

Betting on INNOVATION: Build Futures

November 19-22, 2019

Creating Schools Where Children & Youth Learn to Live with Each Other & Planet Earth

**Robin Moore, MCP, Professor of Landscape Architecture,
NC State University, Raleigh, North Carolina, USA**

CASCAIS





Nature play and learning every day!

naturalearning.org

MISSION

“Creating environments for healthy human development and a healthy biosphere for generations to come.”

Natural Learning Initiative **Activity Areas**

Creating environments for healthy human development and a healthy biosphere for generations to come

Design Assistance

Childcare/development centers, schools, museums, zoos, botanical gardens, nature centers, park & recreation systems, and residential neighborhoods –everyday places of children and families.

Action Research

NLI research and evaluation tools applied in pre-post

Professional Development

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coordination, research, preliminary site visits, site analysis, community presentations, stakeholder meetings, design workshops, design reviews, training, and post-occupancy evaluation.

Information Communication

NLI website online resources and technical assistance, including the Green Desk, best practice demonstration sites, InfoSheets, publications, and Spanish versions.

Starting in year zero

Biophilia

LOVING

UNDERSTANDING

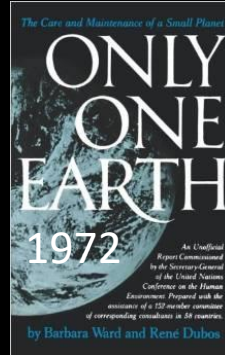
Planet Earth

Born
Curious

Creating

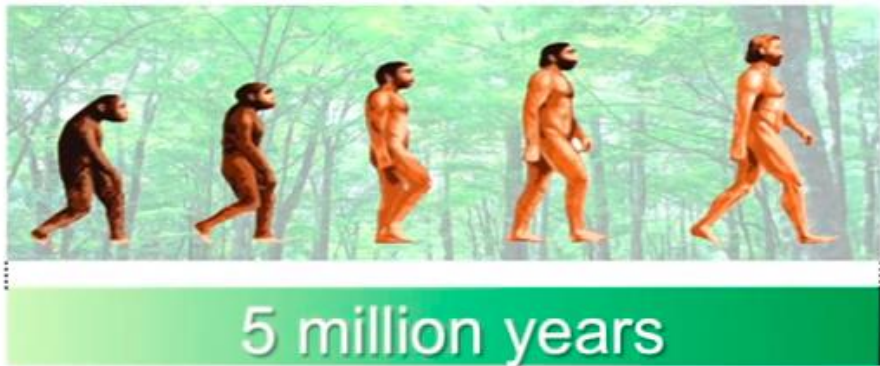
Sustainable Culture

Through childhood / youth engagement with nature



phylogeny / limits of adaptation?

Evolutionary time



99.9999%
in nature



0.0001%
in city

?
Digital
Age

Juliana v. United States

Juliana v. United States

COURT ORDERS AND
PLEADINGS
MEET THE JULIANA
PLAINTIFFS

MEET THE YOUTH PLAINTIFFS

Click on their portraits to learn more about en



Kelsey Juliana, 23
Eugene, Oregon



Levi D., 12
Satellite Beach, Flor



Isaac V., 17
Beaverton, Oregon



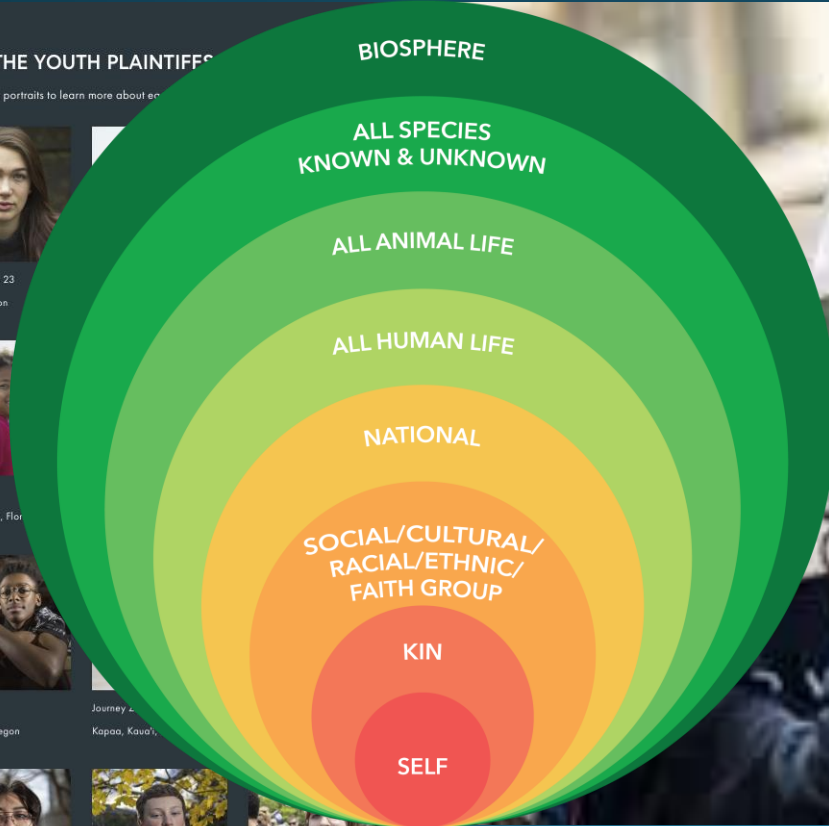
Jaime Butler, 18
Flagstaff, Arizona



Zealand B., 15
Eugene, Oregon



Jayden F., 15
Rayne, Louisiana



Research evidence

Green & blue are good for you!

- **Physical activity increased** (Sallis et al, 1993)
- **Attention functioning improved** (Faber Taylor et al, 2001; Grahn et al,
- **Executive functioning, self-regulation enhanced** (Kaplan & Ber
- **Cognitive abilities enhanced** (Wells, 2000)
- **Attention deficit symptoms reduced** (Kuo & Taylor, 2004)
- **Gross motor development supported** (Grahn et al, 1997)
- **Sickness reduced** (Grahn et al, 1997)
- **Richer play stimulated** (Boldemann, 2006)
- **Stress reduced** (Wells & Evans, 2003).
- **Smarter, healthier, happier kids result** (Burdette & Whitaker, 2005).
- **Environmental stewards as adults** (Chawla 2006).
- **Myopia risk reduced** (Rose et al 2008).



Environmental diversity, micro-organisms, asthma & allergies



“Hygiene Hypothesis”

Children who lived on farms had lower prevalence of asthma and allergies.

Children exposed to greater variety of environmental micro-organisms than children in reference group.

Markus J. Ege et.al, 2011

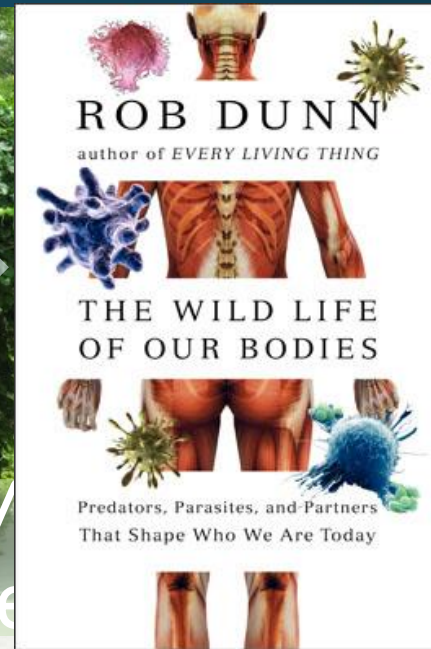
Environmental biodiversity = stronger immune system & allergic protection



Microbiota exposure



Native



ity!

