NATIONAL PARKS
LET'S MAKE SINGAPORE OUR CITY IN NATURE

DESIGN GUIDELINES FOR NATURE PLAYGARDENS IN SINGAPORE

Acknowledgements

Editors
Lok Yan Ling
Nur Syuhada Limat
Shirley Ling

Advisors
Chua Yen Ling
Dr Kate Neale
Kartini Omar
Sophianne Araib
Tan Jun Chao

With contributions from
Angelia Sia
Jason Wright
Natalie Cheong
Ong Ruici
Russell Lim
Voon Tin Keat

Cover photo
The nature playgarden at KPMG Wellness Garden.

www.nparks.gov.sg
www.facebook.com/nparksbuzz
instagram.com/nparksbuzz
t.me/NParksBuzz
youtube.com/NParksSG
linkedin.com/company/nationalparksboardsg/

To learn more about our City in Nature, scan the QR code below or visit nparks.gov.sg/CityInNature

Share your love for nature and animals at
#NParksBuzz #AnimalBuzzSG

NATIONAL PARKS
LET'S MAKE SINGAPORE OUR CITY IN NATURE

DESIGN GUIDELINES FOR NATURE PLAYGARDENS IN SINGAPORE

CONTENTS

PREFACE

Studies and research have shown that playing in nature enhances children's overall well-being while offering more opportunities for mental, physical and emotional development compared to traditional playgrounds, which have minimal integration with natural elements or greenery. The National Parks Board (NParks) has been developing playgardens to engage children by integrating play with nature.

In March 2019, the Nature Playgarden @ HortPark was launched as the first prototype in Singapore's network of nature playgardens. Developed based on best practices and biophilic design principles, it provides a myriad of play experiences for preschool children, while fostering positive connections with nature within an enriching learning environment. These spaces have proven effective in providing young users with experiences to nurture environmental stewardship that can continue throughout their lives. Since then, there has been a growing demand to incorporate nature playgardens within various developments across Singapore.

NParks, in collaboration with the Singapore University of Social Sciences (SUSS), has completed a study that explored the potential of this nature-based play space in fostering children's well-being.[1] The mixed-methods study analysed data from educators' interviews and surveys, as well as the children's art-based reflective outputs. The qualitative findings revealed various positive observations. For instance, educators reported that the playgarden offers a large palette of natural resources and allows for physical exploration as well as authentic immersion in nature. In the same vein, the children's artwork reflected joyful and attentive learning. The results from the study corroborate the findings of the previous work on nature play and highlight the vast play opportunities of such biophilic and open-ended spaces.

This guide aims to serve as a useful resource for designing, implementing and managing nature playgardens in Singapore.

WHY NATURE PLAY?

Research has shown that play is crucial in the developmental health of children. The Office of the United Nations High Commissioner for Human Rights recognises play as a right of every child[2] as play is essential to their physical, mental and emotional development and well-being. In Singapore, outdoor play often takes place in playgrounds usually found in pockets of residential housing, public gardens and parks.

Playgrounds are generally perceived as controlled and safe environments for children to play in. Although playground equipment is designed to support the growing needs of children, it is often controlled and influenced. Playgrounds like these lack diverse elements that children can use to explore and experiment with.[3]

These are missed opportunities for children to take part in free, open-ended and child-led play, which are critical for honing creative thinking and stimulating imagination.[4]

Figure 1. One of the sessions carried out by a preschool centre as part of the study to explore the potential of playgardens in fostering children's well-being.

WHAT IS A NATURE PLAYGARDEN?

Nature playgardens (also referred to as playgardens in this guide) are outdoor play spaces that are designed to provide play and learning opportunities within an open-ended biophilic environment that encourages child-led play.

Nature-Deficit Disorder

Playing outdoors in streams and woodlands is not as common nowadays. In addition, technological advancements provide highly stimulating content, encouraging children to retreat indoors. With social changes such as parents having to work longer hours and the perceived risks related to outdoor conditions, children have been spending substantially less time in nature. This detachment from nature, which is the essence of Louv's concept of Nature-Deficit Disorder, is a contributing factor to numerous behavioural issues. Spending less time outdoors in nature has been found to be associated with earlier onset of myopia, poorer physical development, elevated rates of emotional and physical illnesses, increased obesity, attention difficulties and diminished use of the senses, as well as reduced interest towards understanding ecological systems and environmental stewardship.[5]

Benefits of reconnecting children with nature

Several studies have shown that children who spend more time playing in a natural environment are physically, mentally and emotionally healthier.[6]

One study on children who used the woods as a playscape found that they performed better in motor skills than those who play in a traditional playground.[7] Another study reported increased levels of attention and attributed the effect to the natural elements which allowed neural inhibitory mechanisms to rest and recover from use, thereby bolstering children's attention and self-regulatory skills. Such environments encourage activities that foster optimal development of the nervous system, which controls processes such as thoughts, memory, learning and feelings.[8]

Natural environments have been reported to stimulate social interaction between children.[9] These are further corroborated by research that shows how active free play outdoors is ideal and essential for the immune system, sensory and motor development, speech development, coordination and balance as well as social development.[10] Lastly, playing outdoors in nature can also forge emotional connections between children and the environment at the different stages of their development.[11]

Biophilia

Biophilia was originally conceived as "the passionate love of life and all that is alive".[12] The term was later popularised by American biologist Edward O. Wilson in his work Biophilia (1984), to describe "the innate, emotional affiliation that humans have with nature".[13] In simple terms, it is about the inherent connection between humans and the natural world.

When play within nature becomes pleasurable, children will begin to associate the natural environment with feelings of happiness, and this process fosters biophilia.[4] Playgardens are designed and developed based on biophilic principles and these gardens have been well received. For example, in a study at HortPark, participating preschool educators documented that the natural space supported learning outcomes in children, and provided various benefits, including mental well-being.

Child-led play

Children are innately curious. Intuitively, they are driven to discover and explore the world they are in. They can become deeply engaged and involved in what they are doing especially when strongly motivated by the experience of what is important to them, at that moment in time.[15]

While structured play has its benefits, such as helping children learn new skills, build strength and coordination, an open-ended child-led play environment provides additional play opportunities which can increase self-esteem, resilience, creativity, motor skills, fitness and even academic performance. Free play allows children to direct activities without the imposition of rules and instructions. Providing children with a space to interact freely fosters a sense of ownership, supporting their development into confident, socially mature and diplomatic individuals.[4,10,15]

Open-ended environment with play opportunities

Play is an essential childhood activity that is supposed to come naturally to a child, with no particular outcome in mind. It is self-directed and enjoyable.[16] The outcome of play is not as crucial as the activity itself.[3] The way children benefit from play is by having meaningful experiences such as doing, exploring, discovering, failing and succeeding.[3] Open-ended play environments are designed to allow for such meaningful experiences, both planned and unplanned, to take place.

Here, we explore the Theory of Affordances that suggests how a person, in this case, a child, can perceive the function of an element or property within an environment.[3] The term "affordances" refers to the possibilities or opportunities for action that an object, environment or situation provides. In the garden, children perceive timber logs as features to climb, sit on, hide behind or jump off. Actualised affordances then refer to "the affordances that are encountered through the individual's independent mobility, action and perception in the environment".[17] An example would be how a child starts off by recognising a leaf within the play environment, and then the act of picking up the leaf from the ground, followed by manipulating the leaves collected by weaving them with softer twigs to make a bowl. This flow of actions differs from one child to another. When there are more actualised affordances, it reflects how well the play environment, and the child complement each other.[17]

Figure 2. Open-ended play environments allow for experiences such as exploring, discovering, failing and succeeding – both planned and unplanned – to take place.

WHO IS IT FOR?

Children

In a playgarden, children have the freedom to play without the constraints of rules at home or in school. This freedom fosters the development of decision-making skills, conflict resolution, negotiation and self-advocacy and the discovery of their own interests.[18] The age range targeted in this guide is between two to 12 years old. However, it is crucial to consider the varying developmental, risk-taking and cognitive skills within this age range while designing the playgarden.

2 – 5 years old

TODDLER TO PRESCHOOL

- Explores their senses and surroundings.
- Discovers their interests.
- Engages in movements such as sliding, swinging, hanging, jumping and tumbling.
- Observes, inspects and interacts with the play space.
- Constructs their world through experience and pretend play.
- Exercises curiosity, wonder, exploration, discovery and pretend play, through asking questions.
- With the transition to middle childhood, they take ownership of their experiences through risk-taking, constructing, experimenting and problem-solving.

5 – 12 years old

MIDDLE CHILDHOOD

- Enjoys challenges and takes some risks.
- Forms strong friendships.
- Engages in imaginative play.
- Expands their play territory. Collects and classifies natural objects.
- Curious about how the world works.

Figure 3. Age range of children and their respective interests when playing.

