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Guidelines for Planning Optimal Playgrounds in Preschools and Daycare Facilities

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Introduction

What is happening to today's children? They spend most of their time indoors, moving from one screen to another, and the closest they come to the outdoors and nature is the playground. These playgrounds, however, are often far from natural in appearance, full of artificial elements like synthetic grass and plastic structures. Studies have linked urban children's lack of access to nature to a variety of problems, including concentration and attention difficulties, social deficits, violent behavior, anxiety, depression, obesity and allergies.

This document describes a workshop, conducted over three days, the goal of which was to create the ideal playground for childcare facilities and preschools. It examined two elements that playgrounds currently lack - nature and play - based on the assumption that reintroducing these elements would improve the playground experience. Thus, even if children are not getting their required daily dose of nature and play at home, they will get them at daycare or in preschool.

Yad Binyamin Science Center: JI-think nature

Background

The preschool or daycare playground is currently one of the last places in which urban children can enjoy direct, unmediated access to nature. Urban life does not call for much access to nature, especially in the case of the child. Playing freely out of doors, which was once an integral part of children's daily routine, is now an almost nonexistent experience in the lives of Israeli families. Children spend more time watching television and playing computer games than they do playing outside.

In his book Last Child in the Woods, Richard Louv argues that the childhood experience of direct and spontaneous access to nature is growing increasingly rare. He refers to the possible results of this phenomenon as NDD - Nature Deficit Disorder, and calls attention to the significant developmental impact that this lack of contact can have on our children.

The advantages of connectedness to nature have been well documented in many academic studies and publications. These studies show that daily access to nature and opportunities for free play have a positive impact on children's physical[1], emotional and cognitive[2] health. Moreover, playing and exploring in nature have been shown to be a basic need for children, a part of their language and an important contributor to their intellectual[3], creative[4], emotional, social[5] and spiritual development.

1. Louv, R. (2005). *Last Child in the Woods*: Saving Our Children from Nature-Deficit Disorder. Chapel Hill, NC: Algonquin Books
2. "Grounds for movement: green school grounds as sites for promoting physical activity", J. E. Dyment, Health Education Research, Volume 23, Issue 6, 1 December 2008, Pages 952–962
3 AT HOME WITH NATURE Effects of "Greenness" on Children's Cognitive Functionin, Environment and behavior, Nov.2000
4 Playing with Nature: Supporting Preschoolers' Creativity in Natural Outdoor Classrooms, Christine Kiewra, Ellen Veselack, 2016
5 Effects of Outdoor Education Programs for Children in California, American Institutes for Research,2005

Most children currently spend many hours at daycare and educational facilities - sometimes eight to ten hours a day. For many of these children, these facilities are almost the only place in which they might be able to play freely outside and experience direct contact with nature. And yet, the outdoor areas in most facilities do not actually allow this in practice. Most of these areas are flat, largely covered by hard surfaces like paving stones, concrete, safety surfacing and synthetic, industrial playground equipment. As a result, many small children have very few opportunities to touch natural materials.

Playing is a primary aspect of children's lives – as necessary to their lives as eating, drinking or sleeping. Playing is not just a means of learning and expending energy, it is also the language through which children understand, learn about and experience their world. Today's playgrounds usually contain a very scant range of motoric forms of play, and this play is generally focused in a single area or around a small handful of individual structures. In most cases, standard playgrounds do not encourage children to use their senses, to create or to imagine. This means that many skills – emotional, linguistic, social etc. - are not being properly addressed by this standard playground. Playing in nature offers children the best of both worlds, allowing for more varied forms of play and the development of these neglected skills.[6]

6 Assessment of play spaces from the perspective of the child's development, Hebrew University's Urban Clinic, Bernard van Leer Foundation

The goal of this document

The purpose of this document is to provide guidelines for planning pedagogically and developmentally rich daycare and preschool playgrounds. It offers a new vision of what the daycare or preschool playground can be, suggesting a place that exposes children to a wide range of creative possibilities, challenges and experiences in a natural environment. The guidelines it suggests are designed to supplement the standard codes and guidelines required by law and by the relevant authorities.

The document focuses primarily on the physical aspect rather than the pedagogical one. It relies on research and on documents published by the Ministry of Education. Most prominently, it relies on "The Preschool – Environment, Inspiration and the Relationship between Them" (Ministry of Education, Pedagogical Office, Section A for Preschool Education), a booklet that covers all of the child's pedagogical needs. The document presented here will address the practical, planning aspects of the issue, namely how the idea of the natural playground can be put into practice. How might it be constructed? How might it serve children's pedagogical needs? What sorts of planning principles should guide us in this process?