Lehtimäki (2018) Skin microbiota and allergic symptoms associate with exposure to environmental microbes
Gensollen, et al (2016). How colonization by microbiota in early life shapes the immune system.
Ruokolainen, et al (2015). Green areas around homes reduce atopic sensitization in children.
Haahtela, et al (2013). The biodiversity hypothesis and allergic disease: World Allergy Organization position statement.
Ilkka Hanskia et al. 2012

Environmental diversity & brain development



Neuroscience shows that interaction with the environment improves the structure, chemistry, and function of the brain.

Dr. Mark Rosenzweig, UC, Berkeley

Ensuring sensory richness indoors/outdoors

Brain Cells

- Fruit fly 100,000 cells
- Mouse 5 million cells
- Monkey 10 billion cells
- HUMAN 100 billion cells

Millions of brain cell connections on a pinhead

- Newborn child M 253
- Eight-month-old M 572
- Twelve-year-old M 354

<http://developingchild.harvard.edu/science/key-concepts/brain-architecture/>

Brain Architecture The brain's ability to change in response to experience



Center on the Developing Child HARVARD UNIVERSITY

It is easier and less costly to form strong brain connections early in life, when the brain is developing most rapidly, than later.

WHAT IS EPIGENETICS?

AND HOW DOES IT RELATE TO CHILD DEVELOPMENT?

"Epigenetics" is an emerging area of scientific research that shows how environmental influences—children's experiences—actually affect the expression of their genes.

During development, the DNA that makes up our genes accumulates chemical marks that determine how much or little of the genes is expressed. This collection of chemical marks is known as the "epigenome." The different experiences children have rearrange those chemical marks. This explains why genetically identical twins can exhibit different behaviors, skills, health, and achievement.

This means the old idea that genes are "set in stone" has been disproven. Nature vs. Nurture is no longer a debate. It's nearly always both!

EPIGENETICS EXPLAINS HOW EARLY EXPERIENCES CAN HAVE LIFELONG IMPACTS.

The genes children inherit from their biological parents provide information that guides their development. For example, how tall they could eventually become or the kind of temperament they could have.

When experiences, during development, rearrange the epigenetic marks that govern gene expression, they can change whether and how genes release the information they carry.

Thus, the epigenome can be affected by positive experiences, such as supportive relationships and opportunities for learning...

...or negative influences, such as environmental toxins or stressful life circumstances ...

...which leave a unique epigenetic "signature" on the genes. These signatures can be temporary or permanent and both types affect how easily the genes are switched on or off. Recent research demonstrates that there may be ways to reverse certain negative changes and restore healthy functioning. But the very best strategy is to support responsive relationships and reduce stress to build strong brains from the beginning.

YOUNG BRAINS ARE PARTICULARLY SENSITIVE TO EPIGENETIC CHANGES.

Experiences very early in life, when the brain is developing most rapidly, cause epigenetic adaptations that influence whether, when, and how genes release their instructions for building future capacity for health, skills, and resilience. That's why it's crucial to provide supportive and nurturing experiences for young children in the earliest years.

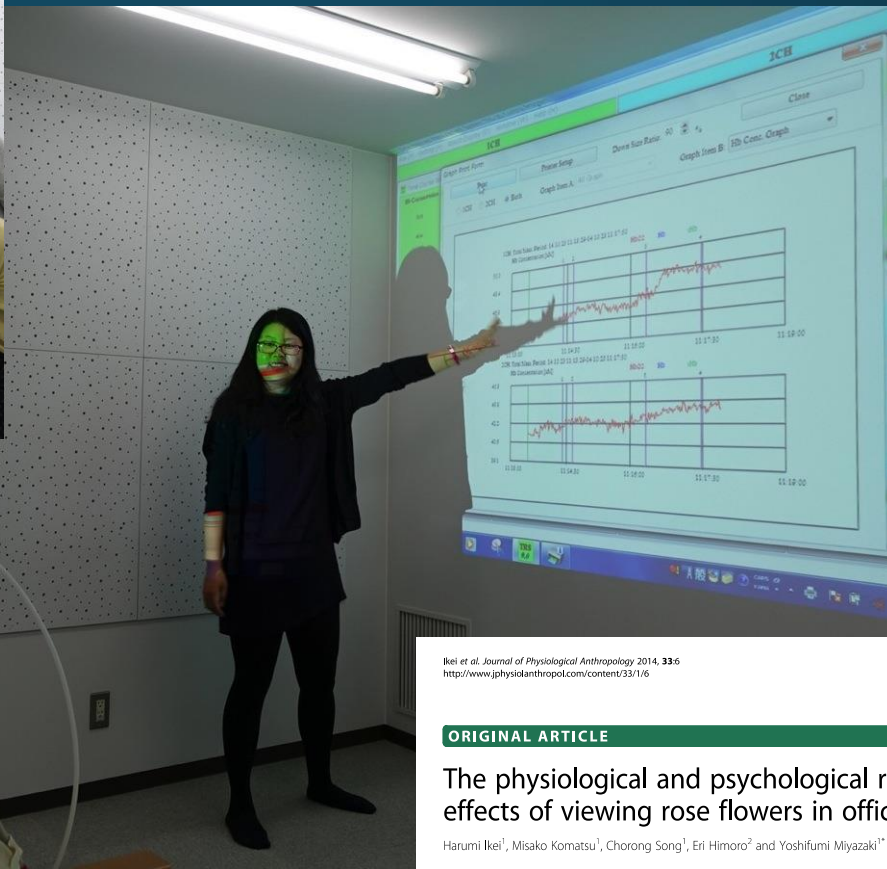
Services such as high-quality health care for all pregnant women, infants, and toddlers, as well as support for new parents and caregivers can—quite literally—affect the chemistry around children's genes. Supportive relationships and rich learning experiences generate positive epigenetic signatures that activate genetic potential.



Center on the Developing Child
HARVARD UNIVERSITY

Center on the Developing Child HARVARD UNIVERSITY
For more information: <http://developingchild.harvard.edu/science>

Miyazaki Lab, Chiba University, Japan



Ikei et al. *Journal of Physiological Anthropology* 2014, **33**:6
<http://www.jphysanthropol.com/content/33/1/6>



ORIGINAL ARTICLE

Open Access

The physiological and psychological relaxing effects of viewing rose flowers in office workers

Harumi Ikei¹, Misako Komatsu¹, Chorong Song¹, Eri Himoro² and Yoshifumi Miyazaki^{1*}

Nature-Based Solutions (NBS)

“Enhancing sustainable urbanisation ... can stimulate economic growth as well as improving the environment, making cities more attractive, and **enhancing human well-being.**”

(Nesshöver et al., 2017)

Carsten Nesshöver, Timo Assmuth, Katherine N. Irvine, Graciela M. Rusch, Kerry A. Waylen, Ben Delbaere, Dagmar Haase, Lawrence Jones-Walters, Hans Keune, Eszter Kovacs, Kinga Krauze, Mart Külvik, Freddy Rey, Jiska van Dijk, Odd Inge Vistad, Mark E. Wilkinson, Heidi Wittmer. 2017

Science of the Total Environment 579 (2017) 1215–1227



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The science, policy and practice of nature-based solutions: An interdisciplinary perspective



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^m INBO & Belgian Biodiversity Platform & University of Antwerp, Kliniekstraat 25, 1070 Brussels, Belgium

ⁿ Szent István University, Institute of Nature Conservation and Landscape Management, Péter K. u. 1., H-2100 Gödöllő, Hungary

