



San Francisco NATURE EXPLORATION AREA Playbook Design Guide

“Because the outdoors provide a range of benefits that we often don’t think about, we need those spaces for us to be our better selves.”

— José González, Founder, Latino Outdoors. ¹

“Nature belongs to us as an essential part of our self and our survival.”

— Dr. Nooshin Razani, pediatrician, founder and director of the Center for Nature and Health, based at UCSF Benioff Children’s Hospital Oakland. ²

This Playbook Design Guide is a handbook for designers to develop this unique landscape genre, nature exploration areas (NEAs), where children can immerse themselves in, create with and enjoy nature. These spaces typically are not about and do not include fixed or formal play elements except when noted in the design documents. Therefore the very prescriptive specifications of ASTM related to manufactured play equipment generally do not apply. CPSI review is not applicable in NEAs except where play elements are specifically called out in the design.

Though each nature exploration area in San Francisco will be unique, a common design language supports communication regarding the importance of NEAs. The design guide is filled with ideas and resources that build on the vision of quality nature-based experiences in the *NEA Playbook* and [San Francisco Children’s Outdoor Bill of Rights](#)³ to enrich spaces for children throughout San Francisco. For a full understanding refer to the NEA Playbook and Bill of Rights while reading this design guide.

In developing this design guide, we studied: best practices from projects around the U.S. and the world; codes and guidelines; and research and advocacy related to fostering healthy and whole development of children and their right to access nature.

This design guide is organized as shown in the table of contents. The last three sections follow feature order in the NEA Playbook.

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Introduction

NEAs can provide places that simultaneously empower well-rounded development of children and encourage a distinct love of place related to the ecological features and processes of that particular locale.

As design professionals it is our duty to understand the following:

1. the applicable codes and regulations;
2. the site's opportunities and constraints;
3. our client's soft and hard costs budget;
4. our client's maintenance abilities; and
5. our end users' needs.

To design to a standard of care, we must consider these key factors for each site. They each significantly influence the final design as well as the quality of the space after construction.

A. DESIGNING WITH CHILDREN IN MIND

When designing an NEA that will be considered successful from the end-user's perspective, the children, it is important to support different developmental needs. It is essential to design for a variety of opportunities for developmental growth and changing interests as each individual evolves over time. For equity and diversity, it is crucial to consider the varying needs of our population, the cultural interests, and the many languages spoken within our San Francisco community.



Studying nature and its many textures and colors.

CHILDHOOD ENVIRONMENTAL QUALITY

Definition: The capacity for an environment to provide opportunities for skill building. *"Skills motivate interaction. Interaction stimulates the learning of skills. Thus, the number and type of skill-related behaviors supported by a given setting is the reasonable measure of its childhood environmental quality."* ⁴

Well-rounded development

Children evolve through various forms of perception and exploration with the environment and others. Each child is born with and cultivates different abilities, learning modalities and interests through play and learning in school, home, and throughout their youth.



"What do you see?"

LEARNING MODALITIES

Definition: In contrast to the idea “that intelligence is best thought of as a single property distributed within the general population along a bell-shaped curve,” Howard Gardner writes: “We now understand that the human mind, reflecting the structure of the human brain, is composed of many separate modules or faculties. Human beings possess a range of capacities and potentials – multiple intelligences – that, both individually and in consort, can be put to many productive uses. Individuals can not only come to understand their multiple intelligences but also deploy them in maximally flexible and productive ways within the human roles that various societies have created.”⁵

Gardner’s eight learning modalities:

1. Musical-rhythmic
2. Visual-spatial
3. Verbal-linguistic
4. Logical-mathematical
5. Bodily-kinesthetic
6. Interpersonal
7. Intrapersonal
8. Naturalistic



This activity allows for a variety of approaches to learning.



A child in control with no prescribed outcome is developing fine and gross motor skills, executive function ability, and their creative skills.

Each individual thrives by following their own cues and interests. Children are simultaneously building on the three intertwined domains of development: (1) physical, (2) cognitive / intellectual, and (3) social / emotional / well-being.

1. Physical development

As the foundation of all other forms of development, the sensory system is made up of six primary senses: tactile, visual, auditory, olfactory (smell), gustatory (taste), proprioceptive (body position and movement) and vestibular (head position and balance). Each sensory system works better when all other senses provide input to their specific sensory systems. In nature we often experience simultaneous, soft input to several senses. For example, while hiking on a chaparral hillside we may experience the smell of the plants, the sight of pollinators flying around us, feel the breeze on our faces and use our proprioceptive and vestibular senses as we scramble up the rocky slope. Children develop gross motor skills from their first attempt at crawling to refined movement in sports, dancing, hiking and tree climbing. Gross motor skills are developed while honing proprioceptive and vestibular senses.

CHILDREN'S PLAY

Definition: *"The essence of children's play:*

1. *Play is initiated and controlled by children.*
2. *Play is a process with no prescribed outcome involving exploration, investigation and manipulation.*
3. *Play is driven solely by "intrinsic motivation".*
4. *Play is necessary for development and is pleasurable to each child."* ⁶

The more opportunities they have to develop these senses as a child the more coordinated they will be as adults. The more opportunities for input to each of the systems the more developed each sense will be.

2. Cognitive / intellectual development

Through play and in learning each child is pushing the boundaries on their cognitive abilities, which are essential for formative development of executive function and language skills. A child develops these essential skills while developing self-control, flexible thinking and working memory. Without executive function, a child may have difficulty focusing, following directions or handling emotions. Additional cognitive and intellectual skills include problem solving, risk assessment, design, construction, organizational skills, planning and sequencing.

In an NEA, when children are constructing dens, they work together, they identify and test the weaker and stronger structural sticks, troubleshoot the order in which to build the den (foundation to roof) and personalize the aesthetic look and feel of the den. Children develop these skills as they delve into their own creativity, develop their own processes, build their own confidence to explore an idea, and find

language to express themselves in a non-linear format. This is the core of imagination, wonder and innovation which is valued throughout our society in many workplaces and communities.



Building confidence through challenge.

3. Social, emotional and well-being

Every being is born as an introvert, an extrovert or somewhere in between. Depending on the activity, their mood, and their energy level, every child wants to belong to a family, peer group, and/or community and desires to lead or follow. From parallel play to role playing, children are developing their social emotional intelligence and an understanding of their own interests, emotional needs and how to realize their physical, social and emotional well-being. Together in an NEA, children develop their own games, negotiate with their peers, and lead with skills in which they excel - from imaginary play to creative constructive play all while being physically active. For example, an NEA offers the opportunity for children to build a community together. This community may

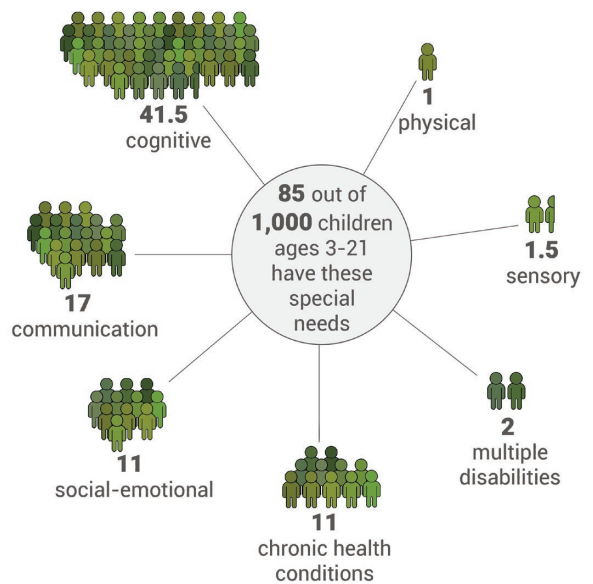
be made of sand, water, soil, natural loose parts and built at a scale that is smaller than the children, with rules created by the children and where each child has a role in this created community. In this form of play, children hone their social skills, their listening skills, and work tactilely and creatively together.

Children experience a state of flow and build self-efficacy, while increasing their ability to listen and understand others. This state of flow that adults sometimes call being in “the zone”, is a mental state of being completely immersed with energized focus in an activity for its own sake - to be fully involved and enjoy the process.

Taking on challenges is part of growing and failing is a necessary part of learning. Self-efficacy develops where one believes in their own abilities to meet challenges and complete tasks. When taking on a new challenge, such as jumping from one log to another, they may fail or they may succeed. While success will build confidence, a failure can build resilience.

STATE OF FLOW

Definition: Mihaly Csikszentmihalyi describes the mental state of flow as “being completely involved in an activity for its own sake. The ego falls away. Time flies. Every action, movement, and thought follows inevitably from the previous one, like playing jazz. Your whole being is involved, and you’re using your skills to the utmost.” ⁷



85 out of 1,000 children have special needs. By focusing on this range NEAs can be designed to be inclusive. ⁸

These three domains: (1) physical, (2) cognitive / intellectual, and (3) social / emotional / well-being are intertwined and develop in each being at different rates per their abilities and interests.

Inclusive design

Many children are born with challenges and/or different perspectives of the world beyond sensory integration, different learning modalities and the many aspects of childhood development. It is essential that designers of children’s spaces think beyond the requirements of the Americans with Disabilities Act (ADA) regulations. The ADA primarily focuses on the needs of people using wheelchairs which is one child out of 1,000 children and the visually impaired which is 1 out of 2,000. The ADA requires an integration of elements within the space but does not require inclusive or universal design. These two terms, inclusive and universal, are often used interchangeably and consider the wide spectrum of human abilities. An inclusive design aims to please a diverse range of individuals and accommodate a variety of experiences and



School in Berlin with large population of children using wheelchairs. These students asked for challenge and universal design including places with sand.