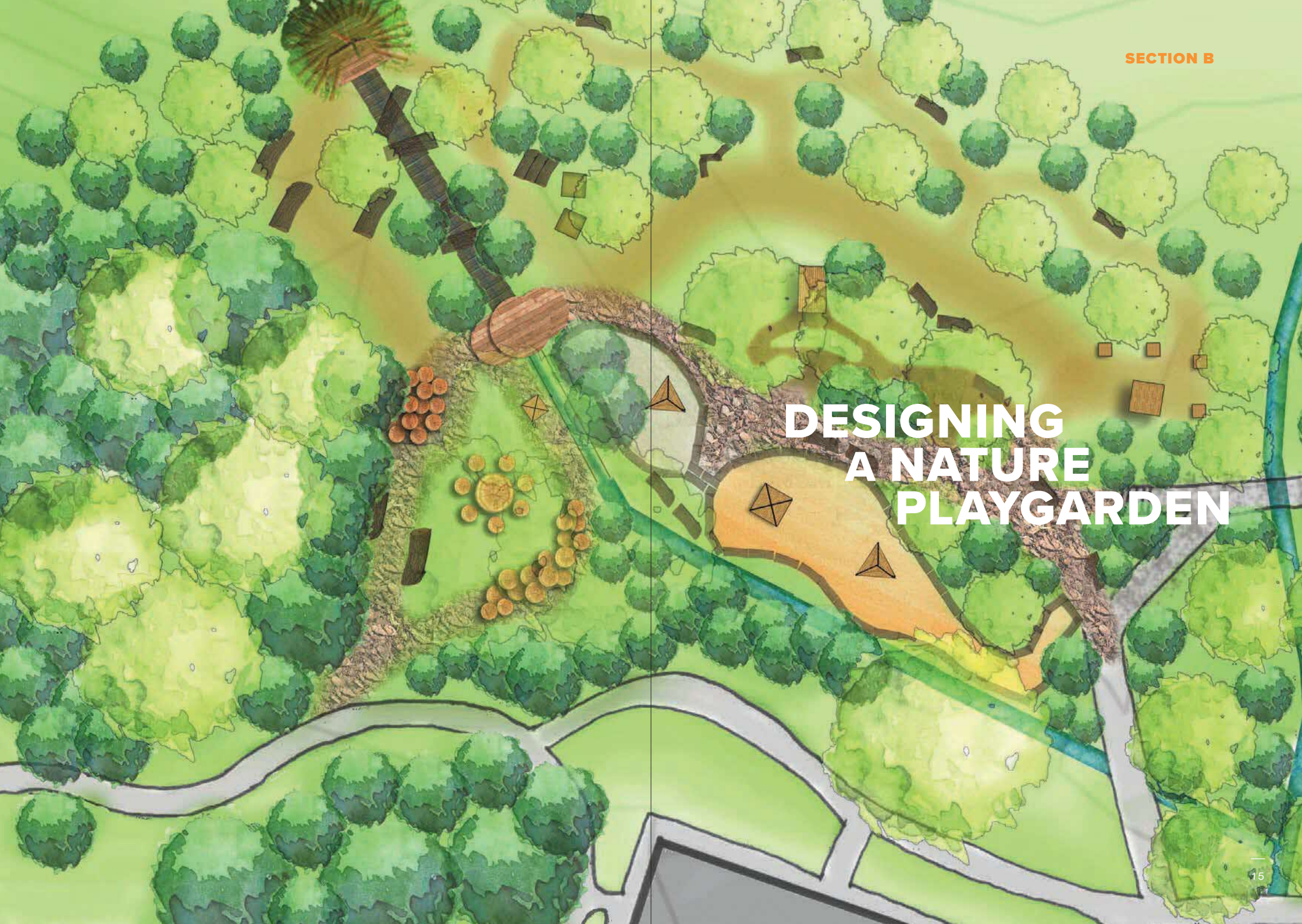
Caregivers

Caregivers can include parents, teachers, elder siblings, helpers or anyone undertaking the role of caring for a child. In a playgarden where child-led play is encouraged, they may act as either observers or facilitators of play. A dynamic interaction between a caregiver and child may bring about benefits to play and learning and this should be supported in the play environment.

Educators in Singapore adopt various approaches. Some follow a more structured programme where the outcome of play is predetermined, where the objectives include the intended learning and developmental outcomes that children need to complete. There are, however, others that follow a more unstructured, child-led approach.

All in all, caregivers play an important role as they determine how much freedom a child can play and therefore how child-led their play can be.

Figure 4. Adults are encouraged to take on a more observatory and participatory approach rather than instructional when in a playgarden.



DESIGNING A NATURE PLAYGARDEN

Like other landscape architecture and design projects, designing a playgarden requires an understanding of the target users and the site's context. After this, key design considerations are applied to meet play needs and provide amenities that support the playgarden's main functions.

This chapter shares recommendations on user engagement methods, factors for selecting a suitable site, best practices for analysing site conditions and guidance on essential design considerations for a playgarden.

UNDERSTANDING USERS

Children

As part of the design process, it is beneficial to engage children in identifying the play factors that contribute to their "dream" play space. Designers can then plan for and work with the physical environment to create a playgarden that can potentially meet the various play desires.

Engagement methodologies

A. Activity-based

- Suitable for children aged three to eight years old.
- Discussion of a child's artwork through various artistic methods such as drawing, dance and photography.

For example, using art-based reflections from children who had played in the Nature Playgarden @ HortPark. These reflections were interpreted for meaning to see how children played within the playgarden.

Images of the drawings and the descriptions were provided by the children themselves (Fig. 5, Fig. 6).[1] These interpretations can influence the design of any future playgardens targeting the same users.

Figure 5. "I did AB patterns using leaves and flowers" – AB patterning is a set of mathematical problem-solving exercises typically conducted in a classroom using different lengths of wooden blocks.

Figure 6. "I found an insect that crawls in a hole" – Many pictures that were drawn depicted children being in nature and incorporated insects they had noticed before.

B. Surveys

- Ideal for large numbers of children aged at least three years old.
- "Yes" or "No" responses.
- Questions are scaled and presented as numbers or through images.
- Open-ended questions.

For example, an evaluation that involved questioning groups of preschoolers on their favourite play area within the playgarden.[25]

C. Focus groups

- Ideal for small numbers of children aged at least 10 years old.
- Sharing of experiences and building conversations around it.

Figure 7. Surveys conducted with bigger groups of young children.

D. Child-led tours

- Suitable for children aged above three years old.
- Letting the child lead you through a space and allowing him/her to describe feelings and thoughts.

For example, having a parent or educator act as facilitators to tag along with a child or a group of children as they play. Reactions of children are then observed, and facilitators can ask children on their thoughts and feelings as they explore a space.

Figure 8. Child-led tours through the site.

Caregivers

Designers need to identify the barriers or negative parental perceptions of nature play that discourage caregivers (e.g. parents and teachers) from bringing their children to a playgarden and allowing them to play independently. Barriers can also be the perceived boredom an adult assumes that a child may have due to the lack of prescriptive or familiar equipment in the open-ended play space, even though children themselves are not bored.[3] Designers should seamlessly stitch potential programmatic opportunities for development and learning, while keeping in mind the play preferences of children.

Engagement methodologies

A. Focus group discussions/Interviews

- Suitable for small groups.
- Can be carried out to obtain qualitative data from multiple stakeholders.
- Allow for exploration in depth and clarifying opinions and views.

Figure 9. Focus groups with parents and teachers to identify design needs before implementation.

B. Surveys

- Ideal for large numbers and generating faster responses.
- Mostly quantitative data through “Yes” or “No” responses.
- Questions are scaled and presented as numbers or through images.
- Open-ended questions can be included.

Figure 10. Survey sessions with teachers and parents of preschoolers.

Figure 11. Design workshop to identify problems and discuss resolutions.

C. Design workshop

- Ideal for small groups with participants of various backgrounds.
- Sharing of experiences and build on conversations.
- Brainstorm and develop a design concept.
- Visualisation through drawings and model-making to identify issues for discussions.

SITE SELECTION

Understanding a playgarden's context and limitations, which may affect its design, can be done with participants in an engagement session. This helps identify the site's strengths, weaknesses, opportunities and threats before designing.

Environmental considerations when selecting a site:

Accessibility
The site should be within walking distance of a vehicular drop-off point, so children can avoid crossing roads.

Vicinity
The site should be near facilities such as schools and childcare centres so that the playgarden is easily accessible to the children from the surrounding area. The site should also be located near amenities like toilets, wash areas and drinking fountains, where feasible.

Terrain
Look for a site with topography that can incorporate slopes into the play area. However, the slopes should not be too steep, and there should be some flat areas to ensure easy movement.

Borrowed landscapes
The site should be within or adjacent to existing natural landscapes, settings or scenic views.

Sun and shade
The site should have both sunny and shady areas, to provide users with open spaces as well as areas for respite.

Conflict zones
The site should not be directly adjacent to roads or cycling paths to ensure the safety of children.

Pollution-free
The site should be located away from areas with sound and air pollution.

SITE ANALYSIS

The analysis of the site should provide a good overview of its strengths, weaknesses, opportunities and threats. An effective playgarden makes use of this analysis in its planning and design development.

Social

- What are the demographics of the area?
- What is the current use of the site and the surrounding areas?
- What facilities or amenities are near the site?
- When are the peak and non-peak hours for users in the area?
- Who are the users adjacent to the site?
- How do users currently move around and into the site?
- What are the current barrier-free access points around the site?

Cultural

- Are there any features of historical or cultural significance in or around the site that can inspire the design?
- Are there any architectural themes in the surrounding area that can be integrated?

Environmental

- Are there any natural habitats, significant plants or biodiversity present in or around the site that can be featured?
- What is the topography of the site and how can it be incorporated into the proposed design?
- How does water flow within the site and is there potential to include water elements?
- How does the sun move across the site during the day, which areas provide sufficient shade, and which areas require more shade?

PRIMARY DESIGN CONSIDERATIONS

Every element within the natural or naturalised landscape can become a potential play element. Leaves, twigs, water and slopes that make up the playgarden provide a more sensorial experience for imaginative play, and act as a myriad of challenges and risk-taking opportunities for development needs at any stage. Fallen leaves and flowers provide an unlimited supply of loose play material for children to use in their own creative way.

Additionally, the presence of biodiversity, such as birds and butterflies, ignites curiosity and wonder in children, facilitating interactions between children and nature.

In this chapter, we will go through the two primary considerations when designing a playgarden.

Designing for opportunities

Play opportunities can be provided through landscape elements, naturally occurring loose materials and friendly wildlife elements. To ignite play in ways that are not possible using the landscape, play equipment and play tools can be provided.

Landscape elements

The naturally occurring dynamics in a landscape offer children sensory experiences and context for their imaginative play.

Figure 12. A rocky dry stream in a playgarden offers perceived affordances such as seeking tadpoles, picking up stones and playing “The Floor is Lava”.

Figure 13. The large aerial roots of a ficus tree within a playgarden provides perceived affordances such as playing “Hide and Seek” and “Catch”.

Figure 14. The grassy slope within a playgarden provides perceived affordances such as “sliding down”, “crawling up”, “rolling down” and “racing up”.

Loose elements

Loose objects can be provided either by using natural materials found on-site or by introducing loose materials or tools. These can be used by children in their creative play.

A. Containment of material

Place loose materials in contained areas to minimise surface run-off during heavy rain. Loose or lightweight surfacing materials are not recommended on a slope as they may also run off during wet weather.

Figure 15. The use of lightweight expanded clay aggregates in a box offers perceived affordances such as “pretend cooking”, “making” and “mixing”.

B. Separation of material

When different loose materials are placed side by side, there needs to be a barrier between them to keep them separate for ease of maintenance.

Biodiversity-friendly elements

The presence of micro-habitats and biodiversity-attracting plants attracts wildlife, thereby facilitating interaction between animals and children. For playgardens that focus on including friendly wildlife, features such as log piles or butterfly gardens can be part of the design.