Note: When implementing these guidelines, planners must exercise their own judgement to adapt the playground to the conditions of the given space, as well as the size and the physical and cognitive ability of the age group for which the playground is intended.

The document construction process

The document is based on a series of workshops that were conducted as part of "Urban95's Knowledge Network in Israel."[7] These workshops were attended by professionals from a number of different local authorities, representing the departments of Education, Preschool Education, Public Buildings, Architecture and Urban Planning. Also participating were representatives from the Ministry of Labor, Social Affairs and Social Services' Daycare department and from the "Beterem - Safe Kids Israel" organization, as well as the national supervisor of NA'AMAT. The first workshop was devoted to the topic of "nature," the second to the topic of "play," and the third to how "nature" and "play" could be combined to create a natural playground.

7 The program, "Urban95's Knowledge Network in Israel," led by the Hebrew University's Urban Clinic and supported by the Bernard van Leer Foundation, was designed to promote urban planning that is suited to the needs of young children. It is part of an international program which the Foundation is currently running in ten countries around the world, that offers professional knowledge, expertise and guidance in processes of creating and implementing urban planning for young children.

Workshop A – Nature: The Importance of Nature in Children's Lives

Throughout human history, people have been close to nature. They have lived in it, fed from it, used it for their various needs, and, most importantly, respected it and seen it as part of a broader fabric of existence, of which they themselves were a part. Today, however, we live in a time where children's opportunities to experience and connect emotionally with real natural spaces are growing fewer and farther between. There is concern that children's knowledge of nature will become entirely mediated by the camera lens, through nature documentaries or apocalyptic films about environmental collapse, to which children are exposed on an almost daily basis. If we do not raise our children to love and respect nature, and to understand humanity's place in it, we will not have a new generation of guardians to protect our home.

Biophilia is an innate human tendency to be a part of nature, which, even in the modern world, continues to be critical to our physical, mental and social wellbeing. As the illustration on page 13 shows, our species has spent the vast majority of the approximately 200,000 years since we first evolved living in a wholly rural environment, with the first cities arriving only 6000 years ago, and industrialization following even more recently, in the past 400 years.

In this workshop, we covered a wide range of research studies, which addressed the many significant ways in which human beings, and especially children, can be impacted by contact (or lack of contact) with nature. For example, we read Roger Ulrich's pioneering study on how looking at natural vistas influences patients' recovery.[8] We also read Daniel K. Brown's research on the positive impact of nature scenes on patients recovering from mental stress.[9] We read about

8 View through a window may influence recovery, Ulrich, Science, 224(4647), 1984

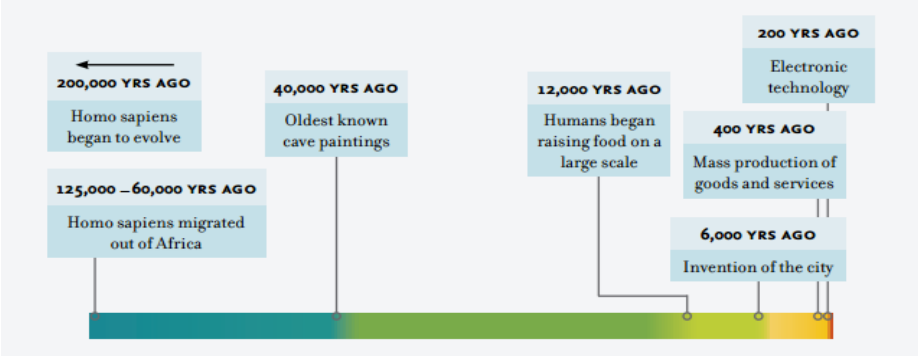
9 Viewing Nature Scenes Positively Affects Recovery of Autonomic Function Following Acute-Mental Stress, Daniel K, Brown, School of Biological Sciences, University of Essex, Colchester, 2013

nature's impact on children's immune systems, and about the importance of exposure to 'good' germs. We reviewed one study that showed the impact of living in "green" vs. "grey" places on children's cognitive functions,[10] and another that showed how nature can be used to reduce stress levels amongst urban children.[11] Finally, we reviewed the work of the Terrain Bright Green Project on Biophilic design.[12] Based on this survey, we gained a shared impression of how nature can and should influence the planning of the preschool playground space, which we translated into the series of "planning principles" described in the following pages.