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^p European Regional Centre for Ecohydrology of the Polish Academy of Sciences, Tylina 3, 90-364 Łódź, Poland

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^r Univ. Grenoble Alpes, Irstea, UR EMGR, 2 rue de la Papeterie, BP 76, 38402 Saint-Martin-d'Hères, France

HIGHLIGHTS

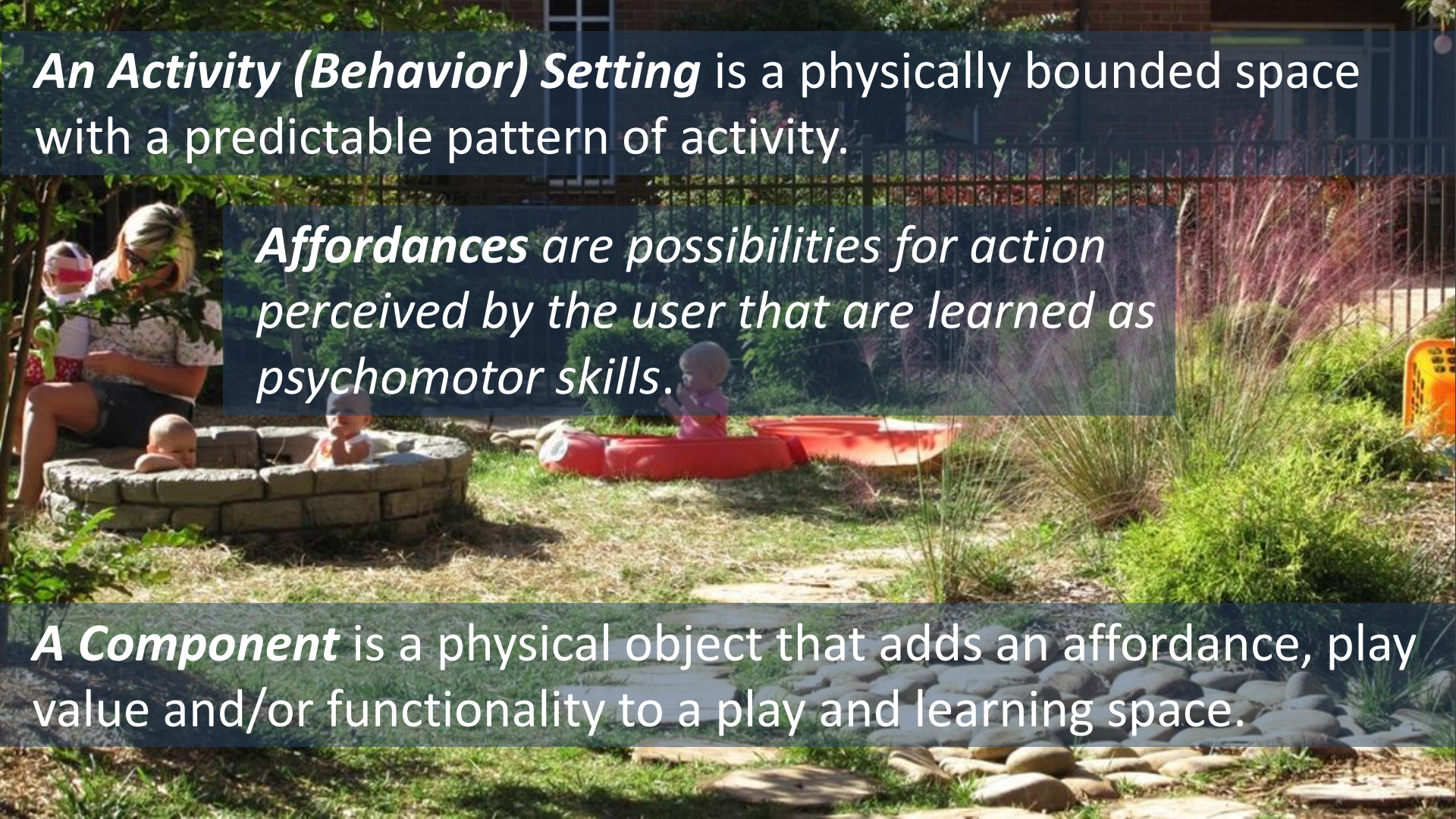
- Nature-Based Solutions (NBS) is a new term in environmental research and management.
- NBS has connections to other concepts for managing and understanding ecosystems.
- Existing experiences provide crucial insights on potential and pitfalls of NBS.
- The multiple dimensions of sustainability provide a framework to plan and assess NBS.
- NBS holds a potential for both stimulating and preventing economic developments.

Environmental Quality = Experiential quality



Friendly Ave. Christian School, Greensboro, NC



A woman with blonde hair is sitting on the left, holding a baby. Two other children are sitting in a circular stone fire pit. In the background, a child is sitting in a red plastic kayak. The garden has various plants, including tall grasses and a pink flowering shrub. A yellow caution sign is visible on the right. The scene is set in a sunny outdoor environment with a brick wall and trees in the background.

An Activity (Behavior) Setting is a physically bounded space with a predictable pattern of activity.

Affordances are possibilities for action perceived by the user that are learned as psychomotor skills.

A Component is a physical object that adds an affordance, play value and/or functionality to a play and learning space.



Infants and Toddlers: Hope for the Future



My Rights = Your Rights

Learn about child rights.

I have the right to be protected from abuse and harm; and I should show care for others and not bully other children.



I have the right to a clean and safe environment; and I should find ways to keep my own surroundings clean and safe.



I have the right to good health care; and I can keep myself healthy by taking care of myself when I am old enough.



I have the right to freedom of religion and thought; and I must respect the religions and thoughts of other people.



I have the right to be cared for and respected; and I must respect others and show care for them.



I have the right to be taken seriously and share my views and ideas. I must also listen to others and respect their views and ideas.



I have the right to healthy and enough food; and I should try to eat healthy food and not waste food.



I have the right to special care and support when I need it; and should use every chance to be the best person I can be.



I have the right to play, have fun, do sport and relax; and I should include everybody in my activities and games.



I have the right to try new things and make mistakes; and should learn from my mistakes and not repeat them.



I have the right to a good quality education; and I have to learn, do my homework, read and take part in the classroom.



I have the right to play, have fun, do sport and relax; and I should include everybody in my activities and games.



On this poster you learn about some of your rights. There are many more rights that you have as a child. Visit the following websites to see what the Convention on the Rights of the Child tell you about your rights:

<http://www.ohchr.org/EN/ProfessionalInterest/Pages/CRC.aspx>
http://www.unicef.org/southafrica/SAF_resources_crcchildfriendly.pdf
<http://www.un.org/cyberschoolbus/treaties/child.asp>

unicef 
 unite for children

Text: André Viviers and Mari Payne (UNICEF) Illustrations: Sandy Lightley (sandy@theartdept.co.za) through Sparx Media (www.illustrators.co.za) Concept on Rights

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unicef 
 unite for children

unicef 
for every child



THE CONVENTION ON
THE RIGHTS OF THE CHILD

Illustrated version by artists from Latin America and the Caribbean

Celebrating 30 YEARS of the Convention on the Rights of the Child

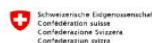
18, 19 and 20 november 2019
Palais des Nations (UN), Geneva, Switzerland