Social equity ¹⁰ and diversity

A key goal of the SF Children & Nature Collaborative is to attempt to equalize access to quality nature-based experiences for all residents of San Francisco, especially underserved communities. Today and in the past, many people, particularly people struggling for social equity, have not had access to nature. Ideally all San Francisco residents have access to nature within walking distance of their house for their health and well-being.

“Nature is a powerful healer... What I love about nature is that it’s the ultimate equalizer: The trees don’t know what color you are; The birds don’t know how much money you have in your bank account. It’s a way for us to shed the -isms that weigh on us throughout our work days, throughout our week, and give us that respite and that opportunity to actually connect with other people. Nature provides a sense of place and belonging.”

– Rue Mapp, Founder Outdoor Afro ¹¹



NEAs can be designed for equity and all age groups.

ways of interacting with the world. In addition to supporting visually impaired children and children using wheelchairs, inclusive design also supports the 83.5 children out of 1,000 with other special needs, as well as all children’s cognitive and sensory needs. If we focus on the needs of all children with inclusive design, we can develop designs that thoughtfully provide each child with opportunities to hone their skills and interests where they will be able to have experiences that are integrated throughout the space. By doing this all children are more likely to succeed and have the opportunity to lead in the areas where they excel.

“It is a way of thinking and a way of working to produce attractive, functional environments that can be enjoyed equally by everyone; taking into account differences in age, gender, culture and ability.” The six principles: (1) diversity and difference; (2) ease of use; (3) freedom of choice and access to mainstream activities; (4) quality; (5) legibility and predictability; and (6) safety.

– Play England, *Inclusive Design for Play*. ⁹

Environments for well-rounded development and inclusive design

Children crave malleable, non-static and child-owned experiences. Children need an environment which can keep pace with their development and growth. Children need an environment where everyone belongs and can interact. They need a variety of experiences, from jumping (proprioceptive system / body awareness) to touching (tactile system), for sensory integration of the interactive central nervous system. The way they use an environment changes as they grow older and become more skillful. ¹² These experiences help them test their physical, cognitive, and social skills in ways that engage them in the moment.

In addition to an environment that allows for change, children thrive when they feel a sense of ownership of the space, as Kevin Lynch states, *“have spatial rights such as the right of presence, of being in a place; of use and action; of appropriation; of modification”*. ¹³ Most landscapes and aspects of children’s lives are controlled by adults. When children are provided with opportunities where they can be “in charge” of their space they benefit emotionally, socially and cognitively.



Habitats create inspiring opportunities for observing wildlife in the city.

“Nature is the great equalizer. It’s a human right. As opposed to thinking about it as an extra luxury to maximizing health, I think about it as a baseline minimum to have proper childhood development.”

– Dr. Nooshin Razani ¹⁴



Student garden journals documenting the soil they tend.

B. URBAN ECOLOGY, SIGNIFICANCE OF PLACE

Prior to the late 1800s children had access to wild nature in all its forms throughout San Francisco. However, for more than 100 years, street grids, building development, culverted creeks, filled in tidal marshes, and other forms of development have pushed natural processes and nature further from children’s daily lives in San Francisco.

1. Sense of place in modern culture

Natural landscapes are powerful in helping shape children’s emerging sense of identity. David Orr describes, “a place – where you are and where you come from – is intertwined with knowledge of who you are.”¹⁵ However, in our nomadic culture in the US we move an average of ten times in a lifetime and most of us are displaced people because we no longer source our food and water from our immediate surroundings.¹⁶ If David Orr’s statement – place is a part of us – is correct, what does place mean to us in today’s urban society?

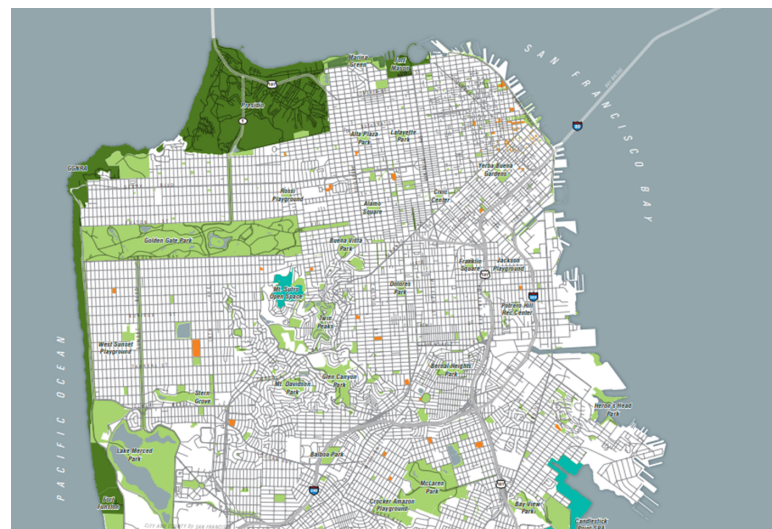
2. Place attachment and affiliation

According to Louise Chawla, we start to assimilate our place as children. A sense of place is a strong source of our identity. In her work, she understands that childhood places can provide security, social affiliation, a venue for creative expression and exploration, and reinforce our general cultural nostalgia for a safer, more stable world.¹⁷ Children seek these spaces out and school-age children are the heaviest users of outdoor landscapes.¹⁸ Her studies indicate that memories of natural landscapes and private landscapes act as salient childhood memories in adults and are most frequently cited as favorite childhood places.¹⁹ Landscape Architect Robin Moore also believes that landscapes are powerful in helping shape children’s emerging

sense of identity and suggests that children develop place “affiliations” and meanings accrue through “experiential layering”.²⁰ These two researchers imply that children need more access rather than less to nature.



- Sand dune
- Grassland
- Coastal scrub
- Freshwater creek
- Saltwater marsh
- Ohlone village
- Ohlone seasonal camp / artifacts
- Native habitat semi-protected
- Native habitat unprotected
- Topography 10' contours



- EXISTING OPEN SPACE**
- SFRPD land : 3,433 acres
 - State-owned land : 255 acres
 - Federal-owned land : 100 acres
 - Other : 560 acres

Above: San Francisco’s ecological systems before the Mission and Presidio developments.
Below: San Francisco open spaces / areas of urban wild in 2019.

3. We instinctively seek out nature

These points argue that we soak up our place through experience and that children crave natural spaces, have an affinity for the natural world, and thrive when given full access to it. As we develop in childhood, do we attach memories to the quality of daylight, the textures of native rocks and soils, the sound of local birds, our regional seasons, and the smells of local plant habitats? Do these elements become an innate part of who we are? The biophilia hypothesis suggests that humans possess an innate tendency to seek connections with nature. If that is the case, giving all children opportunities to interact with nature, such as places to observe wildlife, play with natural elements and just be in nature, helps them develop a stronger identity. If children can seek out their unique local landscapes at least three times per week ²¹, these landscapes can provide a variety of sensory experiences and act as a place for restoration no matter the size. In planning terms, a ¼ mile, or 15-minute walk is typically considered the standard accessible range for adults. While free-range children who are older may be able to access landscapes within the ¼ mile range, younger children have smaller ranges, so it is best to provide opportunities closer to home to allow more frequent exposure.



Habitat Restoration activity at Heron's Head Park.

FREE-RANGE

Definitions:

- a. *A free-range kid is a kid who gets treated as a smart, young, capable individual, not an invalid who needs constant attention and help...Our kids deserve a chance to stretch and grow and do what we did - stay out til the street lights come on.* ²²
- b. *Free-range parenting is the concept of raising children in the spirit of encouraging them to function independently and with limited parental supervision, in accordance of their age of development and with a reasonable acceptance of realistic personal risks.* ²³

BIOPHILIA

Definition: Biophilia describes the connections that human beings subconsciously seek with the rest of life. Derived from the Latin *bio* (life) and *philia* (attraction – the opposite of phobia, or fear), *biophilia* means the love of life or living systems. ²⁴

4. Nature is restorative

Places with nature, can offer mental restoration which particularly benefits the 40% of children born with unique sensory needs. Nature provides restorative experiences by: offering spaces for 'soft' fascination experiences which offer opportunity for reflection; freeing one from mental activity which requires directed attention; being rich enough and coherent enough to constitute a whole other world"; and providing compatibility between the environment and one's purposes and inclinations, from sand castle building to kite flying. ²⁵

“Nature helps overcome directed-attention fatigue. It’s a neurological phenomenon: Essentially, all the stimuli in our modern environments exhaust our ability to pay attention because we’re doing a lot of things — responding to emails or attending meetings — that may not be intuitively fascinating to us. You don’t need to go out into nature with a plan to learn something or stick to a schedule to reap the benefits. Just being out there is filling the reservoir back up.”