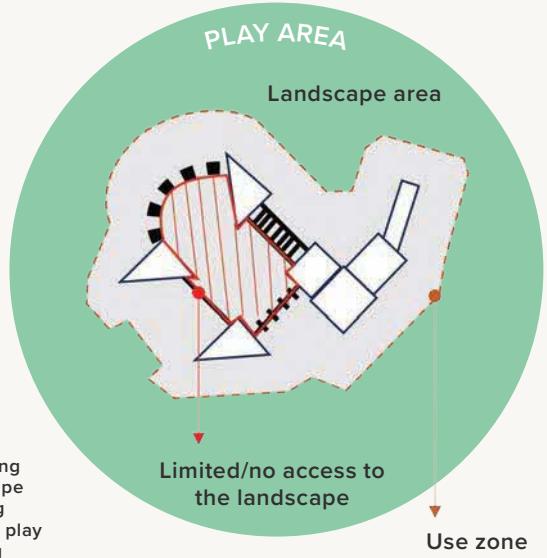
EXAMPLE	PLAY OPPORTUNITIES
Snails	▷ Follow the trails of the snails ▷ Observe the colours of the butterflies ▷ Feed the caterpillars with leaves
Butterflies	
Caterpillars	

Figure 16.
Ropes and swings at a playgarden offer perceived affordances such as “swinging”, “climbing” and “hanging upside down”.

Designed and constructed play features

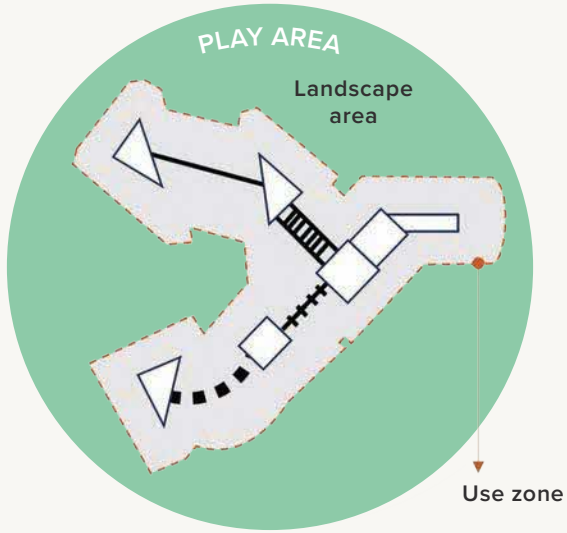
To introduce challenging play for different age groups, designers can include equipment-based play features made from natural or natural-looking materials, or a combination of both. Customising these features helps to integrate the play equipment with greenery and the natural environment.

However, where customisation is not possible due to budget constraints or other limitations, appropriate play features can be chosen from a play equipment supplier’s catalogue, to maximise integration with the natural environment.

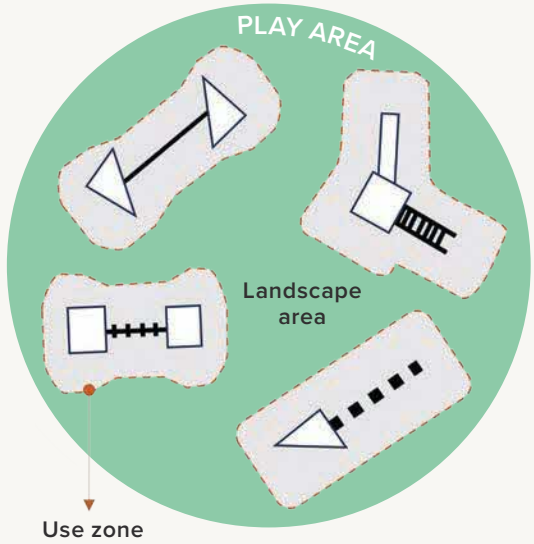


TYPICAL USE ZONE SHAPE

Figure 17. Diagrams showing the comparison of landscape integration when selecting play equipment with same play opportunities but differing positioning of equipment – and by extension its use zones.



USE ZONE WITH A BRANCHING OUT SHAPE



SMALLER, INDIVIDUAL USE ZONES

Use zone refers to the surface under and around the equipment where a child would be expected to land if he/she were to exit from and/or accidentally fall from the equipment. Play equipment that is positioned to spread out is preferred over a one that typically has a mass-like shape as it allows greenery to be incorporated in between the play equipment (Fig. 17). Children can then have access to elements of nature while playing, rather than being limited to nature at the periphery.

To improve integration within the same play area and with the same amount of equipment, consider separating individual play features and their use zones (Fig. 17). This approach allows for selective use of space, rather than clearing a large area for one large structure. Existing trees can be kept or removed strategically to enhance the play experience, with play features that can appear as nodes or hidden surprises within the landscape.

Designing with the environment

Playgardens are designed to be naturalistic, guided by the patterns of biophilic design.[14] The design also considers integration with the existing natural environment, creation of micro-habitats and incorporating sensorial attributes of plants.

There are various ways to shape a biophilic environment, especially if a site has minimal integration with nature. In this guide, these strategies are grouped into four categories:

Physical

This involves using the five senses of smell, touch, taste, sight and hearing through providing visual and non-visual stimuli. This allows for close encounters with the natural world and contributes to a greater emotional connection with nature.

Spatial

Unimpeded views, places of refuge, a sense of mystery and elements of risk bring out the spatial configurations found in nature. These features satisfy our natural curiosity to see beyond our surroundings, explore the unknown and be fascinated by hidden or revealed views.

Comfort

Thermal comfort provided by plants and facilities allow for the recovery and restoration of the directed attention capacity of a user as explained in the Attention Restoration Theory (ART).[20]

Aesthetic

Using natural materials and creating a sensory-rich environment with plants and their arrangements help make the playgarden feel more naturalistic.

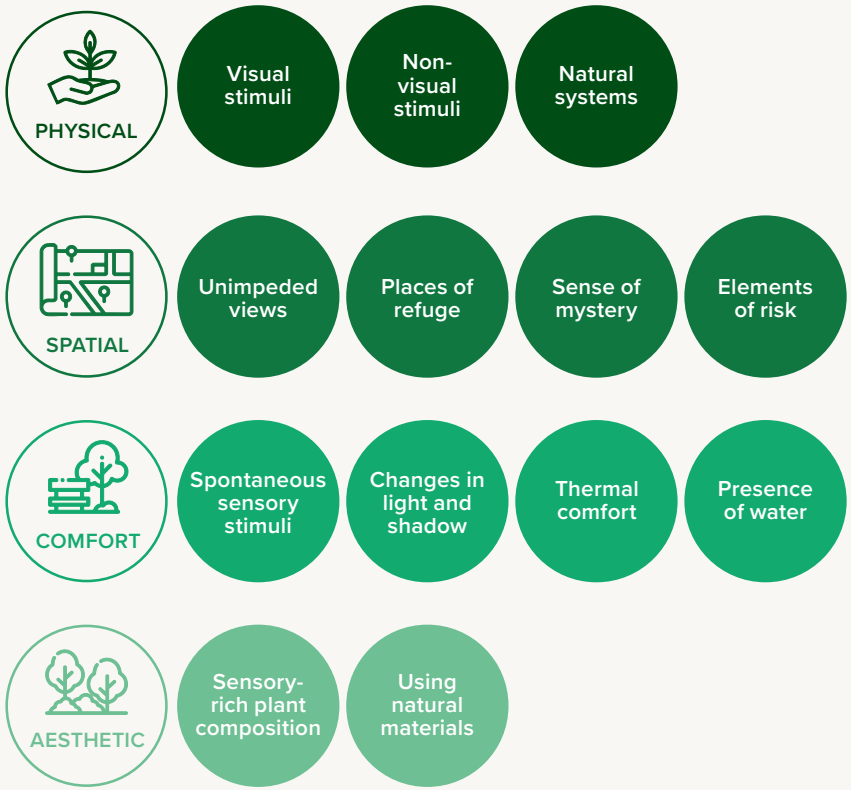


Figure 18. Patterns of biophilic design adapted from Terrapin Bright Green.[14]

Integrating play with the environment

When designing a playgarden within an existing landscape, the design should take advantage of the natural terrain, plants and habitats that can be found in the site. This allows children to be immersed in the environment and promotes emotional connections with nature. Trees and plants should be integrated into the play spaces as appropriate. Interesting biodiversity (e.g. butterflies and birds) attracting plants should be included as part of the play experience.

Hydrology of the site with sufficient drainage should be considered to ensure water run-off during rainy weather will not affect the playgarden in the long run. Safety standards of the play elements should not be compromised.

Figure 19. (Left) Slides and treehouses carefully positioned around tree trunks and aerial roots. (Right) Injecting play spaces within open patches within forested areas.

Figure 20. (Left) Elevated walkways to bring children closer to the tree canopies. (Right) Leveraging on existing tree forms as focal elements within a playgarden.

Creation of micro-habitats

It is important to choose plant species that complement and support the various micro-habitats. Additionally, the plants should be sustainable, and able to thrive in the area. Plant selection should be site specific and based on factors like soil, water and light conditions, to minimise the frequency of fertilising and watering.

Figure 21. Incorporating forest species into a forest-themed zone.

Figure 22. Incorporating riverine species along a waterway.

Figure 23. Incorporating coastal species for sandy surfaces.

Incorporating sensorial attributes

As plants are a key material in a playgarden, their characteristics should be taken into consideration to maximise the sensory experiences that can complement play.

The following are some examples of plants with different characteristics. The list is not exhaustive and plants with similar characteristics can also be introduced.

For more information on plant choices, growing conditions and unique characteristics, please visit **nparks.gov.sg/florafaunaweb**.

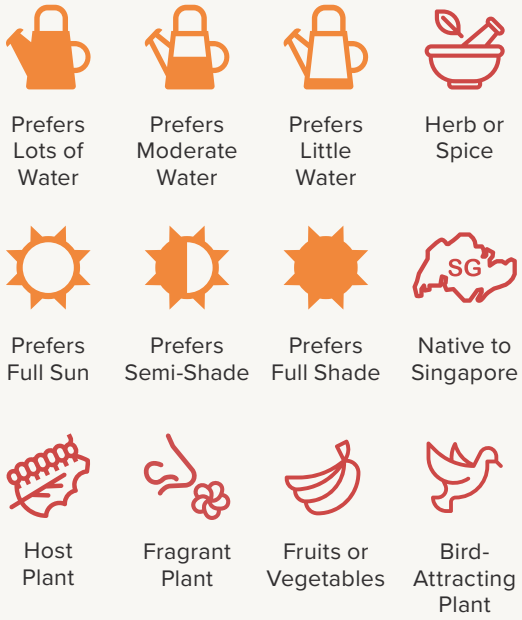


Figure 24. Key symbols for growing conditions and unique characteristics of plants.