10 Children's Cognitive Functions from , M.Wells Nancy ,2000

11 Nature buffering hypothesis, Jose A. Corraliza, Silvia Collado & Lisbeth Bethelmy

12 Biophilic Design: The Theory, Science and Practice of Bringing Buildings to Life, Terrapin Bright Green,Stephen R. Kellert, Elizabeth F. Calabrese, 2013



Keller& Calabrese, n.d

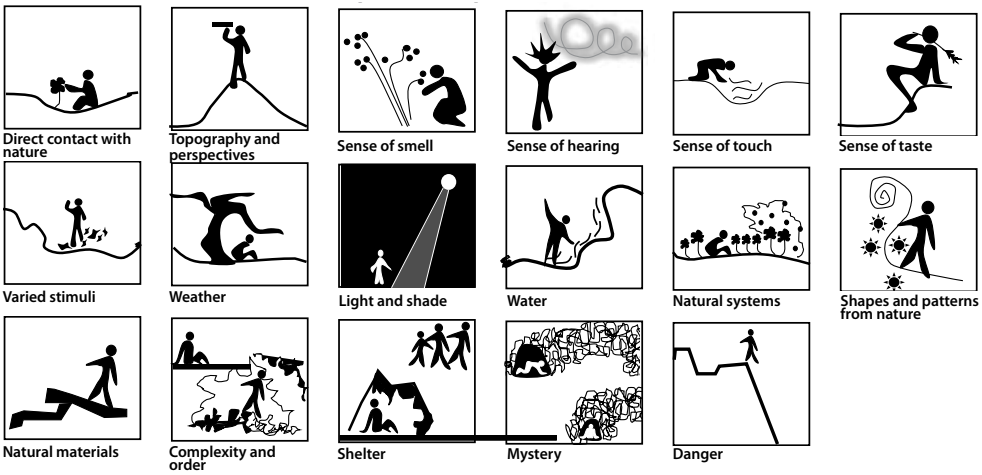
Exposure to nature is an everyday human need. The Nature Pyramid. Source: http://whattherapy.com/

Planning principles for integrating nature into preschool playgrounds

- **Direct contact with nature**: Children need to have daily contact with a natural environment – to see it and touch it. The playground should include natural spaces in which children can touch nature, experience nature, and look out at nature from within the preschool or daycare.
- **Topography and perspectives**: To learn and develop their spatial perception, children must occasionally climb to higher places and go down into lower ones. We should therefore try to create hills made of dirt, or of grass and vegetation, as well as areas with streams or ditches in which the children can spend time. The height and angle of the slope should be adapted to the children's age.
- **Varied stimuli**: The diversity of nature should be used to teach children about seasonality and change, and to encourage curiosity and a sense of wonder. This means using deciduous trees, plants that respond to the wind, plants that bloom and wither, vegetation that draws animal life, and surprising elements like fire, water and changing natural light.
- **The use of sensory elements**: The playground should contain elements that appeal to all of the child's senses like: plants, trees, rocks, water, various textures that appeal to the sense of touch, wind in the leaves, birdsong and running water to the sense of hearing, and even fruit and vegetables to appeal to the sense of taste.

- **A variable micro-climate**: The playground should include spaces with different temperatures – spaces that are sunny, bright and warm, and others that are shady, dark and cool.
- **Use of light and shade**: Trees and pergolas should be used to make variations in light and shade.
- **Use of water**: One of children's favorite pastimes is touching and playing with water. Water excites the senses and encourages inquiry and play through the sounds it makes, the way it looks, the surprising things it does, its temperature, its fluid texture etc. In the Israeli climate, introducing water as an element in the playground can significantly contribute to its quality.
- **Natural systems**: The use of flowering, fruit-bearing and deciduous plants will connect children to the cyclic nature of the world around them.
- **Natural shapes and patterns**: Using shapes and characteristics drawn from nature, such as spirals, repetitions, fractals, earth tones and various shades of green, in the playground and inside the kindergarten or daycare, can generate a pleasant, flowing atmosphere.
- **Use of natural materials**: The playground should be constructed using rocks, earth, sand, water, vegetation and wood. This will not only generate an environment that is pleasant and well suited for children, but will also encourage them to learn how all of these natural materials feel and change.