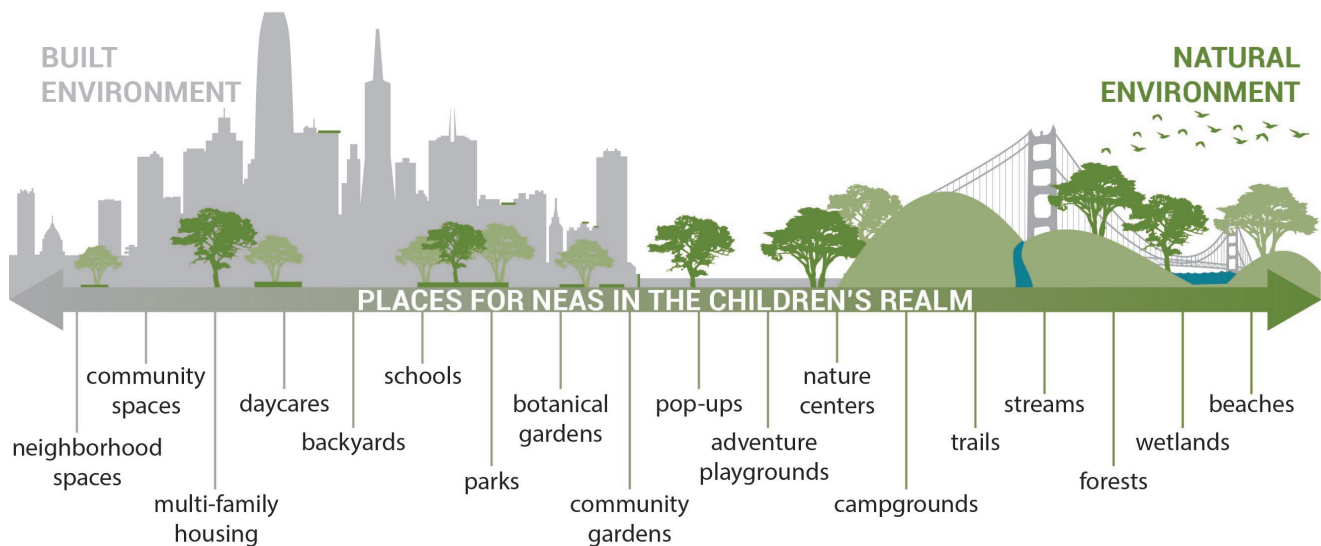
– José González, Founder, Latino Outdoors ²⁶

San Francisco is a distinct city full of remnant ecological processes, microclimates, habitats, and diverse features ranging from the Pacific Ocean to rolling hills to tidal wetlands. It is a city with rich biodiversity throughout a complex mosaic of parklands, natural areas, urban forest, and neighborhoods. However, many of these experiences are no longer as accessible to children in their everyday lives. If children can have access to real natural experiences with NEAs on a regular basis they can fall in love with their local nature while simultaneously developing their physical, cognitive, and social skills.

C. NATURE EXPLORATION AREAS

The majority of children’s public outdoor spaces range from school grounds to playgrounds as shown in the illustration below. This illustration shows a nature continuum where the environment stretches from completely human-made construction (devoid of living elements) to an untouched natural environment. Most of the experiences in San Francisco fall somewhere between these two extremes.

Historically children who had the opportunity to play roamed in unmanicured landscapes such as streets, backyards, vacant lots and nearby canyons, forests, wetlands, and farms on a daily basis. ^{27, 28} These unofficial spaces provided opportunities for children to manipulate the environment, learning about the world from unstructured experimentation and exploration. Today, in San Francisco and throughout the USA, the opportunities to play in these types of spaces with peers and caregivers has been significantly diminished by children’s structured lives, urban development/density, traffic ^{29, 30} and from the absence of “eyes on the street.” ³¹



San Francisco’s nature continuum from human-made to the natural environment shows children can play anywhere. ³²

Play in NEAs can be solitary, with peers of the same age or multi-ages and with caregivers. The central idea behind nature play is that natural settings for children’s play that previous generations took for granted can be deliberately created through the resourceful and innovative treatment of an outdoor site. NEA areas can provide children with daily and weekly access to these opportunities again by placing these NEAs in school grounds and daycares or within parks and other public landscapes that are within a safe walk (typically a quarter mile walking distance / 15-minute walk) of children’s residences and/or their schools.



In open-ended play there are no rules and no expectations.

OPEN-ENDED PLAY

Definitions:

1. *"Open-endedness is the provision for freedom from limitations, independent thinking, creativity, and living/working/playing outside of preset expectations."* ³³
2. *"There are no rules to follow, no expectations, no specific problems to solve, and no pressure to produce a finished product when engaging freely in open-ended play."* ³⁴



Nature play is by design about open-endedness.

Beyond health and wellness, there are well-documented cognitive and social benefits to nature-based experiences. When in natural settings, the opportunities for development are four-fold. Firstly, natural settings provide children with a range of learning options that can be explored singularly or in tandem. These play experiences include imaginative play, multisensory experiences, physical challenges, fine motor skill enhancement and creative constructive play. Secondly, natural settings don’t tell children how to play or explore. Natural features and terrain provide a rich array of colors, shapes, textures, and forms that provide an open-ended invitation to play and explore - as contrasted with traditional playground equipment such as a metal and plastic pirate ship or castle. Thirdly, natural areas are not static, but change with the seasons and the weather, and generally are made up of malleable materials. ³⁵ And lastly, natural areas allow children to develop their independence even if an adult is nearby. This gives children room for their own thoughts, room to experiment, and room to grow. ³⁶

“A Nature Exploration Area (NEA) is an area managed primarily for the purpose of encouraging people of all ages to engage with diverse natural elements including loose materials, fixed features such as large rocks and tree trunks, organisms, and each other.”

– NEA Playbook, p. 5

A natural exploration area is defined as “a designed, managed location in an existing or modified outdoor environment where children of all ages and abilities play and learn by engaging with and manipulating diverse natural elements, materials, organisms, and habitats, through sensory, fine motor, and gross motor experiences”

– Nature Play and Learning Places.³⁷



Loose natural materials invite exploration and creativity.



NEAs provide opportunities to fall in love with nature.

The NEA Playbook and this design guide are intended to advise the development of a wide array of NEAs: small and large, pop-up or permanent, and situated in existing natural areas or in built environments. The design guide is written with the hope that each site design can: look to the essence of the space and accentuate those intrinsic natural features and ecological processes; to provide children with access to their own real nature in their locale; and to support the developmental needs and interests of children and their community.

This type of public landscape is a relatively new genre for clients, maintenance staff, and caregivers. For this reason, we recommend starting with basic ideas that build upon the existing resources and abilities of the landowners while listening to the ideas from the community. Some stakeholders may need to experience the “shallow end” aspects of these ideas and learn and get comfortable with them before diving into the “deep end” ideas. As a society we need to see how our children will use and benefit from these spaces, train our staff, and inform our caregivers.

All places should be developed to the applicable codes including ADA. Interpretation of access requirements is the responsibility of access coordinators of varied jurisdictions.

The Features in the NEA Playbook are each described with the following sections:

- What are they and why include them?
- Best Practices
- Resources

This guidebook builds on those sections, particularly the best practices, by providing guide points (ideas you may choose to use in your project), precedent images, and specific resources for professional designers. Refer to the NEA Playbook for additional information on each feature.

1 | Loose natural elements

What are they?
Loose natural elements are sticks, rocks, leaves, pine cones, bark, sand, mud, and cut sections of tree branches or logs.

Why include them?
"Loose parts" provide for stimulating changes in the landscape and open-ended opportunities that foster creativity, critical thinking, sensory input, action, collaboration and exploration. They invite fine motor play, constructive play, imaginative play, and social play. While creating a tangible connection with nature these mobile elements empower children to shape and re-shape their play space, something rarely possible in adult-dominated environments of the city.

Best practices

- Provide an adequate dedicated area that allows for a sufficient variety and quantity of loose natural materials (at least three different kinds)
- Try to source material that relates to surrounding area, e.g. fallen leaves, pine cones, branches and bark can come from trees and plants in or near an NEA site
- Refresh materials regularly to keep NEA well-stocked since they naturally decompose or move
- Large elements such as loose stumps should be at least twice as wide as they are tall for increased stability

Resources
Find loose natural elements design ideas in our Design Guide

Nature Exploration Area Design Playbook

Example page from the Nature Exploration Area Design Playbook

Loose parts add many valuable play affordances to an NEA. Loose parts provide for stimulating changes in the landscape and open-ended opportunities that foster creativity, critical thinking, sensory input, action, collaboration, and exploration. Before developing the site design, the professional will benefit from understanding the types, scales and needs for loose natural elements (LNE) to support the daily use of LNE in the space. By understanding the needs, the designer can develop a space and dedicated built elements to support the various forms of loose part play and learning to enrich play and learning and assist management of the space.

F1. GUIDE POINTS

1. Area for using LNE
Provide some adequate area that is distinctly set aside and usable for using loose natural elements. This will ensure that LNE can be provided as one of the six essential elements and anticipated activities for the LNE supported in the NEA. This area will function best if it is located away from running, swinging or other fast-moving activities. This area may have dedicated space for large LNE activities such as den building or smaller LNE activities such as fairy houses, weaving or painting. The area may also include raised surfaces for fine motor skills work and inclusive design.

Loose parts can foster imaginary and creative constructive play.

2. Storage
Include storage for LNE has pros and cons, depending on multiple factors, as listed below. In some situations, storage is a necessity, in others it is unneeded, and can impede the purpose of the NEA. When storage for an NEA is developed we recommend the following criteria:

- Public access and/or staff access
- Type/size of storage elements being stored
- Organization for different categories of elements being stored
- Adjacency to "work space"
- Movable storage or fixed storage
- Locked or always open
- Weather protection or open to the natural elements

AFFORDANCE
Definition: "An affordance is something in the environment that makes an offer to a person, or reveals a possible function...Affordances are often specific to particular groups...Affordances are also often sensitive to small physical changes."¹⁷
For example tree with low limbs may provide many play affordances which could include climbing, an imaginary enclosure, or leaves for loose parts play.

NEA Playbook Design Guide

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San Francisco Children & Nature

Example page from the NEA Playbook Design Guide

Structure of guidebook for features

Necessary features

This section includes the six site elements that are essential for a viable nature exploration space. All NEA spaces should include each of the following features in their spaces:



F1
Loose
natural
elements



F4
Sensory &
immersive
experiences



F2
Beneficial
risk elements



F5
Site
boundaries



F3
Ecological
elements



F6
Welcoming
signage



Feature 1 | Loose Natural Elements

Loose parts add many valuable play affordances to an NEA. Loose parts provide for stimulating changes in the landscape and open-ended opportunities that foster creativity, critical thinking, sensory input, action, collaboration, and exploration. Before developing the site design, the professional will benefit from understanding the types, scales and needs for loose natural elements (LNE) to support the daily use of LNE in the space. By understanding the needs, the designer can develop a space and dedicated built elements to support the various forms of loose part play and learning to enrich play and learning and assist management of the space.