A. Colour

Warm colours like red, yellow and orange stimulate the mind and excite the senses while cool colours such as blue or purple create a calming experience.

B. Shape

Plants or plant parts that have interesting shapes or patterns can fascinate a child.

Figure 25. Examples of plants with attractive colours and shapes.

C. Texture

Plants with interesting textures that appeal to the senses of sight and touch can be used to surprise and fascinate visitors. These plants should be placed within reach of all users.

Figure 26. Examples of plants that offer interesting textures.

D. Smell

The scent of plants can evoke memories. Fragrance can be perceived immediately through the perfume of flowers or released through the gentle rubbing of leaves.

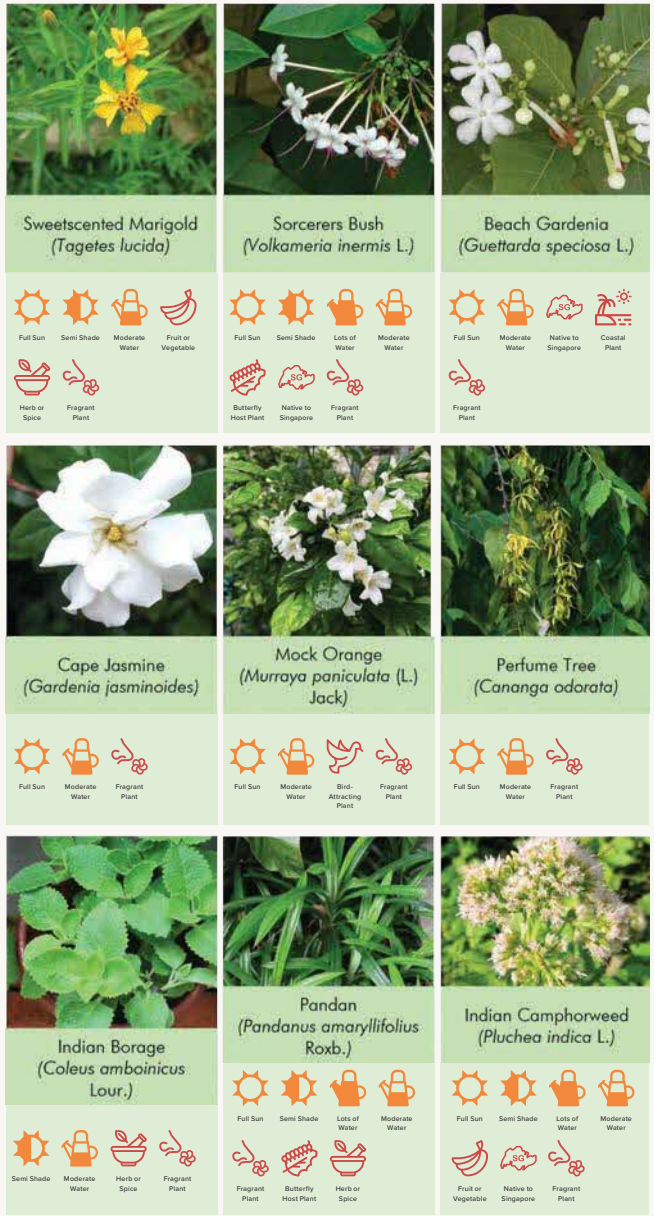


Figure 27. Examples of plants with fragrance.

E. Fauna-attracting plants

Plants that serve as food sources and shelter for biodiversity can be included to create opportunities for observing various species such as bees, butterflies and birds.

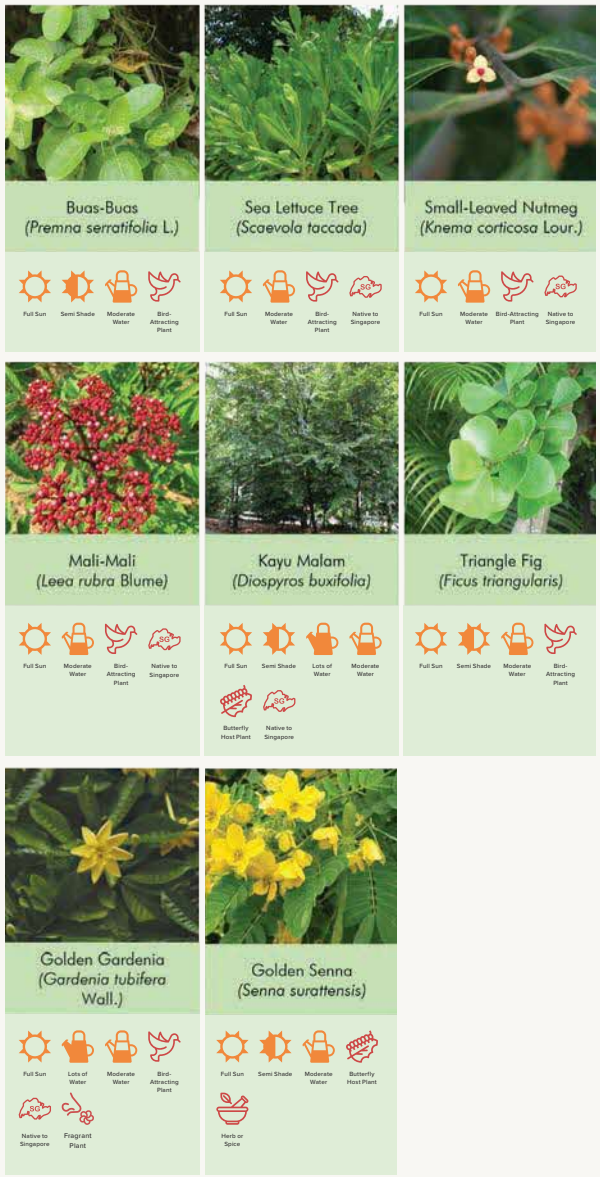


Figure 28. Examples of plants that can attract biodiversity.

F. Edibles

Plants that are used for cooking, like herbs, spices, fruits and vegetables, can bring forth a sense of familiarity and the comfort associated with the foods that are derived from such plants. These plants can serve as an educational element for children, teaching them about the origins of fruits, vegetables, leafy greens, and rhizomes.

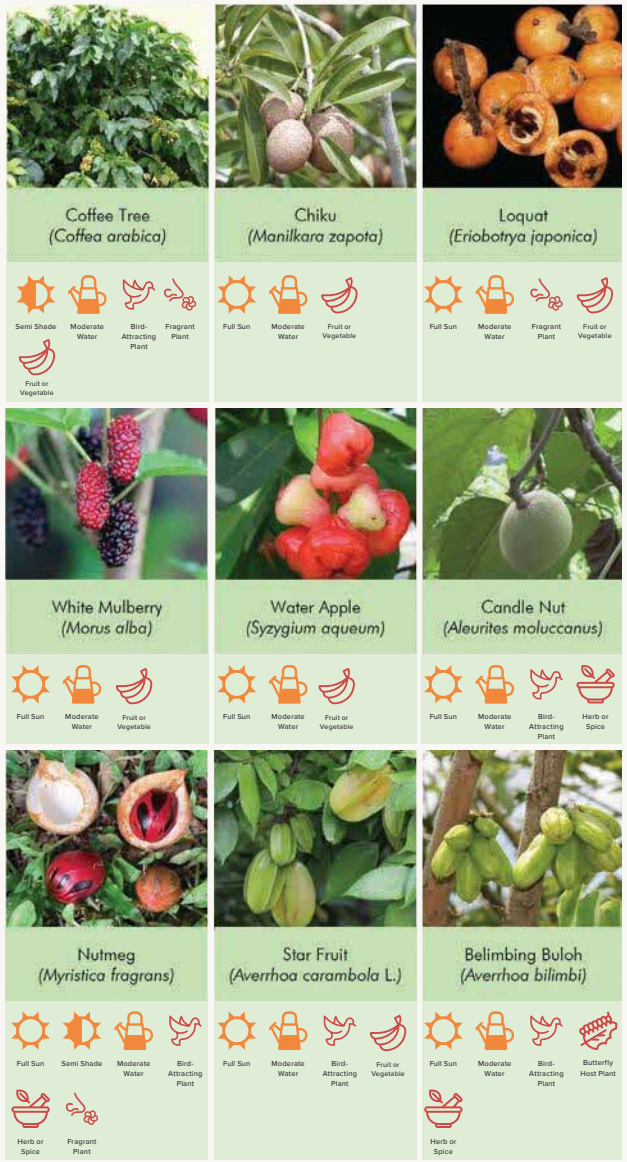


Figure 29. Examples of plants that have edible parts or are used for cooking.

G. Contrast in composition

Plant species with contrasting colours, different leaf textures and tiering of plants of differing sizes can create a captivating scene with many textures.

H. Sound

The gentle rustling of leaves can create a serene and peaceful environment.

Figure 30. Examples of plants that create sound.

Designing with water

Water can come from rain, runoff, washing points or even introduced via new features such as a pond or a small water feature. Whether or not it is part of the play experience, the hydrology of the site (i.e. how water enters, moves through and out of the playgarden) needs to be considered.

A. Waterlogging and overflow prevention

Well-draining soil media, drainage points and sub-soil drainage should be designed and provided for, to prevent waterlogged patches or stagnant pools. Rainwater overflows may wash away loose materials or create paths on slopes that were not intended in the design. In such cases, curated breaks (natural or man-made) along the slope can help to address the surface erosion issue. There should also be sufficient sump pits for easy access to drainage systems (including sub-surface drains) in the event of blockage.

Figure 31. Rainwater overflows washing away loose materials in a playgarden.

B. Vegetated swales

Shallow vegetated swales that are intended to remain wet after rain should be designed so that water can disperse by evaporation. Any natural swale or rain garden should catch and drain the water away before it becomes a safety hazard. They should also be checked for debris that could block water flow and reduce the swale's effectiveness.

C. Water-play elements

Popular with children, water-play elements should be placed in large open areas with enough space for many children to play. If it is located near ground level, ensure appropriate spacing of dry materials (i.e. gravel, stones, etc.) between water features and the ground needs to be maintained. This is to avoid scenarios of constant muddy terrain next to the water element.

