANT_SCHEDULE

SYMBOL	QTY	COMMON NAME / BOTANICAL NAME	CONT
	107	Trumpet Creeper / Campsis radicans	1 gal
	116	Bullock's Heart Ivy / Hedera colchica `Dentata Variegata`	1 gal

Table 5.66—Vine Schedule

Trumpet Creeper is a perennial, deciduous vine native to Kansas that prefers full sunlight and is drought tolerant. Bullock's Heart Ivy is a perennial evergreen vine that is both shade and drought tolerant, although it is not native to Kansas. Refer to Figure 5.55—Planting Plan in order to see the locations of each of these plants.

Shrub Descriptions and Climate Requirements

The starred names are the shrubs utilized in the planting plan palette for Garfield.

Soil	Small (2 feet or less)	Medium (2-3 feet)	Large (4 feet or more)
	Full Sun Shrubs		
Dry (Spring)	*Dakota Mock Vervain *Wild Blue Phlox	*Golden Currant *Sand Cherry	*Gro-Low Fragrant Sumac Choke Cherry *Blue Wild Indigo *Rough-leaved Dogwood *Smooth Sumac Winged Sumac
Dry (Summer)		*New Jersey Tea *Sky Blue Aster	*Leadplant *False Indigo
Medium (Spring)			American Hazelnut
Medium (Summer)			*Staghorn Sumac
	Shade Shrubs		
Soil	*Small (2 feet or less)*	*Medium (2-3 feet)*	*Large (4 feet or more)*
Dry (Spring)		*Bottlebrush Sedge Black Raspberry	 Elderberry

Table 5.67—Shrub Plant Descriptions and Climate Requirements

All shrubs recommended for the school are native to Kansas, except for the Green Mound Boxwood—which is an evergreen, drought and shade tolerant shrub; Green Mound Boxwood is not listed in this table. Soil moisture and sunlight requirements as well as bloom period and plant sizes are listed in this table.

Shrub Schedule

The number of shrubs and types of container (such as seeds) that need to be purchased is listed below.

SUN_SHRUBS_PLANT_SCHEDULE

SYMBOL	QTY	COMMON NAME / BOTANICAL NAME	CONT
	21	Leadplant / Amorpha canescens	seeds @ 6" oc
	73	False Indigo / Amorpha fruticosa	1 gal
	44	Sky Blue Aster / Aster oolentangiensis	flat @ 12" oc
	143	Blue Wild Indigo / Baptisia australis	seeds @ 6" oc
	35	Bottlebrush Sedge / Carex comosa	seeds @ 6" oc
	110	New Jersey Tea / Ceanothus americanus	1 gal
	2	Roughleaf Dogwood / Cornus drummondii	5 gal
	38	Dakota Mock Vervain / Glandularia bipinnatifida	seeds @ 6" oc
	92	Wild Blue Phlox / Phlox divaricata	seeds @ 6" oc
	9	Sand Cherry / Prunus pumila	5 gal
	71	Gro-Low Fragrant Sumac / Rhus aromatica `Gro-Low`	3 gal
	3	Smooth Sumac / Rhus glabra	3 gal
	5	Staghorn Sumac / Rhus typhina	3 gal
	26	Golden Currant / Ribes odoratum	1 gal

PART-SHADE_SHRUB_PLANT_SCHEDULE

SYMBOL	QTY	COMMON NAME / BOTANICAL NAME	CONT
	91	Green Mound Boxwood / Buxus x `Green Mound`	5 gal
	4	Elderberry / Sambucus canadensis	5 gal

Table 5.68—Shrub Schedule

All recommended shrubs are ornamental and many attract butterflies and/or avifauna species. Refer to Figure 5.55—Planting Plan in order to see the locations of each of these shrubs.

Tree Descriptions and Climate Requirements

The starred names are the trees utilized in the planting plan palette for Garfield.

Soil	Small (30 feet or less)	Medium (30-40 feet)	Large (50 feet or more)
	Full Sun Trees		
Dry (Spring)	*Mexican Plum-Orchard-woodland American Hophornbeam	*Eastern Red Cedar-evergreen forest *Osage Orange 'White Shield'-Street/Shade Tree	*Honey Locust (any of these: Cottage Green,' 'Majestic,' or 'Maxwell')-Street/Shade Tree
Medium (Spring)	20th Century Crabapple 'Prairie Rose'-Larger Leftover Space Areas *Common Persimmon 'Meader'-Woodland Garden Paw Paw 'Mary Foos Johnson'-Butterfly Garden		
	Partial Sun Trees		
Medium (Spring)	*Serviceberry		
	Shade Trees		
Dry (Spring)	*Eastern Redbud		*Northern Catalpa *Kentucky Coffeetree-male *Shagbark Hickory

Table 5.69—Tree Descriptions and Climate Requirements
All trees recommended for the school are native to Kansas and attract or provide habitat for wildlife.
Soil moisture and sunlight requirements as well as bloom period and plant sizes are listed in this table.