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Loose natural parts invite imaginative and creative play.

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3. Quantity

Provide a minimum quantity of LNE to inspire rich play but is not so much that the NEA space becomes chaotic and filled with too many LNE. In our experience this minimal amount is at least 1/2 gallon per 10 square feet of area for LNE.

4. Variety

Include a variety of LNE to foster rich, creative, constructive and imaginary play. The variety at the NEA can be everchanging materials that are seasonal, harvested from the site or nearby landowner parcel, and provide a synergistic form of play between the types of LNE. In our experience *at least three available distinct types of materials* for use, excluding any material used as ground cover, will provide for a rich play experience. Manufactured loose elements may also be present, but we recommend that they comprise less than 10% of the total loose elements to reinforce the connection to nature.



All children benefit from a variety of LNE in an NEA.

5. Types

- a. LNE may include: sticks, rocks, leaves, pine cones, bark, sand, mud, cut sections of tree branches and logs or other natural materials.
- b. Elements may vary in size from very small elements such as a grain of sand to very large natural materials such as a tree round, stump, or long branch. We recommend that larger elements that children may climb onto be at least twice as wide as they are tall to make objects difficult to tip.
- c. To integrate and be harmonious with the setting and reinforce local ecological literacy we recommend that the LNE be similar to or from surrounding natural features such as fallen leaves or pinecones from nearby trees.

ECOLOGICAL LITERACY

Definition: *“An environmentally literate person has the capacity to act individually and with others to support ecologically sound, economically prosperous, and equitable communities for present and future generations. Through lived experiences and education programs that include classroom-based lessons, experiential education, and outdoor learning, students will become environmentally literate, developing the knowledge, skills, and understanding of environmental principles to analyze environmental issues and make informed decisions.”* ³⁹

6. Import and maintenance

To maintain a rich LNE play experience materials will need to be regularly imported and stocked. It is recommended that a maintenance champion (who will be responsible for materials maintenance and replenishment) be identified early on in the design process, and included in decision making around all aspects of LNE design.



Children building a den with large loose parts.

F1. REFERENCES

Daly, Lisa and Beloglovsky, Miriam; Loose Parts: Inspiring Play in Young Children.

Danks, Sharon Gamson; Asphalt to Ecosystems, pp. 227-228.

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Learning through Landscapes | [Loose Parts Play Toolkit](#)

Learning through Landscapes | This place is like a building site - Loose Parts Play

Alliance for Childhood | Loose Parts Play Pods and Adventure Play

Playground Ideas | [Loose Parts Manual](#)

Nature Play Queensland | Loose Parks Play Wishlist



Feature 2 | Beneficial Risk Elements

Children inherently seek graduated challenges. It is part of evolving and developing as a living being. According to developmental child psychologist, Dr. Mariana Brussoni, risky play is associated with increased physical activity in children and the development of social behaviors, self-esteem, and risk management skills.⁴⁰ Bernard Speigal of PLAYLINK in the UK says that each time we try something new there is a moment of risk. In order for us to cultivate our senses, particularly our proprioceptive and vestibular senses, we need to take risks. These risks develop growth mindsets and resiliency.

As defined in the sidebar, there are differences between a challenge, a hazard and an experience of beneficial risk. This section focuses on beneficial risks which come in many forms from mental to physical challenges. As a society we laud businesses who succeed when taking a beneficial risk. Rather than minimizing beneficial risks for our children, as is often the case, we should provide opportunities for experiencing appropriate levels of risk and benefiting from it.

Professor Ellen Beate Hansen Sandseter has focused her research on risky play, well-being and outdoor education in early childhood. She identifies several types of risky activities children naturally seek, including: play with great heights; play with high speed; play with tools; and play near elements.⁴¹ Her research goes on to look at how children estimate their own abilities and judgements of risky situations and how this has progressed throughout evolution and advances with each child as they develop.

BENEFICIAL RISK COMMON LANGUAGE

Beneficial Risk

1. *"Managing risks in public spaces is a value-based activity. It requires the risk of harm from an activity to be weighed up against the benefits..."*⁴²
2. *"Risk-benefit analysis means that the provider weighs, with equal consideration, the duty to protect children from avoidable serious harm and the duty to provide them with stimulating adventurous play opportunities."*⁴³
3. *"Settings that provide activities with a broad range of challenges and graduated levels of safe risk-taking to children of different ages and abilities."*⁴⁴

Challenge

1. *"A challenge is something a child can see and chooses to undertake or not. Of great importance, children need to take risks to challenge their skills and courage. A risk-free play area is neither possible nor desirable."*⁴⁵
2. *Graduated level of challenges: "In multi-age settings provide activities with a broad range of challenges and graduated levels of safe risk-taking to children of different ages and abilities."*⁴⁶

Childhood Resiliency

1. *"is having strength to deal with challenges"*⁴⁷
2. *"develops four characteristics: social competence, problem solving skills, autonomy, sense of purpose and future"*⁴⁸

BENEFICIAL RISK COMMON LANGUAGE (Cont.)

Hazard

1. "Hazard refers to any potential source of harm and is often used to describe a situation that is unacceptable and requires mitigation."⁴⁹
2. A hazard is a danger that a child cannot perceive and should not need to assess such as the structural integrity of a play element, bolts on equipment that could be protrusions, or entanglement potential in elements. In children's landscapes, hazards are identified and managed by CPSIs, park managers, play equipment designers and other professionals. (Source: Bay Tree Design)

Risk

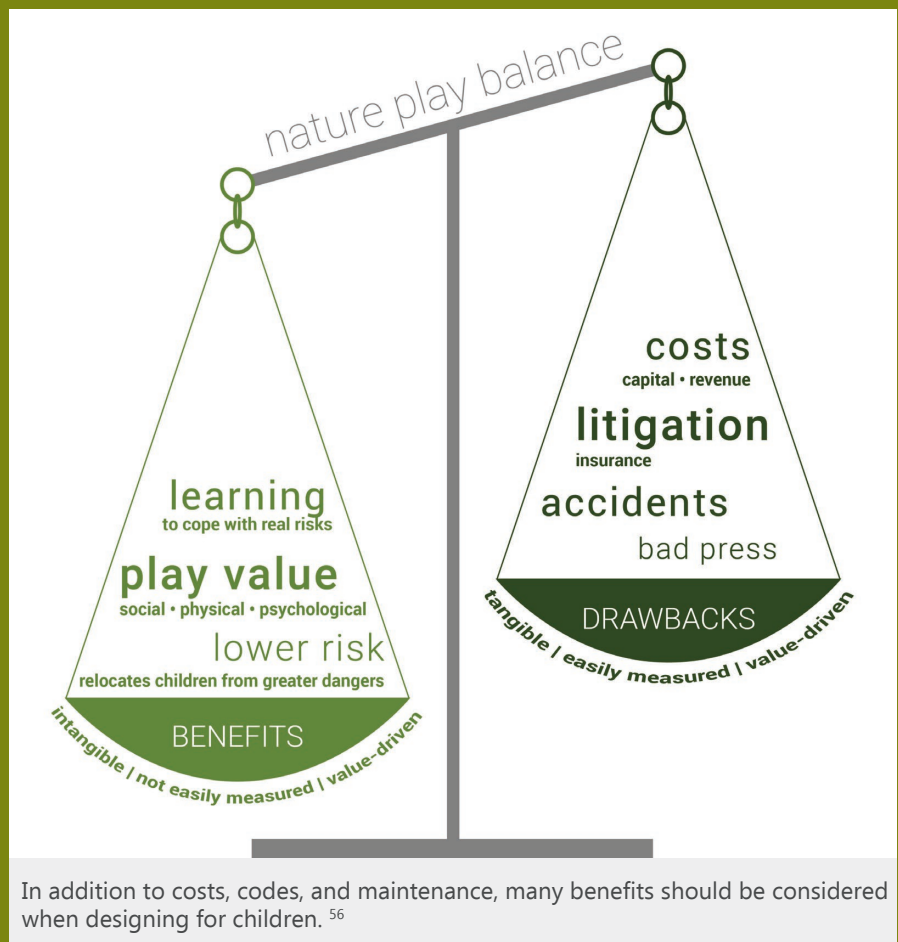
1. "Risk is defined as the combination of the probability of occurrence of harm and the severity of that harm."⁵⁰
2. "Risk is present in virtually every situation both in nature and in life, and part of growing up is learning how to navigate risk."⁵¹
3. "Involves a "situation whereby a child can recognize and evaluate a challenge and decide on a course of action."⁵²

Risk-benefit assessment (adults)

Providers can make sound judgements about many of the risks and benefits relating to play provision but that they need to record their considerations and evidence base systematically.⁵³

Risk compensation

1. "Risk compensation occurs when a person responds to a safety measure by taking a greater risk."⁵⁴
2. Standardization is dangerous because play becomes simplified and the child does not have to worry about [their] movements.⁵⁵



As children test themselves accidents will happen, but as they begin to understand their abilities and take graduated challenges their accidents will significantly decrease in severity.

According to Dr. Mariana Brussoni, we cannot eliminate all accidents, but we can develop spaces that allow for beneficial risk and are developed to be as safe as necessary rather than as safe as possible. She writes, “children have a natural propensity towards risky play; and keeping children safe involves letting them take and manage risks. Safety efforts should be balanced with opportunities for child development through outdoor risky play. Make play as safe as necessary rather than as safe as possible to balance priorities for optimal child development.”⁵⁷



Balancing with a friend can be challenging and rewarding.