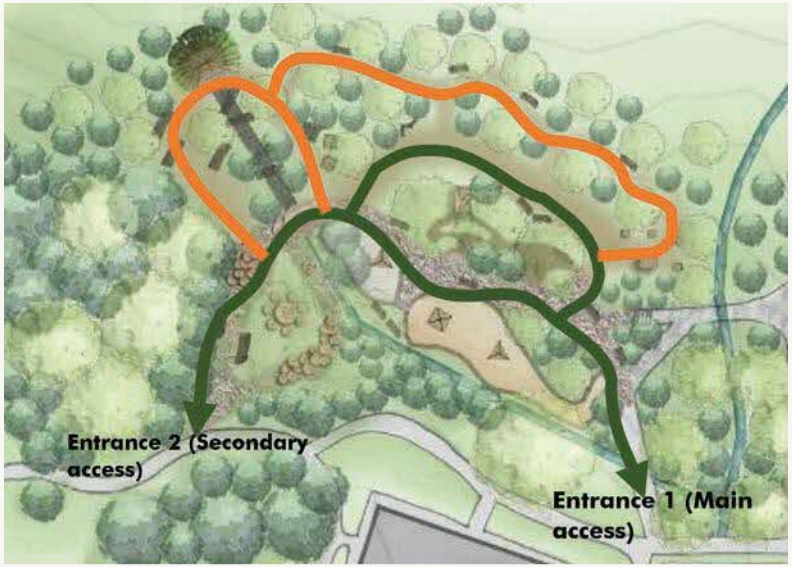
SECONDARY DESIGN CONSIDERATIONS

Spatial Organisation

Access

Entrances into the playgarden should be clear to make it easy to identify where to enter and exit. The entrance locations can be near the drop-off points and surrounding amenities.

Secondary access points can be provided for playgardens that require connections to other gardens or areas in a bigger park setting.



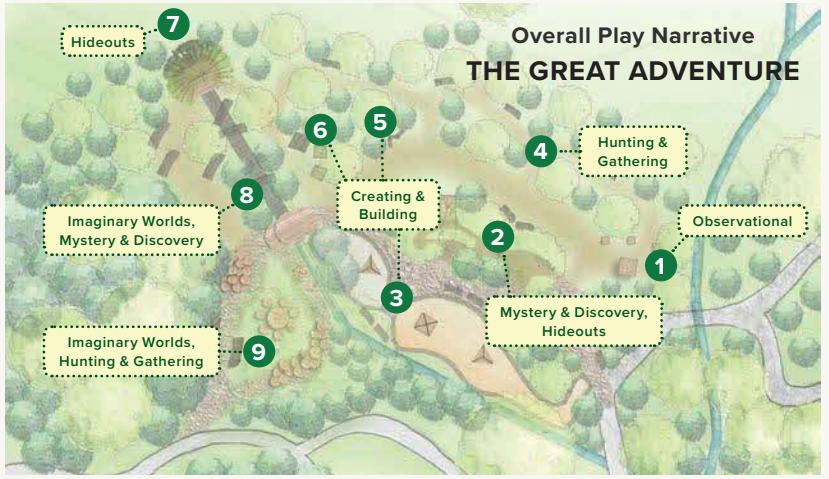
LEGEND

Primary Path
Secondary Path

Figure 32. Entrances along main paths and clearly visible to park users.

Heterogeneous spaces

A more heterogeneous, natural and well-connected playgarden offers greater opportunities for sensory exploration, imaginative play and social interaction.[21] The design of the play spaces within a playgarden should be guided by the play opportunities offered by each space and arranged so that children can easily understand and enjoy the space. Each area should be distinct with memorable components to allow children to navigate and remember the spaces easily.[17]



LEGEND

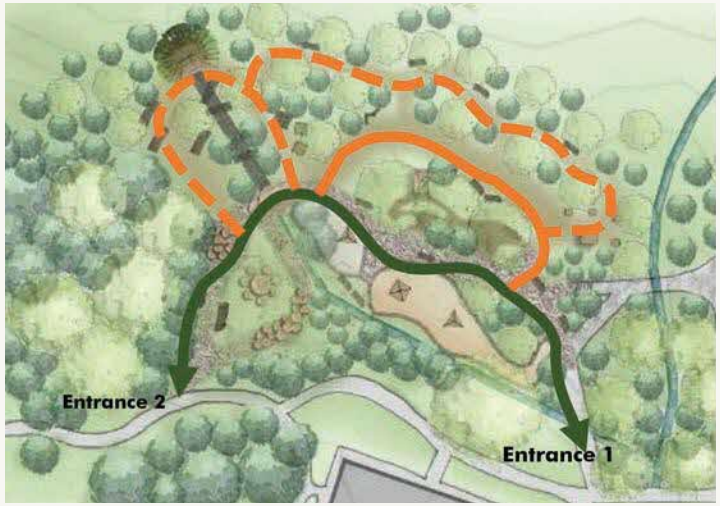
1. The Singing Seeds
2. The Magical Woods
3. The Building Huts
4. The Treasure Trail
5. The Stream
6. The Kitchen
7. The Secret Den
8. The Log Valley
9. The Big Fig

Figure 33. Various spaces for sensory exploration, imaginative play and social interaction.

Circulation

Pathways connect different play zones and spaces together. Paths can also be designed to be part of the play experience. A sense of mystery and discovery can be achieved with the use of visual cues or intermediate play features that can be provided along the paths.

To make paths more interesting, the typologies and materials used for each path can vary according to its hierarchy. Primary paths have the shortest connection from one play space to another, and should have a suitable entrance/exit accessible for all users. Secondary or tertiary paths that may not be explored by all users, can be designed using different materials to create a more intimate or mysterious setting. Paths should be barrier-free and at least 1.2 m to 1.5 m.



LEGEND

- Primary Path
- Secondary Path
- Trails

Figure 34. A layout plan showing a primary path in a playgarden.

Figure 35. A primary path that has a loose pine bark finish material.

Figure 36. A secondary path made up of grass.

Figure 37. A dirt trail as a form of tertiary path for the more adventurous.

Amenities

Amenities should be provided within or near a playgarden for the convenience of caregivers, encouraging them to bring their children and to allow for longer play times.

Figure 38. Open spaces provide endless possibilities for creative play.

Open spaces

Open spaces provide flexibility for groups and families to rest, gather and create more opportunities for open-ended play.

Shelters

Shelters allow individuals or groups to seek refuge from rain and sun. They should:

- Be located within the playgarden itself.
- Allow for clear line of sight to nearby play zones.
- Have sufficient height clearance for both adults and children.

If a shelter is not possible, shade should be provided for respite.

Figure 39. Shelters and shade-providing areas in a playgarden.

Benches/Seating area

Benches or seating areas allow users to rest. They should be:

- Along paths and within shelters.
- Near play elements and spaces to provide caregivers with line-of-sight to their children playing as well as encourage caregivers to play with their children and offer support when needed.

Grouping a few benches together allow for larger group seating and encourage social interaction among children.

Figure 40. A washing point in a playgarden that also serves as a water collection point for children.

Washing points and toilet facilities

Washing points should be located near to but on the outer edge of potentially messy areas such as sand pits or loose-fill surface areas. They can be integrated into the playgarden where children can collect water as part of play.

Although it is not necessary to have toilets within the playgarden, it is recommended for the playgarden to be located near one for easy access for caregivers and children.

Stroller-parking areas

Keeping in mind that playgardens will be visited by families with children, planning for stroller parking prevents paths from being obstructed by improper parking of strollers and minimises conflicts between users of the playgarden.

Rubbish bins

To keep the area clean, rubbish bins should be provided near entrances and exits.

Signage and Visual Communication

Signage content type

Good visual communication and signage design will convey information effectively, improving the user experience. The type of signage will depend on its purpose and need.

For further recommendations on materials for signage, please refer to “Materials and colours” (p. 61).

A. Entrance signs/markers

Entrance signs/markers should be at key locations to mark the start of the playgarden. The design of the entrance sign and its surroundings should make users feel welcome and excited to enter the space.

Figure 41. An entrance sign of a playgarden.

B. Overall information and advisory signs

A sign with advisories and general information helps caregivers understand the risks involved when entering a playgarden and orientate themselves within the different zones. For larger playgardens, these signs can also include:

- A map showing the user's location with a "You Are Here" marker, the main paths and the main play zones.
- Age group recommendations for each play zone.
- An advisory to educate users, especially caregivers, on the importance of responsible adult supervision, as nature play entails some risk-taking and creative play.
- A contact number for people to call during emergencies and the location of emergency medical equipment, such as the nearest automated external defibrillator.

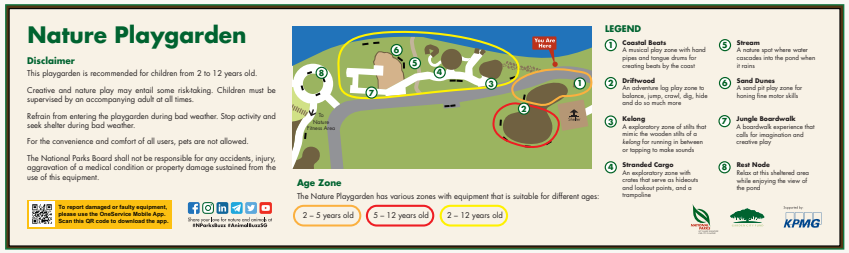


Figure 42. A mapboard example.

**Figure 43.
A directional sign at the junction of two paths.**

C. Directional signs

Directional signs should be placed at various intervals within the playgarden. These will orientate and inform users of nearest exits or nodes. Directional signs are especially important for larger playgardens with multiple play zones, paths and access points. Directional signs should be located at key decision points such as at the junctions of paths.

D. Play zone markers

Play zone markers are used to identify different play areas and indicate the recommended age group for each zone. In some cases, naming of play zones can contribute to the larger narrative of the playgarden. By having markers in each play zone, users can identify their location easily.

Figure 44. A play zone marker in a playgarden.

E. Interpretive signs

Fun facts, educational snippets or interactive tools can add to the play experience of users. For children, these can ignite interest and curiosity which encourage the use of the elements within the playgarden as part of their play experience. For adults, these can provide tips or suggestions on how they can engage their children. This can be done by providing QR codes linked to an array of online resources that adults can use as part of their play activity with the children.

Figure 45.
An interpretive sign.

F. Plant labels

Information such as the common and scientific names, origins and interesting facts of plants found in a playgarden can be displayed on plant labels. Smart technology such as QR codes or the use of digital applications can also be incorporated to allow users to access further resources through their mobile devices. The knowledge will be useful for caregivers to share or incorporate as part of their learning-in-play.

Figure 46.
A set of plant labels.

Signage design considerations

A. Legibility

- Fonts should be easy to read on all materials and finishing. It should not be too thin or cursive.
- Fonts should be easily available in common computer software.
- Designs should be simple with minimal text, good colour contrast and large fonts or images.
- Recommended minimum height of fonts should be 10 mm (typed), 20 mm (handwritten).
- Ink and finishes should be UV-resistant and durable for outdoor environments.