*Célébration des 30 ans
de la Convention
des Droits de l'Enfant*

les 18, 19 et 20 novembre 2019
Palais des Nations (ONU), Genève

More information and detailed programme at www.childrightshub.org

Plus d'information et programme détaillé sur www.childrightshub.org







SUSTAINABLE DEVELOPMENT GOALS

Making cities safer, healthier, greener, and friendlier for children

1 NO POVERTY



2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING



4 QUALITY EDUCATION



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



7 AFFORDABLE AND CLEAN ENERGY



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



10 REDUCED INEQUALITIES



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



14 LIFE BELOW WATER



15 LIFE ON LAND



16 PEACE, JUSTICE AND STRONG INSTITUTIONS

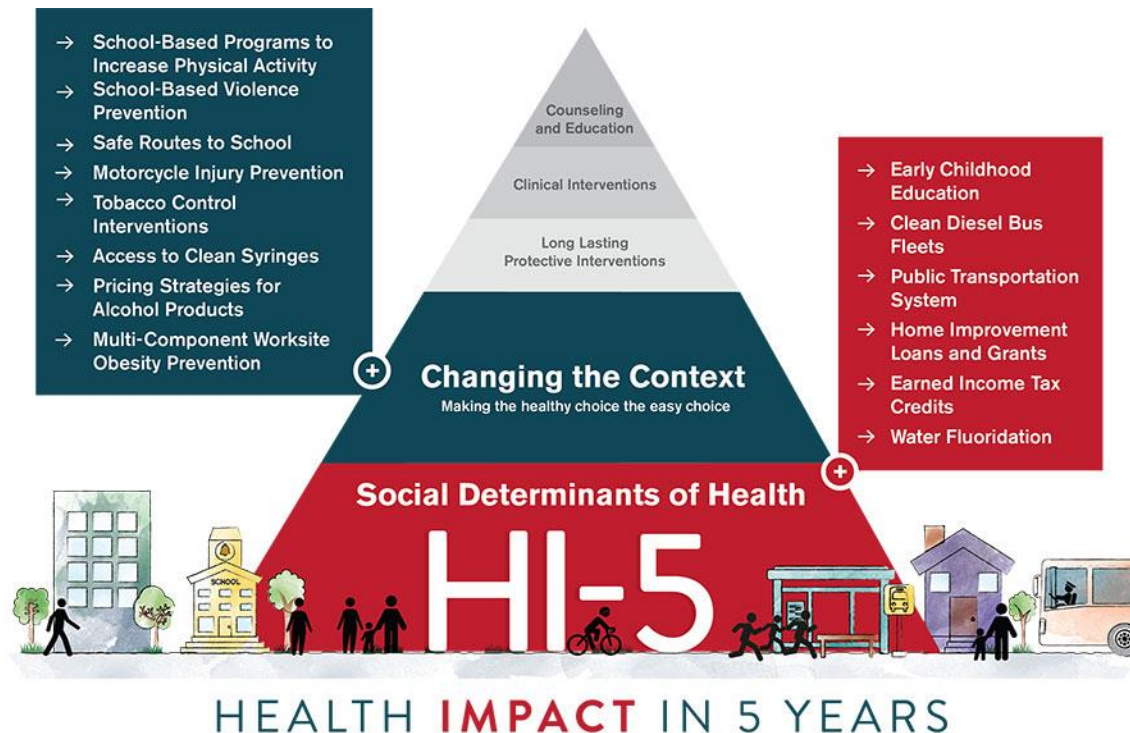


17 PARTNERSHIPS FOR THE GOALS



SUSTAINABLE
DEVELOPMENT
GOALS

Social Determinants of Health (WHO)



SUSTAINABLE CULTURE:

Integrating CRC, SDG, & SDH



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Conve

“By 2030, provide universal access to safe, inclusive and accessible, **green and public spaces**, particularly for women and **children**, older persons and persons with disabilities”
(Target 11.7).



BUILDING CHILD FRIENDLY CITIES A Framework for Action

For every child
Health, Education, Equality, Protection
ADVANCE HUMANITY

unicef 

ne
Child

DECLARATION OF THE CHILDHOOD

BY THE CHILDREN OF CASCAIS

CASCAIS



- > A city for all.
- > A united city.
- > For me it is a city with peace, freedom and that teaches us.
- > Is a city with respect.
- > Is a cheerful town because people are friendly and supportive and help to overcome difficulties and problems.
- > It is a city that knows how to teach others.
- > Give value to people.



- > All people are special.
- > Feel comfortable and happy.
- > For me it is to have freedom, to belong to everything and to have fun and play and games.
- > Everyone can stay here, for example, an english person, an spanish or chinese person.
- > Belongs to the city is: "freedom and respect".
- > Have a family.
- > Have a home.
- > It means play with others.
- > The animals of this city are all well treated, fed and never beaten or abandoned.
- > In this city we love nature and so we respect the environment.
- > It is knowing how to help others when they need it.

WHAT DOES IT MEAN
BELONGS TO
THE CITY?



- > Where they like us as we are.
- > There are fun mistakes.
- > Be attentive to everyone.
- > There are artists.
- > People ride bikes in the city.
- > It's having home, friends and a boat to travel.
- > It means sowing seeds through the city.
- > Share our things more with the neighbors. Give our best to help.
- > Let's all live in a big house instead of every family in your house.
- > Live in a joyful place, where you love and where we offer and learn.
- > Is to live happy for ever.
- > Have beautiful people inside, people with more values.
- > There is magic and we can create friends. There is no one without friends. In a world without friendship we were all sad.
- > Live in peace, without confusion. The bad became good and there was no war like



- > It's a city that contributed to all work together.
- > For me, living in the educating city would be great to play alone without tears and see all people happy ... It would be so good that I can't even explain.
- > It's like a string because my mom raises me and I will educate my friends and they will educate other friends.
- > It is a city where all come together to get what they want (...) taking advantage of what each has to offer and share.

- In Syria
- > Have a city in solidarity with the family, with the refugees, with the elderly, who share smiles and hugs.
- > It is being able to be free, curious and is to learn more about your city, is to belong to a family.
- > Challenge and be challenged to be a better person every day.
- > Live it, feel it, be part of it!
- > Collaborate so that everything works well for everyone and everything.
- > Respect the differences of everyone from the youngest to the oldest.
- > Learn in the city, with the city and with the people.
- > It is freedom. For example: learning to go shopping, have a life of freedom and never end our will.
- > Respect the disabled and help them.
- > Have a city to care for and have a city that takes care of us.
- > We want a safer and happier city, we want to have lots of friends, not be afraid to trust others.
- > It means that the city is also ours, we must be able to build things that interest us and not accept what we do not want.
- > Recognize our mistakes and try not to repeat.
- > It's walking free.
- > Be one among thousands. It is to be welcomed and welcome to others.
- > It is to have something inside us that makes us different and makes the city grow.
- > Have work, commitment, respect and much joy.
- > It also means like of what you do and what you see.

- > It is an evolved city because all citizens collaborate with each other.
- > It is a city where the old people are not sad and alone because every day the children will talk to them.
- > The old people could also teach children because they already know many things and could even be teachers' assistants.
- > The animals were not left on the street, they were taken to different kennels, which had no walls but rather glasses so that the animals could be watching the street and

- > Belongs to a city means having a good life.
- > It is to be able to give our opinion and not be left out. It is to be heard. It's having a place to be, where I can choose what I want to be.
- > It's have the opportunity to grow and be something more than ourselves. It is knowing how to live this city.
- > It's people being inspired.
- > Identify yourself with your environment, the routine and values of those who inhabit it.
- > For me to belong to the city is very good, because I help the city.
- > To be born there, to live there, to make friends and to grow with the city.
- > The city where I live helps me learn new legends and stories.
- > For me to belong to the city is to be happy, to live nested in a place like this.
- > It is sharing with other people everything the site offers.
- > It's about being happy and playing together.
- > It's a place where we can see the view.
- > It is good to belong to a place that I have always liked and will always live here.
- > It is living with a lot of people and being able to learn from them.
- > It's fun to be with so many foreign people.
- > I like to live in a village where I feel good and where everyone says, "good morning".
- > Traffic signs educate my mother to better guide and educate other people as well.
- > Belonging to an educating city is knowing how to be happy, seizing time rather than wasting it.
- > Sometimes other people say that we are not from here, but in fact, we belong to the city. Participate actively in its evolution, know its history, depend your present and worry about the future.