Other countries around the globe embrace the idea of providing children with affordances that allow children to take beneficial risk challenges in their daily lives. They see it as a responsibility to provide these developmental opportunities to their children and youth. The City of Berlin intentionally designs “dangerous playgrounds”. All citizens of Berlin are under the same medical insurance policy. The insurers determined that it was less expensive and a better health policy to teach children how to balance and climb and enhance their proprioceptive and vestibular senses than it was to take care of clumsy adults who did not develop these senses as children.⁵⁸ In their twenty-plus years of following this policy the school district in Berlin has moved from infrequent but large injuries such as a broken arm in the playground to more frequent but very minor injuries such as bumps or bruises.

The non-profit International School Grounds Alliance developed the *Declaration for Risk in Play and Learning*, the result of a three-year collaboration between fourteen education and design professionals from seven countries and four continents who shared their professional knowledge and research. Through this process the group developed the Declaration, a list of resources and seven global understandings of beneficial risks:

1. Standard playgrounds = bigger accidents
2. Wonder and curiosity often include risk
3. All children, regardless of abilities, need appropriate challenges
4. Adults create the tone of children’s spaces
5. Risk is key to learning opportunities
6. No risk = no challenge
7. A risk-free playground does not exist⁵⁹

F2. GUIDE POINTS

As designers it is our responsibility to design for the appropriate level of beneficial risk for all children. Children’s abilities and needs vary based on individual temperament, experience, birth challenges, and opportunities. A particular NEA will be most successful if developed with a particular user-group in mind as well as understanding of supervision quality (on-site staff and/or parents and caregivers), hours and ability to close the site, and the maintenance plan for the space. Risks must not be confused with hidden hazards, as children can only assess risks which they can perceive.

The recommendations below are organized by how they relate to the activities described by Professor Sandseter. Identifying what types of beneficial risks are desirable and providing for those may include the following guide points:

1. Code and beneficial risk

Guiding the design of beneficial risk elements, including the materials used, size, shape, and the surrounding ground surface, should be the policies of the space owner and/or manager, applicable codes, and risk-benefit analyses such as the example in the F2 references by Play England.



Youth learn to navigate fire with special tools.



Children build self-efficacy from taking beneficial risks.

2. Connection to nature

- a. Design to the primary purpose of an NEA which is to provide children with a connection to nature. The overall feel and aesthetic of the site should retain a natural character. An element may be altered but must retain the core of its natural quality. For example, a log designed to accommodate sitting is better than a wood bench.
- b. Stand-alone manufactured elements that support beneficial risk activities may be sparsely used throughout the space. Select manufactured elements, when needed, that support activities that cannot be accommodated by natural materials, provide opportunities for high quality play, accessibility, and when possible are made from natural materials such as Robinia wood or natural colored rope.

3. Dedicated space for beneficial risk

The NEA should be designed to accommodate beneficial risk activities as defined below. Dedicated elements and space should be included to ensure quality beneficial risk opportunities.

4. Heights

Provide opportunities for experiencing graduated levels of heights with built elements (integrating accessibility), "sideways trees", stumps, boulders, a change of topography (integrating accessibility) or planting trees that can support climbing when trees are mature such as *Aesculus californica*, *Leptospermum laevigatum*, and *Quercus agrifolia*. These elements support balancing high and low, jumping, and climbing. All activities where one can explore heights.



A hammer can be a beneficial risk element.



Learning to play safely around water.

5. Speed

Incorporate space and/or elements that support running, jumping, sliding, moving fast in a wheelchair, or other self-initiated high-speed experiences into the NEA. For these elements it is important that they are not sited to conflict with other activities and be designed to be as safe as necessary.

6. Tools

Provide a dedicated place to use tools, such as carving knives or wood working tools, and dedicated locked storage for the tools when not in use. Work with the landowner / client to understand their safety protocols so that the design provides elements and space as needed to support the protocols.

7. Fire and water

- a. Design a dedicated space with ample room and clear boundaries for a fire circle if it is included in the space.
- b. Design water features on a site to provide for direct experience and teaching opportunities. Water can be provided as a water pump in a sand area, a raised trough, a pond with an edge designed for awareness, or a "dry creek" where stormwater is visible during the rain.



Variance of heights encourage developmentally appropriate risks (photo from Berlin).

F2. REFERENCES

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Feature 3 | Ecological Elements



One of the key points in the San Francisco Children’s Outdoor Bill of Rights is to discover urban wildlife. With the NEA sites, we have the opportunity to provide daily access to quintessential San Francisco nature throughout the city. Each of these NEA places can provide different experiences by tapping into the deeper ecological character and using the thoughtful design to reinforce what is happening at that particular site.

These experiences could include wildlife and habitat values informed by San Francisco’s dunes, woodlands, ephemeral creeks, wetlands, beaches, hills, fog, and chaparral plant communities from small marginal sites to parts of parks and schoolyards. Designing for spaces that foster healthy ecological processes and provide for the local biodiversity of the project area, whether large or small, will give the site ever changing richness that is place-based with ecological literacy learning opportunities. Ecological elements that may be included are geological features, sustainable and habitat-friendly landscaping, seasonal and permanent water elements, habitat structures and visible water and energy conservation features. These ecological elements will provide a unique and more natural experience for the public throughout the urban realm of San Francisco.



Ecological features can simultaneously offer habitat value and unique play experiences.

“All urban open spaces should be compatible with or support habitat, natural systems, and cultural history.”

– SF Planning Urban Design Guidelines (2017)

ECOLOGICAL ELEMENTS EXAMPLES

Animal:

- Insect home
- Pollinator garden
- Wildlife viewing blind
- Bird house

Air:

- Windssocks
- Weather station
- Wind turbine

Earth:

- Boulders
- Sand
- Soil

Plants and seeds:

- Native plants (with play and learning affordances)
- Tree rounds and logs
- Sticks
- Leaves to play with
- Pinecones

Water:

- Cistern with truth tube
- Creek
- Dry creek
- Fog catcher
- Marsh
- Pond

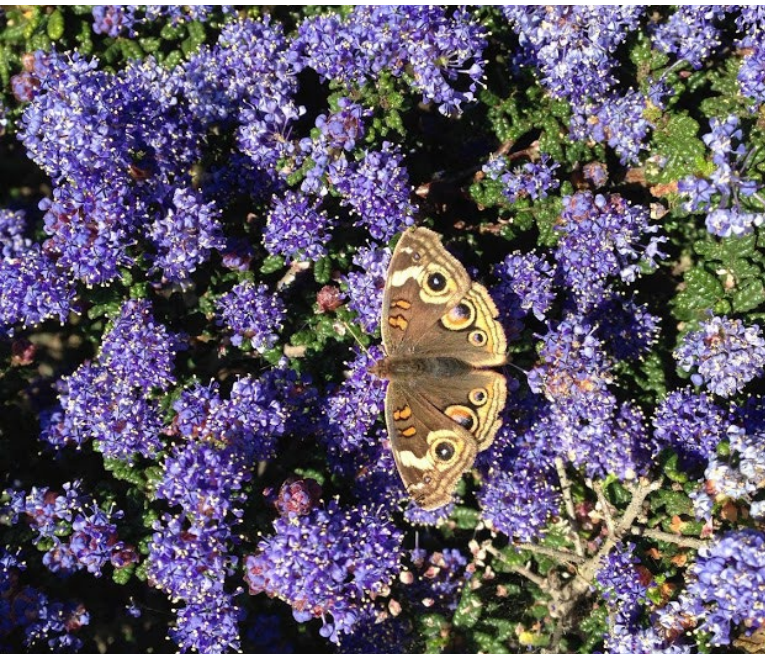
F3. GUIDE POINTS

1. Landscape typologies

Draw from and embrace the San Francisco landscape typologies of your site, from geology to flora. This may come from processes, features, and materials that reinforce the understanding of the distinct San Francisco landscape of your NEA site. For example, if your site is in the Inner Mission and you can capture stormwater which can be connected to a small “dry creek” you could demonstrate what Mission Creek looked like in this neighborhood prior to development. The “dry creek” could have riparian plants, cobbles, and other natural features.

2. Plant palette

Develop a plant palette with ecological values in mind: native plants that are appropriate to the site’s microclimate as well as non-native plants that provide pollinator and bird-habitat can provide wildlife and habitat values to the NEA.



Native plants attract native wildlife such as this Ceanothus with the Buckeye butterfly.



Children need to touch and experience nature to understand it.

3. Landscape assets

Develop the site in situ for children to fall in love with this part of the San Francisco landscape through touch, smell, sight, sound, and interaction. Prior to designing the site look for any existing features such as rock outcroppings (that are not serpentine), waterways, views, and trees that you can retain, celebrate, and integrate into the site design. If the site is in the Lakeshore area, build on the synergy of wildlife that visit Lake Merced. How can your site attract some of those birds? If your site is in Hunter’s Point, how can you capture the feeling of visiting the wetlands from predevelopment?

4. Ecological literacy

Provide experiences with innate opportunities for ecological literacy in your designs. Develop sites and features that allow for onsite learning via field trips from local schools or through play.

5. Natural process

Reinforce the natural processes of the site visually and/or experientially such as the storm drainage,

capturing the fog and playing with the wind. In the Outer Sunset a garden with windsocks, a weather station, or a wind shelter for LNE space could demonstrate how wind directions and speed changes there seasonally, daily, and hourly. If the site is in Pacific Heights providing places that encourage lying down and watching the fog or clouds move through the Golden Gate will show how air moves at different speeds, at different heights, and different temperatures.