- **Complexity and order**: The playground should contain areas that are clear and orderly, and others that are more chaotic, so that children will be able to experience 'wild' nature as well as 'organized' nature.
- **Sheltered, private places**: It is important to provide children with a place to hide in, a place in which they can 'find themselves', enjoy privacy, or spend time with a small social group. This place does not have to be in the playground's periphery, but it must be a quiet place into which children can retreat.
- **Mystery**: Children like mystery; they seek it. The playground should be a place that is constantly rediscovered, continually generating interest.
- **Danger**: The natural playground is not free of obstacles. It should provide opportunities for calculated risk, places where children can test, challenge and train themselves, within a controlled and supervised space, in a variety of necessary life skills, such as balance, responsibility and self-confidence.



Principles for planning a biophilic landscape; Source: JI-Think Nature Landscape Architecture

Workshop B – Play: The importance of play in children's lives

Several years ago, a new article (no. 31) was added to UNICEF's Convention on the Rights of the Child, which specifically emphasized children's "right to relax and play."[13] Free play is one of the elements that are in danger of disappearing from modern children's lives. Play is gradually becoming more structured, more motivated and more competitive. The preschool and kindergarten years are a critical time in the development of children's imagination and creativity, which depends largely on how much time they are allowed to spend in free play.` Today, there are multiple elements that obstruct and interfere with children's free play: parental over- or under-involvement, lack of extensive, uninterrupted time for natural, unstructured play, the extensive dominance of computer games and digital media, the extreme emphasis in safety and accessibility, and time spent indoors rather than outside.

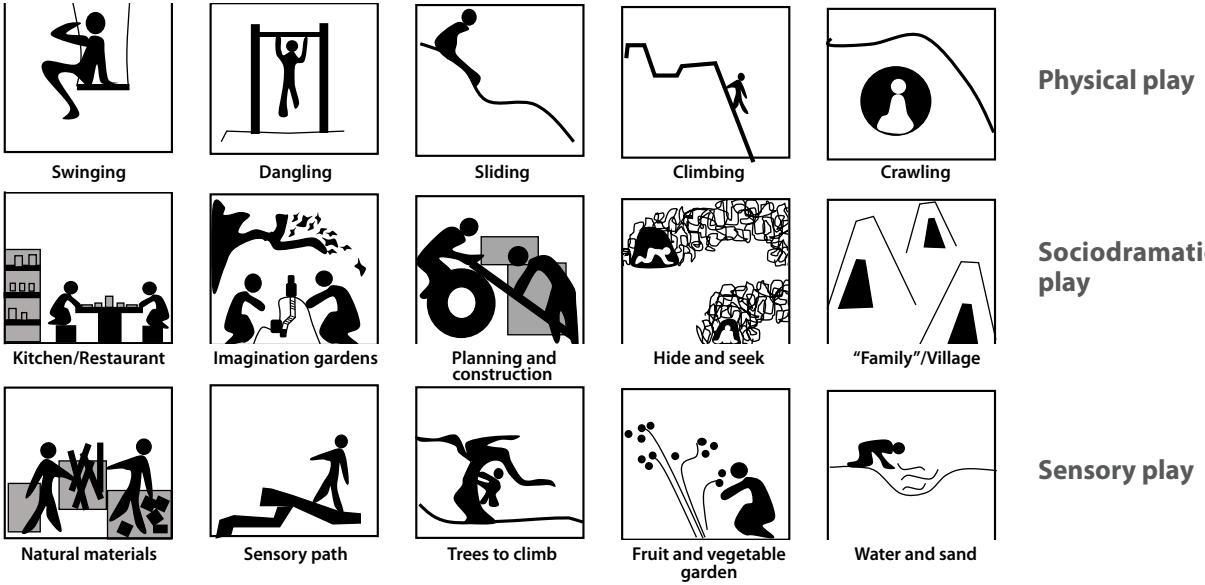
The world of play can be divided into three major types: physical play, socio-dramatic play and sensory play (see also the images on page 20). The playground should include at least two components from each of these groups.

- **Physical play**: Includes play that incorporates activities like swinging, dangling, sliding, climbing, crawling and balancing. These activities are partially present in today's standard playgrounds, but are not in themselves sufficient for child development. Moreover, their standard presentation is not sufficiently interesting to encourage children to return to them every day.