THE CHILD'S OPINION



CRC Article 12

“The child has the right to express his or her opinion freely and to have that opinion taken into account in any matter or procedure affecting the child.”

FREEDOM OF EXPRESSION



CRC Article 13

“The child has the right to express his or her views, obtain information, make ideas or information known, regardless of frontiers.”

**Child's drawing of Boca-Barracas
Buenos Aires**

FREEDOM OF THOUGHT, CONSCIENCE AND RELIGION



CRC Article 14

“The State shall respect the child’s right to freedom of thought, conscience and religion, subject to appropriate parental guidance.”

Place as a Person — Personscape ©
Neighborhood as Childhood Habitat Workshop
Buenos Aires

Child-led urban safaris (building rapport — sometimes with parents tagging along)



Research and data collection



Interviewing peers



Interviewing adults

Child-taken photographs



AIMS OF EDUCATION



Investigating of potential building site
Neighborhood as Childhood Habitat Workshop
Buenos Aires

CRC Article 29

“Education shall aim at developing the child’s personality, talents and mental and physical abilities to the fullest extent. Education shall prepare the child for an active adult life in a free society and foster respect for the child’s parents, his or her own cultural identity, language and values, and for the cultural background and values of others.”

Identifying problems, finding solutions



GUIC follows participatory principles, facilitating children to express their perspectives, to identify environmental problems, propose solutions, and communicate recommendations for application in urban design and planning policy.

Plaza Design: Neighborhood as Childhood Habitat Workshop
Buenos Aires

Creating an exhibition: My Neighborhood is Like That!



CHAPTER TWO

Our Neighbourhood is Like That!

Cultural Richness and Childhood Identity in
Boca-Baraccas, Buenos Aires

Nilda Cosco and Robin Moore

Young people in Boca-Barracas, the historic port district of Buenos Aires, described their lives and neighbourhoods through a variety of Growing Up in Cities methods. They revealed the 'paradoxical poverty' of an area of low material resources that is nevertheless rich in settings where its young people can play a vital role in the social and cultural life of their community. A community action programme was created based on the children's insights and priorities, which has inspired reflection on issues of governance related to the rights of children in the urban environment, as well as a discus-