6. Freshwater features

Include freshwater features that enhance wildlife values and habitat values from butterfly drinking spots to small ponds and including water features that support rich play experiences. These may be the same or separate depending on the wildlife values and the size of the feature.

7. Child interaction

Work with the landowner or tenant by following the classification system for child interaction:

- a. edible / harvested to eat
- b. loose part / harvested for play
- c. touchable / interactive – children’s sensory experience is primary factor
- d. experiential – place to be in while showing respect for nature
- e. viewable – a non-accessible area of the site that conserves and/or promotes wildlife habitat and local biodiversity.

8. Green infrastructure

Employ environmental technologies and visible (and interactable) green infrastructure best practices to respond to the site, its surroundings, and local and regional systems such as fog catchers, stormwater infrastructure connected to play, or a piece of art that captures the processes of the area.



1. San Antonio Botanical Garden play area representing ecology of region.
2. Restored wetland in schoolyard in Colorado.
3. Weaving loom with seasonal plant loose parts.



F3. REFERENCES

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- <https://www.wood-biological.com/san-francisco-plant-checklist/>
- SFPUC Plant selection <http://sfplantfinder.org/index.html>
- SFPUC Stormwater Plants <https://www.sfwater.org/Modules/ShowDocument.aspx?documentID=2775>
- Found SF - <http://www.foundsf.org>



Feature 4 | Sensory & Immersive Experiences

Sensory experiences invite touching, smelling and tasting. Immersive experiences invite a feeling of being completely in a space, typically an opportunity to be surrounded by features such as plants, boulders, logs, topography, or child-made elements. These experiences can be very different but when they are combined, they provide a more intimate experience of nature in an NEA, especially in limited spaces.

As described in the introduction, sensory experiences provide children with opportunities to take information in, organize it and respond to it. This is called sensory integration and is essential for well-rounded development. In addition to vestibular and proprioceptive experiences described in beneficial risk, children need olfactory, visual, auditory, gustatory, and tactile experiences.

The level and variety of sensory experiences are dependent on the design of the site and proposed materials. These can include existing features and processes that can be enhanced; experiences with sand, mud and water (identified in the SF Children’s Outdoor Bill of Rights); planting choices; and access to other elements.

Immersive experiences for children are developed with the scale of plants, creating places that can feel “far away” by visually and textually allowing children to escape the urban environment and adult world. These immersive experiences can be rich and coherent spaces that create another “world”.

Children can attain a “state of flow” where they are fully immersed in an activity with sole focus and lose track of time in enriched environments. These experiences are beneficial to children’s well-being and were a part of many children’s lives when life was less structured and children could easily access outside spaces that were not maintained and designed by adults.



Consider plants that offer many play affordances and sensory experiences.

F4. GUIDE POINTS

1. Plant palette

Develop a non-poisonous and non-invasive plant palette that provides opportunities for:

- a. picking for either loose parts play and/or nibbling,
- b. smelling with a variety of aromas (some that are not overwhelming),
- c. touching a diversity of textures,
- d. visually capturing the movement of the wind,
- e. exemplifying the San Francisco seasonal changes, and
- f. providing scale through size and shapes of leaves as well as plant structure.

2. Plant massing

Create a plant layout that offers opportunities for:

- a. immersing oneself in a plant community, and
- b. immersing oneself into a “hidden” place.

3. Logs and boulders

Strategically place logs and/or boulders, when incorporating them, to offer full body experiences for “hiding” and touching. Boulders may be placed in groups.

4. Sand and water

Add potable water, if the site includes native sand or the site design includes a sand area, to the NEA to increase opportunities for sensory experiences and creative constructive play.

5. “Enclosed” experiences

Design for immersive experiences with enclosed dens, shrubs, change in topography, narrow trails with bends and other child-scaled environments. Designing for this activity can be done without creating full hiding spaces.

6. Topography

Manipulate the topography, if the site includes a change in grade, to carve different spaces that are high for vantage points and low to be immersive.

7. Plant

Include planter boxes or large plant containers (e.g. half barrels) to offer sensory and immersive experiences where space is limited.



Plants create opportunities for play.



Sticks from plants create immersive spaces.

F4. REFERENCES

Howard, Lisa with Cassie Bartholomew and Derek Schubert. *Plants for Living Schoolyards*
<https://www.baytreedesign.com/publications>

Poisonous plant list - <https://calpoison.org/topics/plant>

Searchable plant database including plants giving loose parts and immersive experiences
<https://www.playcore.com/plant-database>



Feature 5 | Site Boundaries

The edge to the NEA will be determined in the design process and may be defined by adjacent uses and features in relation to the NEA and at its perimeter. Boundaries can act as a visible delineation but not be overbearing or distract from the immersive experience of the space. Edging, in this context, is simply a way to delineate a zone where children can feel welcomed to be themselves. The boundaries are the areas for entrances and a place where we step out of the urban world into the NEA. In this setting children will create their own vision of play.

F5. GUIDE POINTS

1. Visual markers

Develop visually or physically permeable boundaries to be easily identifiable as visual demarcations.

2. Level of enclosure

Determine if you would like parents and caregivers to feel more secure about letting their children roam freely. If the external boundaries fully enclose a space and there is only one entrance this may be developed as a place for caregivers and parents to relax while their children roam.

3. Enclosure near cars

Provide a fully enclosed external boundary for younger children and in any areas near auto traffic.

4. Boundary materials

Define the boundaries of the NEA with existing or new built materials such as fences, art installations, decks, or a change in ground surface material and/or natural features that create a border such as the water's edge, a steep hillside, planting area, boulders, logs, or a large tree.

5. Additional uses

Design elements that define the boundaries of the NEA to serve



There are many ways to demarcate an edge to a site.

an additional function such as a feet on ground play element, seating, universal design element, or other need. Seating elements in particular are recommended to encourage parent supervision at a distance (without interfering with children’s play).

6. Change in time

Design for flexibility in the boundaries for NEA sites that may change in size and shape over time. These boundaries may be fixed or movable elements. This is dependent on the site context and site operation. Any movable boundary element would require site staff to move it and may not be designed to be movable by the public. Movable boundaries would only be movable by the managers or designers to have flexibility to accommodate a changing site over time.



A nature play area defined by the change in topography and materials.



A nature play area in SFUSD schoolyard.



This small fence indicates the stormwater area in a schoolyard.

F5. REFERENCES

Cooper-Marcus, Clare and Carolyn Francis. *People Places: Design Guidelines for Urban Open Spaces*. John Wiley and Sons, 2nd edition, 1997, 141.

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WEST
PORTAL

SCHOOL

GARDEN

Feature 6 | Welcoming Signage

The signage identifies a given area as an official NEA site and effectively invites and informs the public use of the area. The welcome sign is recommended to be visible at all entrances to the public NEA area. The sign is a tool to identify the site, set a tone (implicitly and explicitly), provide any guidelines, and to provide a place for site specific messages. There are many ways the sign(s) can be included in your project with the guide points provided below.

F6. GUIDE POINTS

1. Entrance location

Locate the signage at all entrances to the NEA site and place to be clearly visible and legible to people as they enter the NEA site and to people passing by the site.

2. Standard NEA sign

Include the standardized NEA sign which is provided as a link in the reference section, and which includes fonts, logos, color, and visual icons. These graphic elements provide a consistent visual that clearly act as a wayfinding piece and provide a clear identity to help users throughout San Francisco find and identify NEA sites.

3. Multi-lingual sign

Provide a sign with multilingual versions including the most commonly spoken languages in San Francisco (Chinese, English, and Spanish) and the neighborhood languages. By including multiple languages, the sign welcomes multiple cultures to the site.

4. Optional message area

Determine if and how to integrate an optional area on the sign for daily, weekly or seasonal messages that can be added by the landowner. This portion could be a chalkboard or other media that supports changing messages.

5. Place-based information

Determine if the sign will include place-based interpretive information. See Feature 11 for more information.

6. Sign materiality

Design the frame for the sign to be contextual to the site and made of wood, metal, or other natural materials that are approved by the jurisdiction and landowner.

Include the sign as a fixed element for permanent sites. Develop a movable and temporary sign for pop-up sites.



The SF Children & Nature Collaborative has designed a welcome sign template intended to be adapted at NEAs across the city, [downloadable](#) for free from the website.

7. Sign “message”

Define the approach for signage. Each owner may have different considerations on the amount of words that inhabit this children’s place. We recommend the idea of “less is more” and letting children define the space. However, if other signs are necessary, we recommend following these guidelines for continuity, legibility and for a harmonious site.

Determine if the sign will include information for Caregivers including informational guides or suggestions for the use of the NEA.



A welcome sign with a space for daily messages.



A welcome sign can explain the values of nature-based play in simple ways. (First Creek Park in Denver, CO)

F6. REFERENCES

SF NEA sign: https://sfchildrennature.org/sdm_downloads/nea-sign/

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Process-oriented features

This section includes the process specific elements that are essential for a successful and sustainable project.



F7
Public
involvement



F8
Management
plan



Feature 7 | Public Involvement

Public involvement is beneficial to the site and community in four ways: (1) the local community has local knowledge of the site which is valuable input and enriches the professional understanding of site constraints and opportunities; (2) the site program can be developed to meet the needs and vision of the end-users and stakeholders; (3) the process can be an opportunity to strengthen community ties and create future stewards of the site; and (4) the process is educational and empowering to the community including the children.

Often public involvement focuses on adult input. The NEA spaces will be used by adults, but the primary users will be children. The UN Convention on the Rights of the Child lists four articles that focus on the right to participate: Articles 12 – 15, which focus on freedom of expression, freedom of thought, conscience and religion, and freedom of assembly.⁶⁰ Working with children, when done thoughtfully, can be very enriching to a project.



Kindergarteners providing ideas for their yard.