13 http://ipaworld.org/childs-right-to-play/uncrc-article-31/un-convention-on-the-rights-of-the-child-1/

- **Socio-dramatic play**: Includes playing at scenes from everyday life, like 'restaurant,' 'kitchen,' 'grocery store.' It also includes imaginary places like fairy villages, dinosaur gardens, trucking routes etc. Also in this category are age-appropriate games of planning and construction, using various freeform components, as well as hiding places, miniature houses, dollhouses, tents, and other places that can lend form to a make-believe story.

- **Sensory play**: This final type is often missing from modern preschool playgrounds. It includes the use of natural materials and textures, like a barefoot sensory path, trees to climb, leaves and dirt to walk on, fruit and vegetable gardens, and places to play in water and in sand. This latter element is becoming especially rare in preschools, despite the fact that it is one of the most important and beloved ones to children.



The principles of planning play in the playground / Source: JI-Think Nature Landscape Architecture

Workshop C: The natural playground

In the final workshop, we consolidated the principles that had been discussed in the previous two workshops, and presented the following integrated principles for planning natural playgrounds:

- **The biophilia principle**: The playground must be natural, different from the surrounding urban environment. It must introduce nature into the children's everyday environment. Today's playgrounds are often severely lacking in natural experiences. Even if they do contain a single tree or some bushes on their edges, their overall look is far from natural. The first principle is about the playground's general impression, which should be that of a natural space.
- **Health and sustainability**: The playground must be a healthy environment for the children. It should use only non-toxic materials (avoiding the use of materials like rubber or synthetic grass, plastic, aerosols etc.), and materials that boost the immune system (contact with earth, for instance, is important). Proper ventilation, access to both sunlight and shade, and the possibility of unobstructed, long-distance views are also important.

- **Play**: The preschool playground must contain multiple possibilities and types of play: an area for free physical play, and area for imaginary play, an area for sensory play, an area for physical challenge and fitness play, an area for intellectual play.
- **The child's perspective**: We as adults – in both our sense of scale and our perception of the play space – must, first and foremost, "get into the children's heads" and look at things from their physical and psychological perspective. Children are not "small adults." The playground should not only be adapted to the children's size, but must also be appealing, enjoyable and interesting to small children.
- **Flexibility, variability and evolution**: The playground must contain elements that can be moved, dismantled and changed according to the children's wishes. Areas must be set aside in which the paraphernalia for each day's play can be constructed, dismantled and reconstructed in new and different configurations. Boxes or containers with natural components can be a wonderful source of activity throughout the year – using leaves, flowers, fruit, branches, stumps etc.

- **Planning according to the "spirit of the place"**: The plan for the playground should reflect its surroundings and generate a sense of local identity. It should be rooted in its geographical, physical and socio-cultural context.
- **Generating challenges and opportunities for calculated risk**: The design of the playground should focus on developing various life-skills through play. Today, playgrounds are designed to avoid risk, but the playground should actually encourage a measure of calculated risk on the children's part. This can develop physical skills, personal responsibility, self-confidence and independence, as well as fostering feelings of success and achievement.
- **Socialization vs. solitude**: The playground should elicit activities that encourage teamwork, cooperation, social encounters, patience, delayed gratification, listening to others, and other elements that foster children's communication skills and their emotional and social development. At the same time, it should also provide a place for privacy, a place of rest to which children can retreat from the group and be in touch with their own private selves.

Areas in the playground – How should these look?

Ideally, the playground should contain eight different areas, each of which would address a different aspect of the playground experience.

- **The free physical play area**: Should include surfaces of varying heights - hills, tunnels, slides, ramps – on which children can run and climb, jump, etc.
- **The imagination and socio-dramatic play area**: Small spaces distributed throughout the playground can be focal points for role playing and imagination games. One or more structures that incorporate elements from daily life – a kitchen, tables, cookware, various other portable items etc.
- **A natural, seasonal focal point**: Areas of the playground should be habitats for flora and fauna. They should have soil, water, and various vegetation that attracts wildlife. There, children will be able to observe and learn about life cycles, change in nature, seasonality, various plant and animal species etc.
- **An area for physical challenges and fitness**: This includes structures or elements (e.g. parallel bars, chin-up bars, ladders etc.) designed to strengthen the body and provide a constant challenge for children to improve their capabilities.
- **An outdoor workshop**: A vegetable garden, woodshop, greenhouse, animal corner, or stage for performing – different areas for children to choose from, which can be either permanent or intermittently available in the playground. Each will require its own equipment, offering activities for pairs or small groups, with the appropriate guidance and supervision.
- **Outdoor learning in a group**: A space where all of the children can gather for a presentation, a group conversation or a lesson.
- **A quiet, private area**: A private place where one or two children can retreat from the group to rest or be by themselves. Several places in the playground should be set aside for that purpose.
- **Areas of continual change**: These should be flexible places that allow exploration, inquiry and experimentation. These areas can contain various materials for building – sand, water, components that can be dismantled and recombined, etc.
- **The linear axis** – a connecting pathway: The purpose of this is to move children from one corner of the playground to another and connect them all. The path should be clear, so the child can navigate easily through the space.