Community-Based Design Process



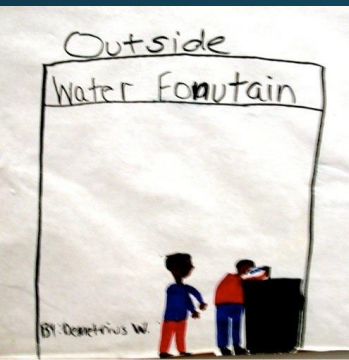
Community-Based Design Process



Heritage Park Residential Community

Engaging children in community commons design

Raleigh North Carolina, USA

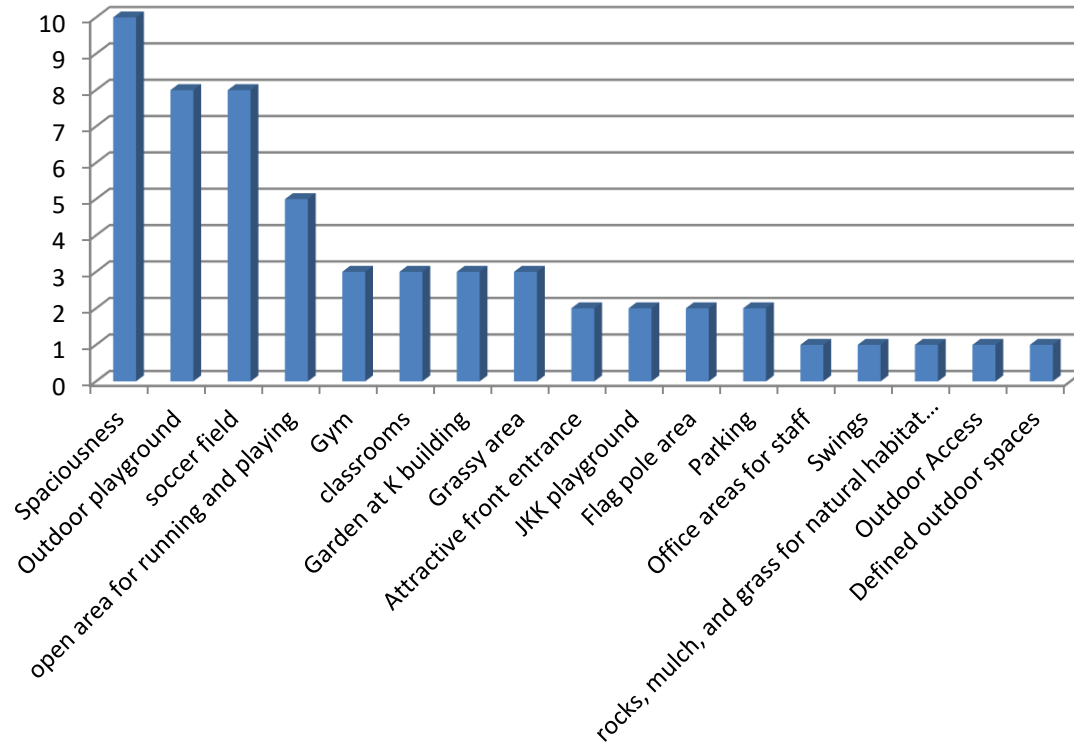


ADOLESCENCE: 13 -17 years (CRC) + 18 & 19



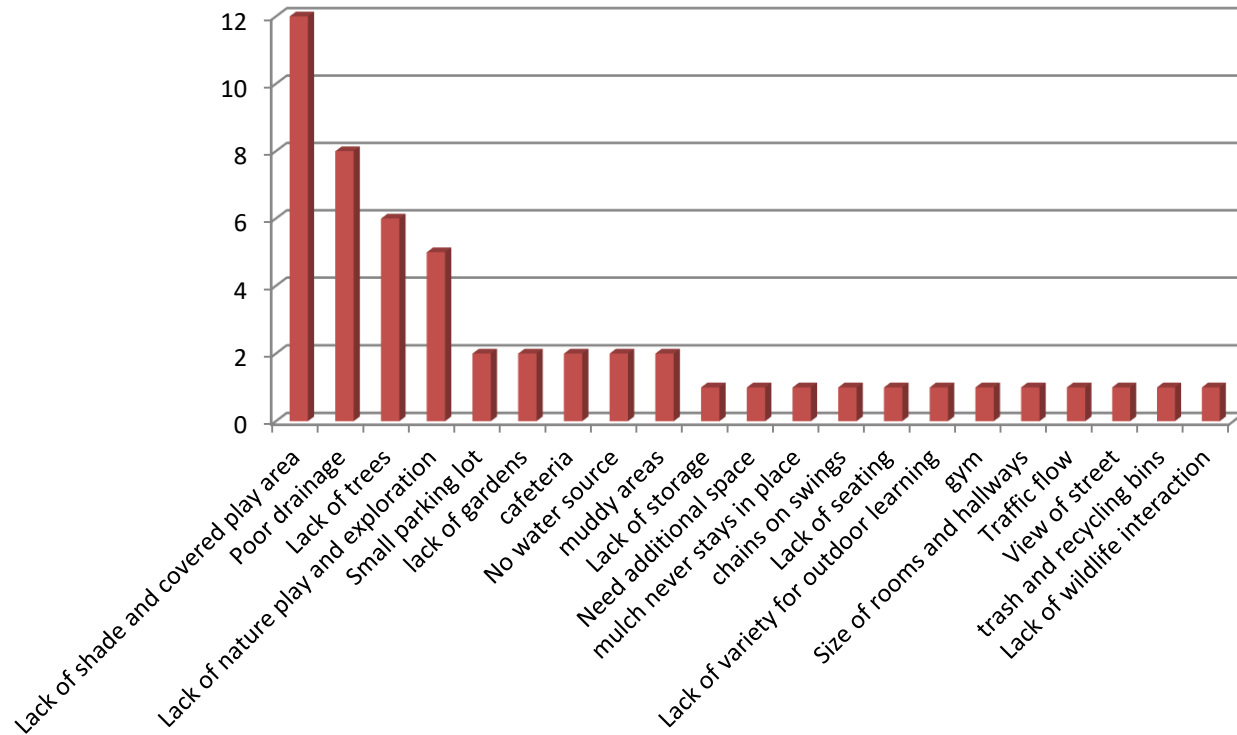
TEACHERS: EXISTING CONDITIONS

Please share up to five aspects of the existing School Grounds that you like:



TEACHERS: EXISTING CONDITIONS

Please share up to five aspects of the existing School Grounds that you do not like:



Strawberry Fields

The Outdoor Learning Center at Seth Boyden School



Design Program



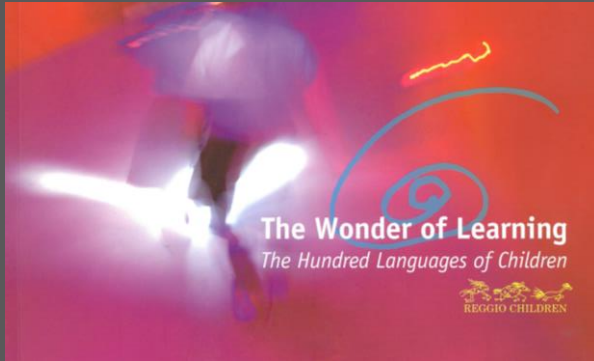
December 2001



Urban Childhood Habitat Infrastructure

1. Residential areas
2. Childcare / child development centers
3. Schools (public & independent)
4. Nonformal education institutions:
 - Children's gardens
 - Museums/children's museums
 - Zoos
 - Nature centers/botanical gardens/arboreta
5. Urban parks / playgrounds, green infrastructure
6. Pathway networks: Sidewalks, bikeways, green streets, greenways, urban trails

Reggio Emilia – city as expressive learning place



Play in the streets

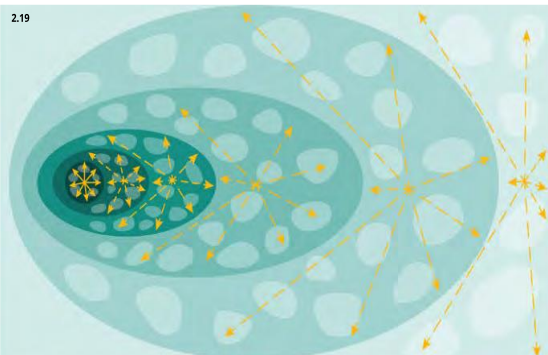
Playwork (Brinconauta) comes to Cascais & Lisbon



Little monkey jumps out of the box/Macaquinho Salta da Caixa

Nature relations – infancy to adolescence

2.19



Territorial Expansion with Age

Infancy

Sensory exposure to the wonders of nature.

(*Birth–18 months*)*

- Intimate, small-scale, multi-sensory surroundings.
- Ground level exploration of diverse surfaces and objects.
- Sitting, crawling, learning to walk, exercising body control.
- Uneven ground surfaces challenging.
- Overhead objects stimulate eye exercise.
- Reaching to objects.
- Listening, imitating natural sounds.

Toddlerhood

Differentiating natural objects and phenomena.

(*18–36 months*)*

- Expanding territorial scale.
- Additional motor skills: run, jump, balance, pedal.
- Ground level activity still important.
- Hands-on sensory exploration/ experimentation.
- Observing, following small creatures, insects, birds.
- Naming objects, plants, animals, weather.
- Learning where food comes from.
- Parallel play changes to small group interaction.

Primary School

Discovering and understanding the great outdoors.

(*3–7 years*)*

- Greatly expanded territorial scale.
- Spatial limits negotiated with adults.
- Motor skills extend movement complexity.
- Risk-taking, daring.
- Social, cooperative play, shared experience.
- Discover, understand cycles of life, seasons.
- Gardening.
- Enjoy children's nature literature.
- Cultural expression of nature in music, drama.

Middle Childhood

The halcyon days of childhood in nature.

(*8–11 years*)*

- Territorial scale highly variable.
- Can navigate residential neighborhood and beyond.
- Bicycle riding, skating, sledding, climbing, etc.
- Interest in collecting and classifying natural objects.
- Want to feel useful.
- Construction skills.
- Motivated by hands-on, ambitious STEAM projects.
- Creativity, imagination through nature.

Adolescence

Nature as a vehicle for personal development.

(*12–17 years*)*

- Nature as a place for social interaction.
- Individual talents nurtured by nature.
- Emotional expression through nature.
- Engaged by environmental/ conservation issues.
- Leadership skills emerge.
- Facilitate activities of younger groups.

Infancy

Sensory exposure to the wonders of nature.

*(Birth–18 months)**

- Intimate, small-scale, multi-sensory surroundings.
- Ground level exploration of diverse surfaces and objects.
- Sitting, crawling, learning to walk, exercising body control.
- Uneven ground surfaces challenging.
- Overhead objects stimulate eye exercise.
- Reaching to objects.
- Listening, imitating natural sounds.

Toddlerhood

Differentiating natural objects and phenomena.

*(18–36 months)**

- Expanding territorial scale.
- Additional motor skills: run, jump, balance, pedal.
- Ground level activity still important.
- Hands-on sensory exploration/ experimentation.
- Observing, following small creatures, insects, birds.
- Naming objects, plants, animals, weather.
- Learning where food comes from.
- Parallel play changes to small group interaction.

Primary School

Discovering and understanding the great outdoors.

*(3–7 years)**

- Greatly expanded territorial scale.
- Spatial limits negotiated with adults.
- Motor skills extend movement complexity.
- Risk-taking, daring.
- Social, cooperative play, shared experience.
- Discover, understand cycles of life, seasons.
- Gardening.
- Enjoy children's nature literature.
- Cultural expression of nature in music, drama.

Middle Childhood

The halcyon days of childhood in nature.

*(8–11 years)**

- Territorial scale highly variable.
- Can navigate residential neighborhood and beyond.
- Bicycle riding, skating, sledding, climbing, etc.
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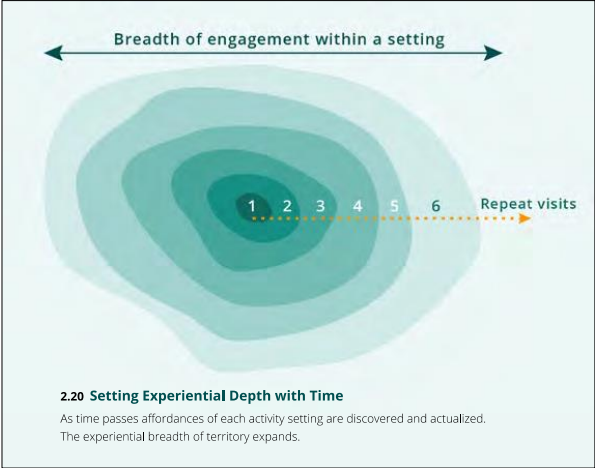
Adolescence

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Deep, memorable relations through repeated hands-on experiences



Urban Green Space and Health: Intervention Impacts and Effectiveness

Report of a meeting
Bonn, Germany

20–21 September 2016



**SOCIAL-EMOTIONAL EMPATHY WITH
EACH OTHER & THE REST OF LIFE**

What is the connection of sandstorms and trees?