F7. GUIDE POINTS

1. Genuine & clear input

Develop a process that is appropriate to the scale of the project that will elicit genuine and clear input and ensure that the design meets the vision and needs of the community.

2. Identify and engage the stakeholders

Identify and engage the stakeholders at the beginning of the process. Listening to the local knowledge is key to understanding the site and can provide a good start to developing trust and a working relationship between the design team and the community.

3. Professional knowledge

Bring your professional knowledge to the community which explains the value of the nature experience from various perspectives may include: play, child development, restorative qualities, connection to wildlife and ecological literacy.

4. Community skills

Develop the management plan as part of the process of working with the community and stakeholders. Determine what parts of the project will be built by professional contractors and maintained by the jurisdiction. Determine what parts of the project

ECOLOGY

- Create an edible garden
crear un jardín para comer la cosecha
创建一个可供食用食物(如水果、蔬菜)菜园
- rainwater catchment system
sistema para capturar agua de lluvia 储存雨水系统
- butterfly garden 蝴蝶花园
jardín de mariposas.
- animal feeders.
alimentadores de animales
动物饲养员
- pond w/ frogs, tad poles, etc.
- add trees to the yard, shade, - mulberry
(w/ seasonal change, colors, leaves, etc.)
- chickens
- compost area
- use native plants / low water plants

PLAY

- Keep active play features
(play structures, etc.) áreas para jugar.
活动场地构思
- imaginative play 想象活动
juegos imaginativos
- outdoor musical instruments
(w/ recycled materials) 户外音乐器(用回收物料)
instrumentos musicales para exteriores
- living play house &/or geodesic dome
dome play house 圆顶活动屋
domo para casa de juego
- outdoor chalk boards for water painting & chalk
户外粉笔板(为水彩笔以及粉笔) pizarrones para pintar agua
- (painted) labyrinth for walking - laberinto para caminar
用笔画的迷宫. 可以在上行走
- game boards imbedded in site furniture - juegos de mesa
在家俱台面嵌入游戏板
- a ball free zone zona sin pelotas
不能玩球的区域
- basketball hoops @ various heights
- terraced play area
- climbing wall
- painted games on the ground

Brainstorming notes for a living schoolyard in SFUSD.

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Feature 8 | Management Plan

The management plan provides a guide for the client and community on how to maintain the space after construction. For the long-term success of an NEA every designer has the responsibility to consider the Management Plan and how the site will be maintained after construction. Sites that are cared for feel welcoming, safe, and protective. They feel like they are part of the community. A management plan is essential for sustaining the quality of experience and the feel of the space.

While the designer can provide information via specifications, site meetings, and/or an owner's manual, including key members of the maintenance team in the design process is important for lasting NEA success.

The manual can include specific information such as life cycle time frames, maintenance needs, and contacts for future needs on maintenance of the site. This information is based on the landowner guidelines and requirements, code requirements, an understanding of the installed materials and systems, as well as an understanding of maintenance for children's areas defined by the NRPA (National Recreation and Parks Association) and other organizations.

During the design process the project will benefit if the design team includes the maintenance staff and community in the design process. By including the maintenance staff, the design team can ensure they are designing to a realistic maintenance plan and the maintenance staff are aware of the long-term project goals. Maintenance staff members are the people who will ultimately be responsible for ensuring that the project remains in the intended condition.

The community can help the maintenance staff by being stewards for the project. The community may be responsible for community-built pieces and identified aspects of stewardship, such as a pollinator garden, following construction. Together the two

groups, maintenance, and the community, can take care of the site.

During the design process the design team may consider developing a defined plan of elements to be maintained by:

1. Client's maintenance staff
2. Other maintenance professionals – consultants or other agency's staff
3. Community and NGOs
4. On-site educational staff with children



How can you include facilities and maintenance folks in your design?

“Natural playgrounds do not require onerous amounts of day-to-day maintenance to keep them safe and viable in the public realm. In fact, decreasing the maintenance of some areas of the playground enhances the play value and the nature connection experience of the children in the space. [...] In order to achieve a successful nature play project, all stakeholders must be involved throughout the design and construction process. This philosophy is likely most important with regards to maintenance.”

– Excerpted from Nature Play in the Built Environment: Design Standards and Guidelines, Denver Parks and Recreation. ⁶⁵



Children benefit from being stewards.



Youth can take on responsibilities.



Volunteers repurpose stumps for nature play.

F8. REFERENCES

Sample maintenance plan - https://sfchildrenature.org/wp-content/uploads/NEA_Maintenance_Plan.pdf

Optional features

These features are optional and are included to supplement and complement the essential elements in a manner reflecting the mission of the San Francisco Children & Nature Collaborative. These elements are valuable additions to NEAs when site opportunities allow:



F9
Climbable
trees



F10
Gardening
area



F11
Place-based
interpretation



Feature 9 | Climbable trees

The *San Francisco Children's Outdoor Bill of Rights* includes "climb a tree" as one of the eleven essential outdoor experiences children should experience in their childhoods in San Francisco. Including climbable trees in an NEA provides opportunities for strategic thinking, spatial awareness, beneficial risk assessment, social skills, and physical strength.

Anecdotal stories of adult memories are abundant with the benefits and joys related to tree climbing but our risk averse society is reluctant to allow this activity in public places. Schools in Berlin have been allowing tree climbing for over twenty years and with it have seen a drop in accidents throughout their playgrounds and a rise in confidence, resiliency and joy in their students.⁶⁶ In Taiwan and Japan, not only is tree climbing allowed, but it is promoted as one of several key measures of individual success.⁶⁷ According to research, tree climbing provides the ten potential benefits listed for risky play in the introduction, and in particular builds problem solving skills, self-confidence, dexterity and physical strength, risk negotiation and spatial awareness.⁶⁸ Children also enjoy trees for a bird's eye view of the world, the thrill of feeling unseen and the imagination and sensory experiences trees provide.



Australian tea trees provide many levels for climbing.



Tree-climbing experiences can be mimicked in the absence of climbable trees. (photo in Japan)

In addition to the emotional and physical benefits of tree climbing, there is evidence that trees can deepen the connection to a place. A researcher in Finland conducted a three-year study looking at children's use of a new space in phases as first outsiders, then explorers, and eventually insiders. His study showed that children progressed to "insiders" more quickly when allowed to climb trees. The areas with trees provided many affordances and versatility which encouraged children to spend more time in a space and become more connected with a place.⁶⁹

Trees take time to mature. Planting climbable tree species now that can support graduated challenges in climbing later is one way to provide for this activity in the future.

F9. GUIDE POINTS

1. Arborist evaluation

Evaluate existing trees with a certified professional arborist for tree health, longevity and climbability. If existing trees are of good stature and good health we recommend preserving and maintaining the trees.

2. Climable tree criteria

Plant trees species such as *Quercus agrifolia*, *Quercus lobata*, multi-trunk *Olea europea*, and *Aesculus californica*, which can provide opportunities for climbing in the future. Considerations for choosing a type of tree for climbing can include these three aspects:

- a. Trees with low branches and an overall low height for less experienced children.
- b. Taller trees with higher branches requiring skill to start and to climb up for more experienced children.
- c. Trees that naturally have strong branches and less chance of breakage.

3. Physically challenged opportunities

Incorporate opportunities for the physically challenged such as a transfer platform at a tree with low branches if this is an activity that will be provided on the site.

4. Child-scaled maintenance

Ask maintenance to prune trees to allow more branches to grow lower to the ground than standard pruning practices in parks and schools to allow children to reach the tree branches. Lower branches will also provide the feeling of more green where planting cannot be included in the ground.

5. Land owner understanding

Work with the Owner/Tenant to understand rules and how they may impact the design.



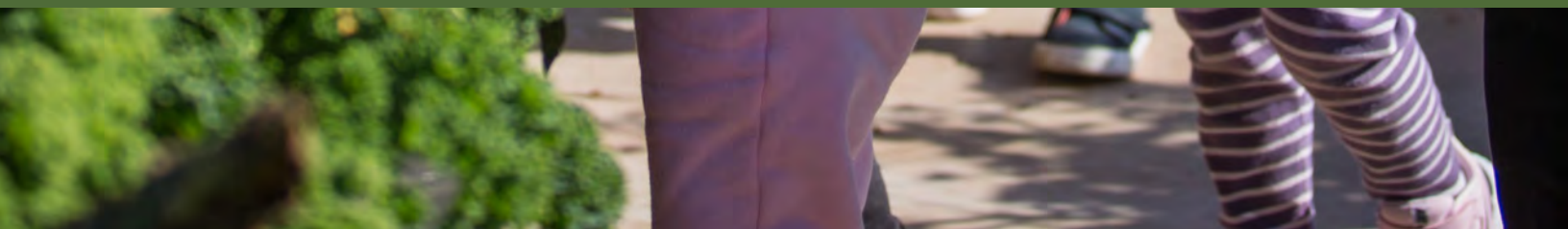
Uprooted sculpture by Bruce Johnson at Castle Rock State Park in Los Gatos, CA.

F9. REFERENCES

LondonPlay | Fallen trees as climbing structures in playgrounds



Feature 10 | Gardening Area



Within the San Francisco *Children's Outdoor Bill of Rights*, two of the eleven essential outdoor experiences are:

1. Harvest and eat a fruit or vegetable
2. Plant a seed and watch it grow

Growing food plants is among the most ancient and powerful human endeavors, with many layers of ecological literacy educational value. Ask modern children where their food comes from, and most will tell you, "from the store" or "from my kitchen," but often they do not connect it back to its source, grown and harvested through the labor of a farmer. Historically, school calendars included summer vacation so that children could help on family farms during the longest and busiest days of summer. These days, most children only know farms from songs or story books. Meaningful exposure to the lessons gained through cultivating plants and animals are not always part of children's lives when they grow up in an urban environment. Small gardens within their schools and communities can offer powerful primary experiences for children, bringing their songs and stories to life, while helping them draw connections.