Examples of natural playground projects in preschools and daycare facilities

Natural playgrounds, in and out of educational facilities, have been an acknowledged phenomenon both in Israel and abroad for the past ten years. Such playgrounds do exist in Israel, but on a small scale. Playgrounds in the preschools of Kibbutzim and Moshavim were once natural, and even today many of these still have natural corners and vegetable gardens. The natural playground presented in this document, however, is different. The small, but growing, number of examples listed in the following is just the beginning.

Particular attention must be paid to the issue of daycare facilities (0-3) vs. preschools. Natural playgrounds for these ages do not exist in Israel. Daycares are not supervised by the Ministry of Education, but by the Ministry of Labor, Social Affairs and Social Services, which has yet to begin to change its perception and actions on this issue. One goal of this document is to address, for the first time, the need to change playgrounds for children aged 0-3, and how natural playgrounds can be adapted for the needs of this age group.

When examining examples from outside Israel, there are two important parameters to consider. First, though it may be more advanced, is the topic of natural playgrounds, which is still in its infancy abroad as well. Second, the participation of children aged 0-3 in preschool educational facilities can vary widely around the world. This can depend on variables like the length of maternity and paternity leave,[14] and on the age from which education in the country is free. In Israel and abroad, attendance levels rise significantly at age 3-6, so there are more natural playgrounds for ages 3-6 than there are in daycare facilities for younger children.

14 PF2.1: Key characteristics of parental leave systems http://www.oecd.org/els/family/database.htm

Examples from abroad

Turtle Rock Preschool

Irvine, California, USA

Planners: https://www.naturalplaygrounds.com

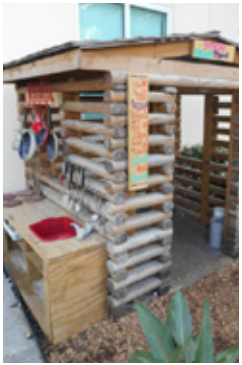
This preschool, which serves children between the ages of two months and six years, is located in one of California's most exclusive areas. The compound consists of 11 preschool classrooms and a total of over 250 children. It is surrounded by a large, natural playground, with flowers, gardens, trees, rocks, water, hills, valleys, a wooden climbing wall, a fort, a treehouse, a bridge, a wooden tunnel and a stone labyrinth.

Global Village Preschool

Miami, Florida, USA

Planners: Local

A preschool based in the Reggio Emilia approach. Located in one of Miami's wealthier districts, it houses approximately 50 children, and has a natural playground with a climbing hill, gardening areas, a slide, a wooden house etc.



Emmanuel at Brighton Childcare Centre

Waterloo, Ontario, Canada

Planners: http://www.earthscapeplay.com/

A preschool for children between 1.5 months and 5 years old. The playground is shaded by large trees, amongst which are distributed areas for imagination, music, an amphitheater, and a vegetable and flower garden. The playground also includes bridges and hills for climbing and sliding down, though the children claim that their favorite place is the water and sand area.




Little Learners EDEC

White Gum Valley, Australia

Planners: http://www.naturebasedplay.com.au

A Reggio Emilia approach preschool in Western Australia for children aged 0-5. Its natural playground is an integral part of its educational philosophy. At the staff's request, its design is as natural and organic as possible, simulating a 'real' natural environment. The playground includes water and mud, a balancing area, a music area, a tunnel, a cave, natural local vegetation, and even a place to build a campfire.

St. Hilda's ELC

Perth, Australia

Planners: http://www.naturebasedplay.com.au/

This preschool, for boys and girls aged 3-5, is part of a larger school for older girls. Its playground includes structures for climbing, holes and crevices, rocks, water and sand.