Young children live in the real world in which they will face many real problems related to development. Taking these real problems or questions as the starting point, the project actively be organized in order to give them the opportunity to participate in society, to express their own and to find solutions. The following network shows the project activities of 'Sandstorm'. Since it occurs every spring in Beijing. The kindergarten teachers initiated the project (see Figure 2). The drawings by 5- to 6-year-old children (see below, photos 1-8) show their understanding and solutions to the problems.

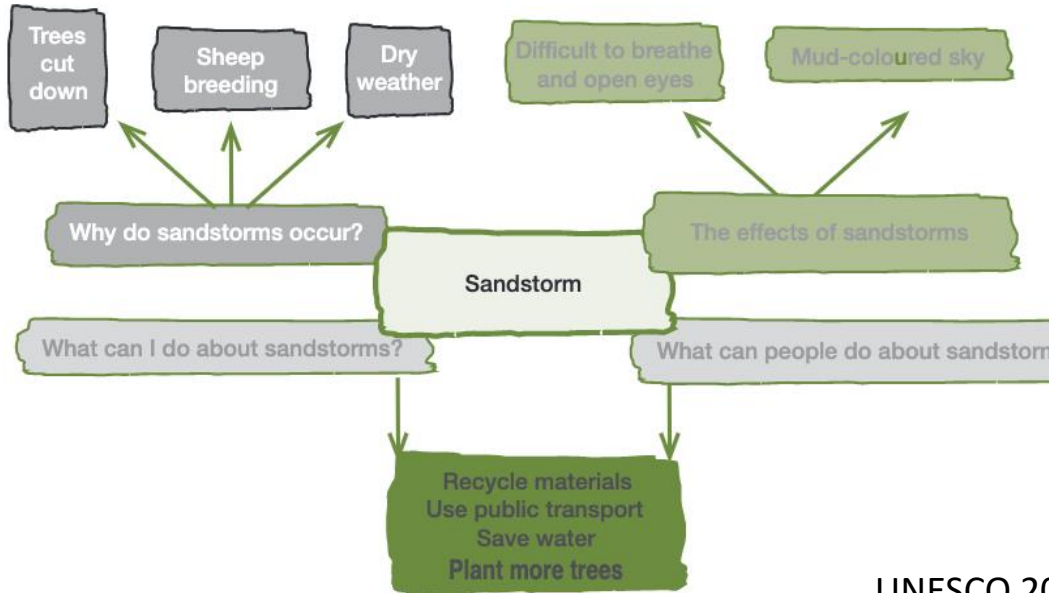


Figure 2. The 'Sandstorm' project.



1. The poor tadpoles were in the plastic bag that was thrown into the pool, and they cannot go out of it and find their mother.



4. Saving water.



2. I will tell my dad not to drive one day every week to reduce the air pollution.



6. Pull out the plug when not using the electric fan.



3. The used batteries will pollute the soil and the grass will die.



7. Boxes, used toys, clothes, tires are recycling materials.



5. Cherry trees and grass.



8. Used paper, glasses, CDs, plastic flowers, ladder, books, straws, shells are recycling materials.

UNESCO 2008



TERRITORIAL RANGE DEVELOPMENT

MIDDLE CHILDHOOD: 8 -12 years



Child-Nature Relation

Informal, spontaneous play – Open with biodiverse spaces away from a Neither ends of means fixed. Stimul

- Physical health
- Creativity
- Sensory integration
- Positive social relations
- Agency / locus of control
- Tacit knowledge
- Construction of knowledge thro undirected attention.

Formal instruction – mainly indoors

Nonformal learning – Interaction w direct, intentional and sustained.

Moore and Wong, 1997.







- The importance of Hort woods
- Improving the campus environment / Healing the site
- Providing opportunities for environmental education





• Process

- Goal Setting / Vision
- Working within PSU
- Programming
- Design Charrette
- The design team





Elfin Woodland
• Low Deck
• Whimsical Wood Gate
• Maintenance Access

Sand and Water Play

Lawn
• Vine Tunnel

Earth Play
• Ornamental Grasses

Play Hills
• Blueberry Hill

Acoustic Play

Rain Barrel

Home Base
• Blueberry Platform
• Red Chair
• Flowering Trees

Treehouse
• Loose Parts Play

Story Circle

Bird Houses

Rock Play
• Climbing Rock
• Rocking Boulder
• Sand Play
• Bamboo Grove

Nest

Gate
• Maintenance /
• Stroller Access

Infants / Toddler Area
• Leaf Structure
• Shade Planting
• Sensory Path

Bird Feeders

Entry Courtyard
• Herb Woods Plant
• Diagonal Grove
• Low Shrubs for E
• Thermal Concrete
• Animal Tracks
• Curved Benches

Garden Play Area
• Butterfly and Sensory Garden
• Sand Play with Dabbling Rock
• Butterfly Sensory Wall
• Millstone Garden
• Bumpy Lawn
• Grove Motor Court
• Gentle Lawn and Rocking Rock
• Planter Courts

Allen Rd. Planting
• Shrubs and Groundcovers

ALLEN ROAD

- Replacing the parking lot with the center
- Saving trees / Expanding the Woods
- Creating connections to Nature





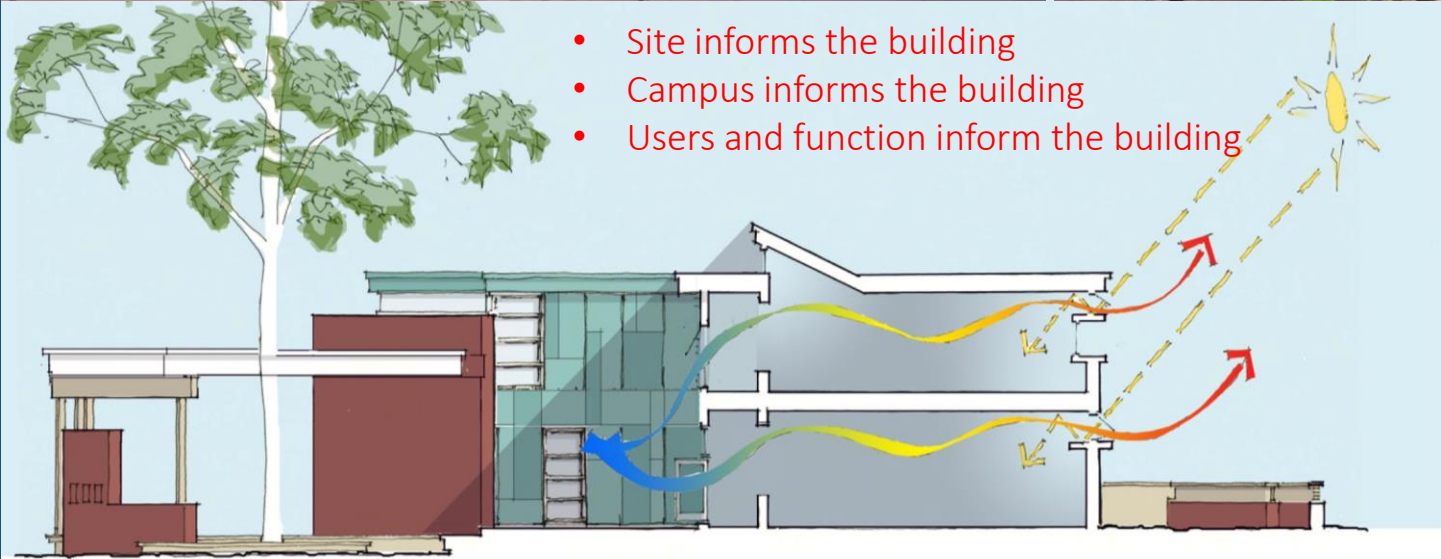
Affordance, behavior/activiy setting; time, space, and child development