B. Child-friendly

Signage that is intended for children should be simple, short and clear. They should be of appropriate height for the young users to read. The material should not have pointed edges and be free of splinters. Recommended font types include:

ABCDEFGHIJKLMNOPQRXTUVWXYZ
abcdefghijklmnopqrxtuvwxwz
1234567890

Figure 47. Comic Sans MS font.

ABCDEFGHIJKLMNOPQRXTUVWXYZ
abcdefghijklmnopqrxtuvwxwz
1234567890

Figure 48. MV Boli font.

ABCDEFGHIJKLMNOPQRXTUVWXYZ
abcdefghijklmnopqrxtuvwxwz
1234567890

Figure 49. Segoe Print font.

RISK MANAGEMENT

Nature play inherently involves some elements of risk-taking. While play is fundamental to how children explore and understand the world, and positively associated with physical activity and social health, it has been observed that parents have become more concerned over injuries and accidents associated with playgrounds.[19] This has led to the provision of play spaces today that are deemed “too safe”.[22]

However, studies have shown that risk-taking as part of play will give rise to physically stronger children, who are less likely to be injury prone as they are challenged both physically and mentally.[10]

Our challenge is to create a play environment with appropriate risk levels where children can have the opportunity to make choices and solve problems on their own. Such spaces can develop a child’s self-confidence, social skills and resilience.[23]

UNDERSTANDING RISKS

When designing play opportunities in a playgarden, some elements of suitable risk level are needed to engage and challenge children, to support their growth, learning and development. Appropriate risks or challenges can be in the form of features that have moving parts as well as changes in levels and gradient. These allow for opportunities for dynamic, physically challenging play, so that children can overcome fears and feel a sense of achievement when they do so.

However, there is a need to be mindful of unnecessary risks and hazards that children may not be able to identify and assess. These include sharp edges, unstable structures and gaps that can trap limbs, heads or fingers.[22]

Planning for risk management

This guide does not replace existing industry playground safety standards. Designers and managers of a playgarden should establish a systematic risk assessment and management protocol to provide a stimulating play environment for their intended users while eliminating exposure to unacceptable risk or harm. A Certified Play Safety Inspector (CPSI) should be engaged to assess and inspect the safety of playgrounds and other play spaces.

Determine applicable design standards and standards of care

Singapore currently does not have national design standards for nature play spaces like playgardens. Standards of care for a playgarden should be the same as a playground because both are designed and intended for children to use.

Here is a list of relevant Singapore Standards:

- **SS 457** Specifications for playground equipment for public use (or latest edition).
- **SS 495** Impact attenuation of surface systems under and around playground equipment (or latest edition).

For the development of new playgardens, a design proposal should be developed with input from landscape architects or play consultants including a CPSI to advice on play safety. This should be developed early in the design process and reviewed at every design stage. This will help avoid the need for significant changes during implementation.

Conduct a risk assessment for play equipment

A playgarden can include equipment that is fabricated, supplied and installed by a playground equipment supplier. It may also include those that are designed and built by a contractor.

A. Manufactured play equipment

Designed, fabricated and installed by a playground equipment supplier. Includes off-the-shelf and customised items that are designed to comply with the International Play Equipment Manufacturers Association Certification (IPEMA). If not, compliance with SS 457 and SS 495 should be requested.

Figure 50. Examples of manufactured play equipment in playgardens. (Clockwise from top left) Sand digger, climber nets and nest tower with climber nets.

B. Design & Build play equipment

Design & Build play equipment refers to play features that are designed by landscape architects, architects, etc. and constructed by a building or landscape contractor.

Regardless of play equipment type, assessing for risks and hazards should be done by a professional such as a CPSI who is trained to look out for the safety requirements as per SS 457 and SS 495. When developing a new playgarden, the project owner should consult a domain expert to review the proposals and plans and engage a CPSI who should inspect all equipment in a playgarden, whether manufactured or constructed, to ensure compliance to local standards before opening the playgarden to users.

Figure 51. Examples of Design & Build play equipment in playgardens. (Clockwise from left) Log play feature, sand play wall feature and sand play table.

Conduct a risk assessment of natural features and the environment

Since playgardens are designed to incorporate natural elements, the environment of the playgarden should also be assessed to ensure that the risk and hazards presented are acceptable for the intended audience. These would include the removal of dead branches on shrubs and trees, regular inspections of trees, and removal of thick layers of leaf litter which act as water collection surfaces for mosquito breeding.

Develop an inspection routine

An inspection routine is a schedule that facilitates the identification of potential hazards for each setting in a playgarden on a regular basis. This is necessary as the play and natural features in the playgarden may be affected by weather changes, wear and tear, and vandalism, which may give rise to new hazards that were not there before.

Inspections should be carried out regularly as long as the playgarden is open. There are usually two types of inspections:

- Preventive maintenance routine – Regularly scheduled (e.g. once every six months) to prevent unexpected failures of any components or features.

- Routine monthly inspections – A routine visual inspection to ensure that all components and features are in good working condition.

Documentation and evaluation

Inspection routines, which include both preventive and corrective maintenance, should be properly documented. This is to demonstrate a conscientious approach to providing a safe play environment. Inspection records should also be regularly reviewed, including the updating of site management and practices as part of knowledge management.

Communication

Communicating the commitment and responsible approach to risk management is important. Use signage with clear information on play etiquette and provide a helpline number for users to call if there are any problems. See “Overall information and advisory” (p. 44).

General design considerations for safety

According to the National Recreation and Park Association (USA), the four major causes of death and debilitating injury in a playground are:

1. Entanglement of clothing, strings or ropes.
2. Falls onto hard underlying surfaces.
3. Head and neck entrapment in equipment openings.
4. Impact by tipped or loose equipment or moving swings.

Other contributing factors include improper use of equipment, poor supervision by caregivers, inappropriate design of equipment, installation errors and site planning issues.[24] The recommendations below introduce some of the major hazards and basic measures for a safer play environment. This guide does not serve to replace the need for and role of a CPSI.

Figure 52. Examples of entanglement hazards.

Entanglement prevention

Entanglement is a condition in which the clothes worn by the user or strings around the neck of a user become caught or entwined on a part of a play feature. This could be in the form of a bolt and nut of play equipment or even a tree branch.

When such entanglement hazards are present, there is a need to remove or level the component that causes entanglement to the recommended specifications as per SS 457.

Figure 53. Examples of areas to check for entrapment hazards in a playgarden.

Entrapment prevention

Entrapment is any condition that impedes withdrawal of a body or body part that has penetrated an opening. This is commonly observed when a child can push their torso through a gap in a fence, but not their head. This will result in possible strangulation due to head entrapment.

To prevent this, gaps of openings should follow the recommended specifications as per SS 457.

Figure 54. Examples of protrusion hazards.

Impact prevention

Impacts can become serious when there are projections that can spike, pierce or stab a child, enter an eye socket or bruise an internal organ. These projections should be removed, levelled, shortened, widened or chamfered to the recommended specifications as per SS 457.

Prevention of injuries due to falls

There are two ways to reduce the risk of falls:

A. Railings or barriers

If there are any level changes, the design should try to level them out where possible. If not possible, and there are play surfaces that are elevated or above a maximum height, there is a need to introduce appropriate fall prevention measures such as providing guardrails or barriers. These measures are indicated in SS 457.

B. Sufficient use zones

Designated play surfaces with fall heights should have adequate use zones. Use zones are the surface under and around the equipment onto which a child accidentally falling from or exiting from the equipment would be expected to land. Protective surfacing such as sand, pea gravel and/or pine bark are recommended materials and are applicable for play features that have a falling height of above 500 mm as stipulated in SS 495.

For detailed specifications of a loose filled material, the assessor must conduct a drop test in accordance with SS 495 to determine the critical height of the surfacing they have provided.

C. Slipping hazards

Avoid using bead-shaped surface materials like clay balls or round pebbles as loose and interactive elements or surface material. This is because the material can act like ball bearings and become a slipping hazard. This increases the risk of falls and injuries.

D. Clear paths

Paths that are meant for children to explore or run through should have sufficient clearance to prevent them from running into branches of plants. Planting within such areas is also key to ensure the growth of plants will not encroach onto the path, which may cause tripping hazards or protruding hazards. For example, a maze with walls that are made up of plants should not have plants with low branches that may grow and stick out eventually. Plants with long, drooping leaves should also be avoided so the users will not trip over the leaves.

Boundaries

To prevent children from running onto roads, colliding with other users or activities that may cause harm, and entering unsafe areas outside the playgarden, appropriate boundaries should be provided.

A. Soft boundaries

Soft boundaries such as bunds or plants can be used to define a boundary yet soften the perimeter of the playgarden. A boundary type that makes use of terrain or greenery visually becomes part of the landscape rather than a physical boundary.

Figure 55. (Left) A sandpit is enclosed by shrubs and a soft, temporary rope fence to stop children from running onto the nearby bike path. The fence will be removed once the plants are more established. (Right) The play area has a bund along its perimeter which stops children from dashing across the park connector on the left.

B. Hard boundaries

Hard boundaries such as fences or walls can be used for areas with sudden changes in levels such as a pond edge within a playgarden. This can also be combined with plants to create a softer effect.

Figure 56. While the least aesthetic, walls and railings are necessary to demarcate areas with higher safety concerns, such as conflict zones or a sudden drop in level. A mix of low walls and railings prevents falls, while greenery helps to soften the hard edges of the boundaries.

Visibility

Play spaces within the playgarden should be visible from resting areas such as shelters and benches to allow caregivers to supervise the children.

For areas with heavy planting, trees with more porous and raised canopy growth forms can be used to allow visual porosity from one space to another.

Play areas should also be visible to deter inappropriate activities.

Age separation

In play zones for different age groups, it is recommended to keep the spaces physically separated or divided by physical barriers. However, barriers should allow visibility between the zones such that older, younger children and their caregivers can still see each other.

Each play zone should have a sign that clearly indicates the intended user age group and any play features unsuitable for the group should be removed.

Play features should also be age-appropriate and at the same time allow participation by the physically challenged, in tandem with other users, without any spatial discrimination.

Natural features

Plant selection

Plants are an important part of playgardens. As children interact with plants, it is crucial to select suitable ones. Avoid plants with toxic or irritating sap, or have hairs or surface oils that may irritate sensitive skin. Also avoid plants with spikes or thorns on their stems that may prick children's skin.