Examples in Israel

Ganei Zemer, Ra'anana, Lot 3004

Planners: JI-Think Nature Landscape Architecture

This project consists of three clusters of 3-5 preschools. Each preschool has a natural playground with multiple possible play activities: a grassy hill with a slide and a climbing feature, a sandy area with a chin-up bar, a wooden house and an external kitchen with table and chairs, a stream and bridge, and a garden with herbs and vegetables.

Ganei Zemer, Ra'anana, Lot 3006

Planners: JI-Think Nature Landscape Architecture

In addition to the stream, imagination areas and hills, this project also includes a shared meeting area. The entrance to the preschool cluster was turned into an outdoor theatre, in which children can sit around a small stage and watch lessons or plays. Adjacent there is also a sensory path, where children can remove their shoes and walk on a path made of multiple materials, and of paving stones with numbers on them. The area also has a small gate sized especially for children, allowing them to enter independently alongside the main entrance for adults.

Moshav Bazra Preschool Cluster

Planners: JI-Think Nature Landscape Architecture

This preschool cluster includes three preschools with an additional shared space between them, planned as a natural playground. There is no internal division in the space, resulting in a large and interesting compound that allows children, if they wish, to explore areas at some distance from their own preschool. Every preschool has a grassy climbing hill, with tree-trunks for climbing and a slide. Atop each hill is a wooden house with a kitchen and table. At the bottom of the hill is a tunnel that connects the paved area to the sandy area. Over the hill is a bridge, which connects the herb garden to the imagination area.

The shared space includes a stream with water activities and a pump, a wooden amphitheater, and a music area. There is also a large vegetable garden in the back designed for shared community gardening.

Science Enrichment Center, Yad Benyamin

Planners: JI-Think Nature Landscape Architecture

This center serves preschools from the entire region, offering activities that promote inquiry and learning. In addition to extensive and fascinating indoor activity, there is also a complementary natural inquiry playground. This playground includes an enormous hill with a variety of climbing options, and an viewing platform at the top. At the bottom is a tunnel and a nearby stream with a pump, which flows into a pool with fish. Near the stream is a sandy area with a wooden house, table and kitchen, and many opportunities for imaginative play. The entire compound is surrounded by a barefoot sensory path. Additional spaces have been set up around the site, including a construction area with materials to build and take apart, a mini carpentry workshop, a greenhouse and a vegetable garden. There is also a "road safety" paved area in which children drive toy cars and learn about traffic rules.

Summary and recommendations

This document was designed to spark the beginning of a process that will deal with the issue of planning natural playgrounds in preschools and daycare facilities, and to encourage debate about the kinds of changes that playgrounds must undergo and the needs of children of various ages. Our workshops showed that there is currently a great lack of nature in playgrounds, and in the planning of playgrounds that emphasize the two pillars of 'nature' and 'play'. Nevertheless, it must be acknowledged that processes of the type described here are beginning to take place here in Israel. Following a document produced by the Ministry of Education about playgrounds in educational institutions, and about the need to introduce natural playgrounds in this context, awareness has arisen to the fact that this need applies to preschools and daycare centers as well. Our document presents the basic principles of the natural playground, and how these can be incorporated into preschools and daycares. It is, however, only a preliminary overview of the topic.

We therefore recommend the following actions:

1. Writing a comprehensive document specifically targeted for young children, with detailed reference to the needs of infants, toddlers and preschool children. This document would contain specific planning for different age groups, including a survey of all the elements that the playground should contain, its size, its organization, and its adaptation to each specific age group. The document would be written with the cooperation, coordination, recommendations and guidance of the Ministry of Education and the Ministry of Labor, Social Affairs and Social Services.

2. Incorporation of the current document as an integral component in the planning and construction of playgrounds for preschools and daycare facilities. The document would serve as a tool for designing playgrounds that reflect the needs of children in these age groups.

3. Engaging in a dialog with the public. A process should be initiated to present the idea of the natural playground, and its various aspects, from the perspective of three relevant groups within the population: the professionals, the parents and the children. This process could reveal – to us and to all other parties – everyone's respective expectations, concerns and hopes for the new playground, as well as any problems that have arisen in playgrounds that have already been built.

4. Research – We recommend conducting a collateral research on the points above: The goal of this research is to collect and analyze qualitative and quantitative data reflecting the outcome of the daycare and kindergarten design. One study could, for example, examine the impact of the change on children 'before' and 'after' the changes were made in their outdoor environment. And another could examine and compare children in a standard yard to children in a natural playground yard.

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