Gardening is a compelling way to provide health, learning and psychological benefits. Gardening connects children to the natural world through their senses. It affords opportunities to interact with the earth at an intimate level, digging small fingers into the dirt and water, but is also a vehicle to understand connections to soil, air, and water cycles beyond the garden and all aspects of ecological literacy. The act of caring and nurturing for plants helps children begin to think beyond themselves and understand how their actions can affect the world around them. Gardening involves long-term thinking and planning, which helps children develop executive function (mental processes that enable us to plan, focus attention, remember, and juggle multiple tasks). Larger biological concepts like genetics and life cycles can be seen in raising plants from seed and then saving seeds for the next season. When children see something like tomatoes growing on the vine, they have a glimpse into the origins of their food - and the chance to pick and eat fruits and veggies in the garden connects us back through countless generations, reminding us of our place within nature and our dependence on our planet.

This section is dedicated to places, such as schools, daycare centers and community gardens that can provide edible gardens as part of their NEA experience.



Gardening can be part of curriculum in schools.

F10. GUIDE POINTS

1. Permanent plants

Plant fruit trees, perennials including flowering plants, and herbs, in perimeter planting areas, to create a welcome public face to the garden even when annual beds are fallow or bare.

2. Successional plants

Grow perennials and annuals together and use succession planting to ensure that something is always growing in the garden.

3. In-ground plants

Plant perennials in the ground for long term success where possible.

4. Native plants

Include native plants, especially when planning for year-round blooms. These plants provide forage for native pollinators which are fun and educational to see in the garden. These plants could include California poppy, salvias, and specialist pollinator plants such as Dutchman's pipe vine.

5. Raised beds

- Children are less likely to walk on tiny plants when they are in raised beds which are well suited for annuals and perennials.
- Design raised beds in a size appropriate for children to tend, physically reach and bring the plants into the child's natural view, making it easier for the children to engage.
- Design raised beds to mitigate garden pests such as gophers, squirrels and other creatures that may "steal" the children's food.

6. Outdoor classroom

- Add gathering space for an outdoor classroom. The outdoor classroom works best when there is enough space to allow children to circle up and listen to adults and



1. Permanent plants can provide many benefits.
2. Plants can be useful through all stages of their lives.
3. Raised beds make garden maintenance easier.
4. Outdoor classrooms, like this one in an SFUSD schoolyard, work best when adjacent to the garden.

for activities that do not need to take place at the planting beds such as dissecting a flower, tasting vegetables, seed saving and starting plants.

- b. The outdoor classroom works best when it supports the garden prep work and educational activities that do not require the soil.
- c. Plan for educational, gathering, and resting spaces near the garden. These spaces are more meaningful when they are in the garden and co-located to the educational components.

7. Pathways

Provide primary path widths and surface materials to easily allow for people in wheelchairs to access the garden and for wheelbarrows to haul soil and mulch. Wheelbarrows need a minimum 3-foot wide path. Wheelchair requirements are detailed in the ADA. Pathway surfacing material is important to consider to ensure that people who use mobility assistance devices are not burdened with the surfacing.



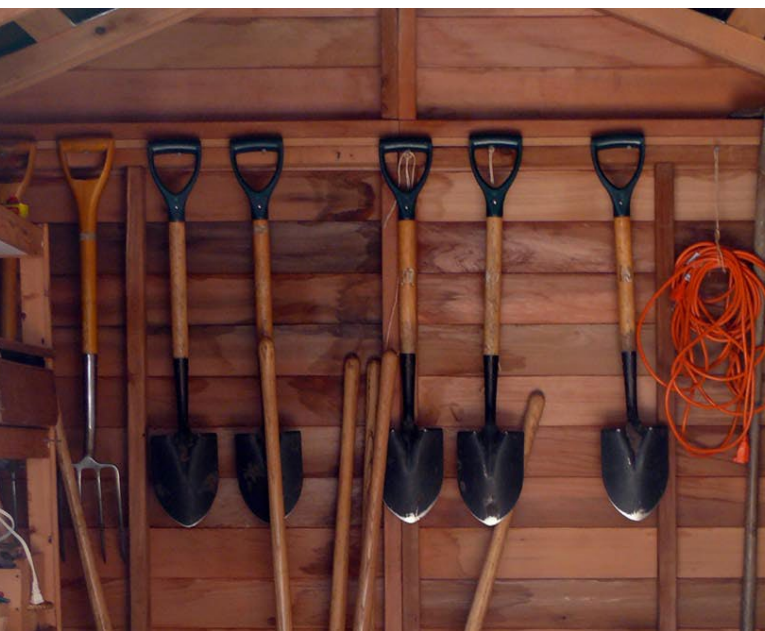
Raised beds at McLaren Park Community Garden.

8. Child-scale

Design the garden to be easily accessed and worked by the size of the children. Outdoor counter heights can be designed for accessibility and an appropriate height work surface for the size of the children. The heights of storage shelves can be designed for easy reach to accommodate right-sized garden equipment such as watering cans and shovels.

9. Support elements

- a. Include support elements, such as tool storage, compost / mulch area, ADA accessible growing areas and a handwashing station.
- b. Provide a hose bib connection within 25-feet of all planting areas. Hoses are typically 25-foot long and longer ones are too heavy for children to move.



Organized tools at Sloat Elementary.



Children harvested apples and are making apple juice in this outdoor classroom.

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San Francisco Master Gardeners | Free helpline to assist home gardeners in San Mateo and San Francisco Counties with questions about home horticulture and pest management.

SF Recreation & Parks Urban Agriculture | Free supplies and educational opportunities. Can provide advice on the design for larger public garden projects.

Garden for the Environment | Onsite and virtual garden education in San Francisco's Public Teaching Garden

California Ag in the Classroom | Network and resources for educators that seek to engage K-12 audiences and improve agricultural literacy.

Junior Master Gardener Program | An international youth gardening program of the university cooperative Extension network

Golden Gate Gardening | The Complete Guide to Year-Round Food Gardening in the San Francisco Bay Area and Coastal California.

National Farm to School Network



Feature 11 | Place-Based Interpretation



Place-based interpretation provides opportunities to further inform and provide interactive hands-on learning about the site's specific ecology, cultural history and sustainability. Place-based interpretation enhances sense of place which connects us in meaningful ways to where we live. Place-based interpretation allows for opportunities to provide relevant details of stories about enduring cultural and natural history of specific sites.

Static forms of place-based interpretation may be elements, such as signs or art with information. Active forms of place-based interpretation embody principles of learning and build on the sense of place through direct observation, investigation, experimentation, and manual skills. Each of the NEA features provides an opportunity for learning about place.

PLACE-BASED EDUCATION

Definition: "Place-based education is the process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science, and other subjects across the curriculum." ⁷⁰

F11. GUIDE POINTS

1. Interpretive elements

- Develop interpretive pieces as permanent or temporary elements.
- Include interpretive pieces as static or interactive pieces.
- Design interpretive pieces to the developmental level of the user and what is the most effective way to engage the user.
- Design interpretive elements with universal design and accessibility in mind.

2. Essence of place

Capture the essence of this place from an ecological process, biodiversity relationship, geology, ways native Americans tended the land, and particular flora specimen and/or fauna of this particular site.



Inner Sunset mosaic steps reinforce sense of place.

"Place is the laboratory providing hands-on materials through the diversity of the habitat and its messages through a community experience."

– Place and Pedagogy,
by David Orr abstract



Owls in Alvarado School ecology mosaic by Paul Lanier for Ruth Asawa.



Another part of the tile mosaics at Alvarado School.



Colorado state bird.



Life-size bird silhouettes at nature study area at Carmel Middle School.



Park seating incorporates local butterfly mosaic at Turk-Hyde Mini Park.



Outdoor painted mural: Salmon cycle at Salmon Creek School.

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p. 55	Maria Durana, SF Children & Nature		

CREDITS

San Francisco Children & Nature

SF Children & Nature is a cross-sector collaborative of youth-serving, health, environmental justice, and nature focused organizations, that works to ensure all children & youth have the opportunity to PLAY, LEARN and GROW in NATURE.

Together, we make it easier for youth to have frequent and quality experiences in nature by:

- expanding opportunities for nature connection in the key realms of childhood — early education, schools, and neighborhoods.
- advocating for places, programs, and policy that support our mission.

We were founded in 2017 as part of the national Cities Connecting Children to Nature (CCCN) initiative to inspire and support cities, city leaders, and their partners to prioritize access to natural green space, outdoor recreation and learning opportunities for underrepresented children.

For more information: www.sfchildrennature.org | info@sfchildrennature.org

Bay Tree Design

Bay Tree Design creates lasting and honest places that engage people. These design principles guide our approach to every project:

- Each landscape - which is shaped by community and climate - can be uniquely beautiful;
- Fundamental design starts with sustaining and enhancing the ecological processes;
- Collaboration creates better spaces and stronger community; and
- Simple design built around the character of the site makes memorable places.

We have worked with clients for over 15 years shaping landscapes with master planning, design guidelines, and design documentation from concept through construction. Many of our projects have been recognized for innovation in sustainable landscape planning, won design awards, and have been built upon our research.

Children's Realm

Bay Tree Design specializes in vital children's places, including public and private schools, NEAs, nature centers, and museums. We create designs based on our research and driven by a genuine interest in and understanding of children's developmental needs, a desire to cultivate joy, and clients' maintenance needs.

For more information: www.baytreedesign.com | contact@baytreedesign.com

CREDITS (Cont.)

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Nature for Every Child, Every Day



www.sfchildrennature.org