If they are needed for providing good shade, or have other features that may be useful in a playgarden like showy flowers, it is best to keep them away from paths and out of children's reach. When selecting trees, avoid species that have weak branches and choose trees that are suited to the site's growing conditions. For more guidance on plant growth habits and examples, refer to online resources such as NParks Flora & Fauna Web.

Foreign objects and unwanted fauna

Since playgardens are designed to incorporate the natural environment, foreign objects in the playgarden environment and on the play features such as unwanted plants (weeds), algae, fungi, debris and sharp objects, need to be frequently removed for safety.

Figure 57. Examples of areas with fungi and ant nests.

Harmful insects or animals that may become pests or dangerous to the users in the playgarden (such as bees, hornets, snakes, red ants, moth caterpillars and termites) should be removed as well.

Figure 58. A termite track on a tree branch poses a hazard to users.

Lighting

The recommended average lux level requirement for a playground is 20 lux, with the darkest spot a minimum of 6 lux. Similar lux levels can be applied to a playgarden. In areas with dense planting, care must be taken to ensure that lighting fixtures are not blocked by leaves and branches that will affect its efficacy. Regularly pruning of plants around such light fixtures is required.

Equipment labelling and signage

Any manufactured equipment installation tags should include supplier name, month and year of installation.

Signage and labels should be weather resistant and vandal proof. Signs that are made up of natural materials should be treated with weatherproof coating. The signage should not pose a tripping hazard when placed on the ground, especially during nighttime when visibility is low.

Figure 59. An example of signage that has faded due to the weather.

Materials and colours

A playgarden may consist of many materials and therefore colours. Below are some recommendations when selecting materials and colours for features within a playgarden:

- Colours of the play features should be contrasting to the colours of the surfacing material to prevent tripping.
- Materials used should be durable and not easily flammable.
- Materials that users will come into contact with should not become burn hazards when the surface is heated by the sun.
- Metals subject to structural degradation, such as rust or corrosion, should be painted, galvanised or treated.
- Wood intended for play should be tropical hardwood like Mahogany and Rosewood. This is to maximise longevity of the wood used.

The timber used should be debarked, seasoned (dried) and treated to resist rot and insect damage. Chromated copper arsenate (CCA), creosote, pentachlorophenol, tributyltin oxide and surface coatings that contain pesticides are not recommended for play features or equipment.

Structure

Footings for all features within the playgarden should be designed with structural systems endorsed by a Qualified Person (QP). This is to ensure the structural integrity of a feature within a playgarden is maintained and not easily loosened or toppled over. This applies not just to play equipment, but to features such as signage, benches, railings and seating.

Lightning protection

The playgardens will also need to comply with the provision of the appropriate lightning protection system according to **SS 555 Code of Practice for Protection against Lightning**.

Inclusivity

Where inclusivity is part of the playgarden design, main pathways should have a minimum width of 1.8 m and made of material suited for wheelchair-accessibility. This allows the play zones to be safely accessed by everyone. The environment and all the playgarden features should follow the BCA Universal Design Guide 2016 (or latest edition).

For all play features/zones, it is recommended to provide secondary paths as “escape routes” between main access points. This allows children who wish to stop and exit halfway. This will give them a greater sense of security as they play.

MAINTENANCE AND MANAGEMENT

Wear and tear is unavoidable. Therefore, maintenance is needed to ensure the design remains safe for users. It also maintains a certain level of aesthetics and provides visitors with a sense of security.

Understanding common maintenance issues and the management required for a playgarden—often differing from a standard playground—is necessary to sustaining a successful play space.

COMMON MAINTENANCE ISSUES

Play Environment

Water

According to **SS 556 Code of practice for the design and management of aquatic facilities**, any water play elements should be checked frequently to clear any debris and foreign objects that will impede the water flow and reduce the efficacy of the water feature. Water quality checks should also be in accordance with the same code of practice.

Surfacing

Surfacing here refers to the loose-fill material used for play zones, such as sand pits, pea gravel pits and pine bark play zones. These areas should be observed for potential water-ponding that may result in mosquito breeding zones. There may also be areas of compaction or erosion of loose-fill surfaces such as sand, soil and gravel that can bring about depressions or changes in level and trapped air pockets within loose-fill surfaces that may result in hidden potholes in the future. These may eventually cause waterlogging and may become a slipping or tripping hazard.

A. Levelling

If a playgarden was constructed on true ground, regular topping up of the loose surfacing materials should be carried out periodically to account for the sinking of the surface over time due to compaction or erosion. Soil erosion and hydrological flows in a playgarden should be monitored even after implementation. Where needed, counter measures must be implemented to avoid hazards that may arise from uneven ground levels.

B. Sieving of material

To ensure any loose-fill surface play area is safe and clean for use, regular sieving or loosening of materials, like sand or pea gravel, needs to be carried out to remove trapped air pockets, compacted surfaces and foreign objects that may pose as a hazard to users.

Softscape

This refers to the horticultural elements that make up the playgarden, such as trees, shrubs, grasses, flower beds and groundcover. When maintaining softscape, consider these:

A. Regular plant maintenance

Plants need regular maintenance to prevent overcrowding. Regular dead heading and replacement of shrubs that have become leggy over time should

also be carried out to ensure an aesthetically pleasing environment, so users continue to feel safe in the garden. It also maintains opportunities for users to engage with plants. A scheduled shrub replacement programme is recommended to maintain a lush playgarden all year round.

B. Fallen fruits and leaves

Fruiting trees or shedding plants, while nice to observe, will need special attention to minimise build-up of fallen debris and pests that may follow. Regular maintenance of fruit trees or areas with fallen leaves serves to prevent nesting of any wildlife such as snakes, especially in hidden or dark spaces.

Figure 60. Potential mosquito breeding zones.

C. Horticultural pests and diseases

Spotting and clearing of pests and diseased plants need to be more frequent in the playgarden due to the denser planting. Mealy bugs and sooty mold on leaves should be removed quickly before they spread in the dense planting beds. Termite mounts on ground and termite tracks on tree trunks need to be treated for safety reasons.

D. Plant parts as hazards

Plants require regular checks for broken or dead branches, especially those close to the ground where they are more accessible. There is also a need to observe for surface roots which may cause tripping hazards as well as protruding branches which may cause injuries. While trees provide shade and thermal comfort, they need to be monitored closely to ensure there are no overhanging dead branches.

E. Use of fertilisers

Organic fertilisers and pesticides are preferred over chemical ones to prevent incidents arising from accidental consumption or interaction with leaves in the playgarden.

Play elements

Loose materials

Recommended loose materials to use include sand, pea gravel and pine bark. Loose materials that come from the natural environment of the playgarden can be in the form of dried leaves, fallen flowers and even branches.

Play tools

For any provision of loose handheld play tools, proper signage and storage need to be considered to avoid children from bringing them home or to avoid frequent replacement of damaged tools. Alternatively, encouraging users to Bring Their Own Tools (BTOT) can be explored.

Material

When using organic materials such as bamboo as part of a play feature, care must be taken to sand down the edges and replace the bamboo over time to reduce the likelihood of splinters arising from degrading bamboo.

If natural timber is used, it should come from sustainable sources such as timber from felled trees in parks. Tropical hardwood species such as Mahogany are preferred. However as per all natural elements, timber is prone to splits and splinters, and damage by small animals such as squirrels over time. A scheduled replacement regime for such natural materials should be in place if such material is considered in a playgarden.

Any feature with timber elements should avoid direct contact with water, either by elevating on concrete or by surrounding it with gravel. For elements that are submerged in water, Bakau is recommended as its structural integrity is strongest when placed in water.

The use of composite materials for play elements is also recommended for structural maintenance and to achieve better sanitation standards. These materials can adopt a “natural” finish suited for a playgarden.

The growth of fungi and algae on play elements that are constructed out of natural timber is a common problem, especially in our humid environment. Those accessible to users should be removed to prevent accidental consumption and avoid slipping hazards. For example, fungi growing on balance beams or stepping pods should be removed as users might slip due to the slippery texture of fungi.

Figure 61. Breaking down of wooden play equipment.

PROGRAMMING

Providing children with frequent opportunities to encounter nature through unstructured play outdoors and structured nature-based activities supports their well-being. Caregivers may support a child's time in nature in many ways.

They can, for example, model how to interact with nature, facilitate exploration in greater depth, introduce skills with complexity and bring along interesting tools and material that aid exploration. This chapter offers caregivers a variety of ideas to engage children and nurture their connection with the natural world.

Figure 62. Children initiating play during their nature walk with a staff from the Singapore Botanic Gardens.

Figure 63. Children experiencing multi-sensory elements during their nature walk.

NATURE WALKS

Walking is a wonderful way to experience nature and a central pillar of discovery. It incorporates movement, observation, and decision-making skills and has even been shown to have therapeutic benefits.

It is also an activity which provides children the freedom to direct their own learning and play. In contrast with structured learning environments that can be sedentary and prescriptive, outdoor time in nature often occurs where children can explore and make discoveries. The following section shares tips for taking children on nature walks.

Tips for walking with children

Plan ahead

Before embarking on a nature walk, take some time to plan the outing. Choose a suitable location that offers a variety of natural elements, such as trees, grassy lawns, hills or a nearby body of water. Research the area and visit the site to ensure it is safe and appropriate for children. Consider the weather conditions and pack accordingly, including hats, raincoats, snacks, water and a spare change of clothes.

Accessibility

Identify a location that is convenient to visit frequently. Returning to the same nature areas regularly provides children with a sense of familiarity and comfort. This can encourage them to explore and engage more actively with their environment. It will also allow them to witness the changes in the environment over time and learn about the plants and animals that inhabit the area.

Guidelines for the group

Keeping safe and well requires some rules. This may include for example: no picking anything growing or living, no tasting things, and to respect the plants, animals and people around them. You may also ask that children stop at a crossroads and wait for others in the group to gather before collectively deciding where to go. Visual guides, such as those in the images below, can be helpful for encouraging younger children to recap the rules before each walk.

Figure 64. Child-friendly visual guides.

Role of caregivers

The level of instruction provided by caregivers in nature play should be balanced. While providing guidance and safety instructions, they should avoid being overly prescriptive. The guiding question “Is the intervention worth the learning?” can be considered to help adults shape their responses to children in supporting the child’s self-directed learning. Should more adults be involved in running the programme, a pre- and post-discussion to reflect on the various interventions may be helpful to create a shared understanding of approaches within the team.

Interactivity

Engage children in the experience by making the nature walk interactive and hands-on. Encourage them to touch, smell and observe different plants, flowers and insects. Bring along magnifying glasses, binoculars or sketchbooks to enhance their exploration. Ask open-ended questions to stimulate their curiosity and encourage them to share their observations and thoughts. At times, providing children with a task such as an orienteering activity that they lead can also help direct their energies and try out new experiences within the environment.

Incorporate games and activities

Introduce games and activities that make the nature walk even more enjoyable and educational. Create a scavenger hunt where children search for specific items or natural features, such as birds, animal footprints or different types of leaves. Play “I Spy” using natural elements as clues or encourage them to collect small objects like rocks or feathers to create a nature-inspired collage later.

Respect nature

Instill a sense of respect and responsibility for the environment in children during the nature walk. Teach them the importance of not disturbing plants or animals, and explain the concept of “leave no trace” by ensuring they do not litter. Encourage them to appreciate the beauty and diversity of nature while emphasising the significance of conservation and sustainability.

Capture memories

Encourage children to take pictures of interesting plants, animals or landscapes. Later, you can review the photographs together, allowing them to share their experiences and observations. This not only helps preserve memories but also encourages further exploration and conversation about the natural world.

As each child is unique, you may adapt these tips to suit their age, interests and abilities. The goal is to create an enjoyable and enriching experience that fosters a positive connection with nature.

CASE STUDY
Exploring nature through the Garden Discovery Programme

Introduction

The Garden Discovery Programme at the Singapore Botanic Gardens provides children with a unique opportunity to connect with nature through recurring, interactive nature walks. Across weekly sessions, children are engaged in activities that foster curiosity, hands-on exploration and a deep appreciation for the natural world around them. Children are able to climb hills, spot animals, build forts and form friendships.

Objectives

The programme aims to:

- Encourage children to observe and engage with their natural surroundings.
- Foster a sense of community among participants.
- Develop problem-solving skills and imagination through unstructured play.

Key activities and observations during an observed programme session

1. Wildlife discovery and observation

Figure 65. Taking time to observe wildlife in the Gardens.

During a walk (Fig. 65), children spotted a large monitor lizard on a tree trunk, soon joined by two smaller lizards in the leaf litter. Exclaiming “It’s a family!”, the children watched in awe for 10 minutes, mesmerised by the lizards’ movements and the natural “dinosaur” appearance of the largest lizard. This fascination turned into a learning moment as the children observed the lizard’s long claws and scaly skin. Later, they were delighted to see a vibrant Crimson Sunbird flitting nearby.

2. Engaging in role play

Figure 66. Children using natural materials found around them for play.

Children were encouraged to choose their favourite branch from the leaf litter, which quickly became a tool for imaginative play (Fig. 66). Some used it to mimic arborists pruning trees, while others dug into the ground, scratching and exploring. The game then evolved into a lively session of “catch” as they continued along the red-brick path. The group also discovered the stump of an old tree, examining the hollow centre while learning about the stump’s role in preventing erosion.

3. Building community

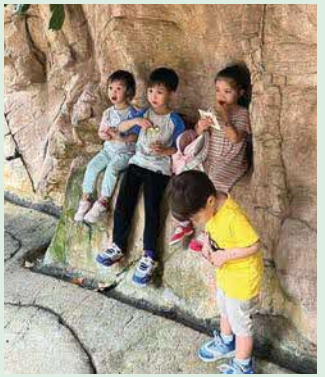


Figure 67. Playing, building friendships and problem-solving together are important parts of the experience.

Each session allowed children to rest, recharge and share snacks (Fig. 67). This gathering space became a foundation for friendship, with children engaging in playful banter and laughter. Over time, a sense of community blossomed, as they moved beyond their sibling pairs to bond with one another.

4. Weather-resilient play

Figure 68. Come prepared for weather changes so that play can continue regardless.

At the end of a humid walk, a sudden shower provided refreshing relief (Fig. 68). With raincoats on, the children embraced the weather with enthusiasm, demonstrating that with the right gear, nature play can be enjoyed in all conditions.

5. Imaginative play and interaction with nature

Figure 69. Creative play enables children to get familiar with nature and interact with the world around them.

A small box of animal figurines sparked creativity, as children created miniature wildlife habitats with rocks and other natural materials (Fig. 69). They balanced the animals on rock faces, narrating their movements and even assigning them voices, enhancing their interaction with the environment and each other.

6. Enhancing observational skills with tools

Figure 70. Learning to identify common birds and insects using guides.

Children used lightweight bird guides to identify local birds (Fig. 70). These visual resources proved valuable, sparking curiosity and facilitating identification while exploring the Gardens.

7. Building and shelter creation

Figure 71. Building and problem-solving using readily found natural materials.

A young participant used branches, leaves and bamboo to build a cozy den (Fig. 71). Lightweight materials allowed for independent construction, fostering problem-solving skills. These dens became communal spaces where children could hide and relax, leading one child to suggest building a playground in the next session.

8. Nature art: Creative expression

Figure 72. Artistic creations made from natural materials.

Encouraging children to slow down and appreciate natural materials, the programme invited them to collect items such as leaves and twigs, which they then arranged to create nature art on the ground.

Children's creations included faces, animals and abstract shapes, each reflecting their individual interpretations of the environment.

9. Indoor extensions

Materials collected on walks inspired a range of indoor activities, including collages, loose parts play and sorting by size. These hands-on activities introduced concepts like size comparison and categorisation, bridging outdoor exploration with classroom learning.

Figure 73. Children creatively using collected materials in an indoor setting.

Key takeaways and call to action

The Garden Discovery Programme demonstrates how nature play can create memorable experiences, foster curiosity and develop a connection with nature among children. By engaging with nature in varied and immersive ways, children learn to appreciate the environment and develop teamwork, problem-solving and imaginative play skills.

Call to action for teachers, parents and caregivers

Consider how you can incorporate similar nature play opportunities into your own routines. Encourage children to explore local green spaces, observe wildlife and use natural materials to play and create. Whether you are in a backyard, park or schoolyard, unstructured time in nature can offer rich learning experiences that go beyond the classroom. Let's nurture curiosity and wonder by providing children the freedom to connect with nature – rain or shine!

REFERENCES

1. Chee Wah, S., (2021). A natural way to grow: Exploring the potential of nature playgardens as sites for fostering children's wellbeing in Singapore's preschool education. Singapore University of Social Sciences. IRB approval number: APR-0120-V1.0-27042021

2. Office of the United Nations High Commissioner for Human Rights. (1989). The United Nations Convention on the Rights of the Child. General Assembly Resolution 44/25. Retrieved from https://www.unicef.org.uk/wp-content/uploads/2016/08/unicef-convention-rights-child-uncrc.pdf

3. Aziz, N. F., & Said, I. (2016). Outdoor environments as children's play spaces: Playground affordances. In *Play and Recreation, Health and Wellbeing, 9*, 87–108. https://doi.org/10.1007/978-981-4585-96-5_7-1

4. Carr, V., & Luken, E. (2014). Playscapes: a pedagogical paradigm for play and learning. *International Journal of Play, 3(2)*, 69–83

5. Louv, R. (2005). *Last child in the woods: Saving our children from Nature-Deficit Disorder.* Chapel Hill, NC: Algonquin Books.

6. Huttenmoser, M. (1995). Children and their living surroundings: Empirical investigations into the significance of living surroundings for the everyday life and development of children. *Children's Environments Quarterly, 4(12)*, 403–413.

7. Fjørtoft, I. (2004). Landscape as Playscape: The Effects of Natural Environments on Children's Play and Motor Development. *Children, Youth and Environments, 14(2)*, 21–44.

8. Ulset, V., Vitaro, F., Brendgen, M., Bekkhus, M., & Borge, A. I. H. (2017). Time spent outdoors during preschool: Links with children's cognitive and behavioral development. *Journal of Environmental Psychology, 52*, 69–80.

9. Bixler, R. D., Floyd, M. F., & Hammitt, W. E. (2002). Environmental socialization: Quantitative tests of the childhood play hypothesis, *Environment and Behavior, 34(6)*, 795–818.

10. Hanscom, A. J. (2016). *Balanced and Barefoot: How Unrestricted Outdoor Play Makes for Strong, Confident, and Capable Children.* New Harbinger Publications, Inc.

11. White, R., & Stoecklin, V. L. (2008). *Nurturing children's biophilia: Developmentally appropriate environmental education for young children.* White Hutchinson Leisure & Learning Group.

12. Fromm, E. (1973). The anatomy of human destructiveness. *New York: Holt, Rinehart, and Winston.* 366.

13. Wilson, E. O. (1984). *Biophilia.* Cambridge, MA: Harvard University Press.

14. Terrapin Bright Green. (2014). *14 patterns of biophilic design: Improving health and well-being in the built environment.* New York, NY: Terrapin Bright Green LLC.

15. Sutton-Smith, B. (2008). Play theory. *American Journal of Play, 1(1)*, 80–123.

16. Piaget, J. (2007). *The child's conception of the world: A 20th century classic of child psychology* (2nd ed.). Lanham, MD: Rowman & Littlefield.

17. Kytta, M. (2003). *Affordances and independent mobility in the assessment of environmental child friendliness.* (Doctoral of Philosophy dissertation). Helsinki, Finland: Helsinki University of Technology.

18. Campbell, H. (2013). *Landscape and Child Development, A Design Guide for Early Years- Kindergarten Play-Learning Environments.* Toronto School District Board and Evergreen.

19. Truong, M.V., Nakabayashi, M., & Hosaka, T. (2022). How to encourage parents to let children play in nature: Factors affecting parental perception of children's nature play. *Urban Forestry & Urban Greening.* https://doi.org/10.1016/j.ufug.2022.127497

20. Kaplan, S. (1979). Perception and landscape: Conception and misconceptions. In *Proceedings of our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource.* Incline Village, NV. 241–248.

21. Moore, R. C. (1996). Outdoor settings for playing and learning: Designing school grounds to meet the needs of the whole child and whole curriculum. *North American Montessori Teachers' Association Journal, 21(3)*, 97–121.

22. Ball, D., Gill, T., & Spiegal, B. (2012). *Managing risk in play provision: Implementation guide.* London: National Children's Bureau.

23. Bento, G., & Dias, G. (2017). The importance of outdoor play for young children's healthy development. *Porto Biomedical Journal, 2(5)*, 157–160.

24. National Recreation and Park Association. (2017). *Certified Playground Safety Inspector: Course Manual.* Ashburn, VA: National Recreation and Park Association.

25. Asia Insights. (2019). *Evaluation of biophilic park concept at the Nature Playgarden @ HortPark: Full report.* Asia Insights, Singapore Commissioned by the National Parks Board.

Jubilee Park at
Fort Canning Park

A publication of the
National Parks Board