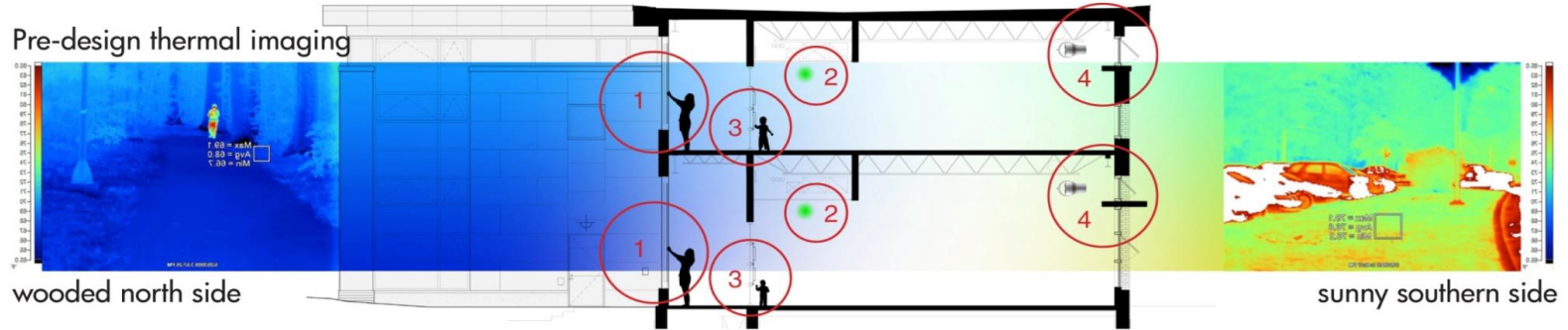




- Site informs the building
- Campus informs the building
- Users and function inform the building



Step by step process in which both children and staff work together to activate the passive cooling system







Affor









OUTDOOR COMPONENTS FOR PLAYING AND LEARNING

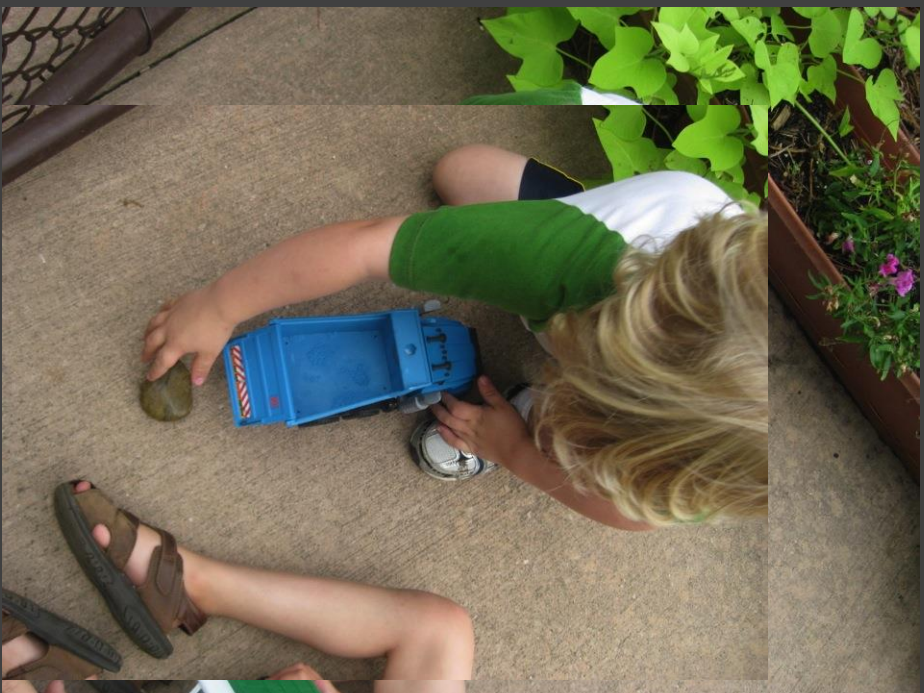
Natural & Manufactured / Fixed & Loose

	NATURAL	MANUFACTURED	MIXED
FIXED	X	X	X
LOOSE	X	X	X
MIXED	X	X	X

- Fixed and loose:
- Manufactured and Natural.









- **Manufactured portable**





INFANTS: 6 weeks to around 12 months.



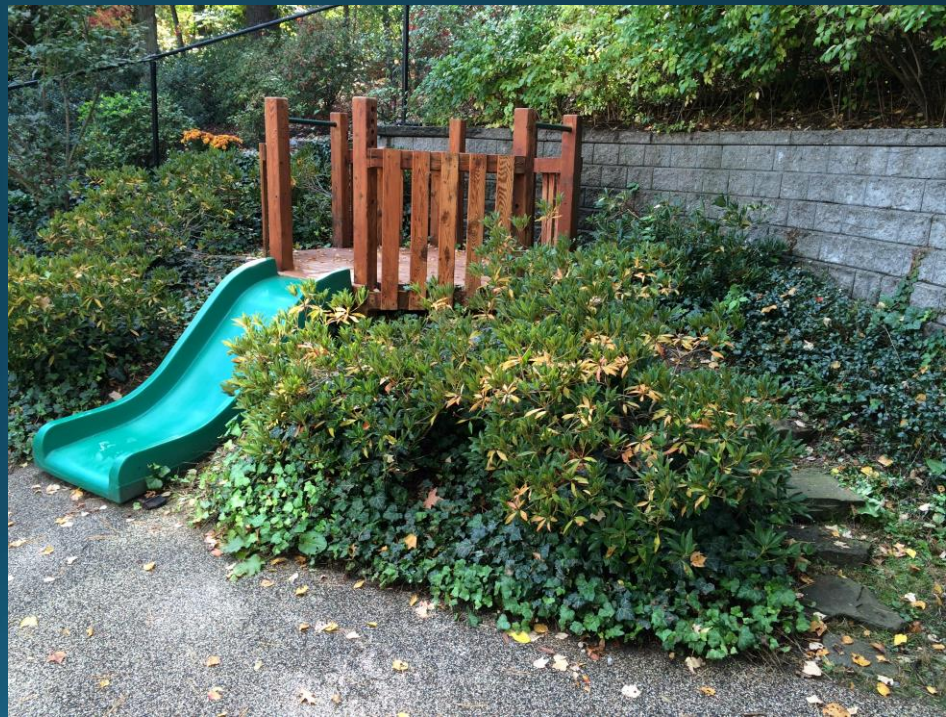
TODDLERS: >12 months, walking, still diapers. **TWOS:** 24-36 months



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PRESCHOOL: 3 to 5 years



PRESCHOOL: 3 to 5 years



PRESCHOOL: 3 to 5 years



PRESCHOOL: 3 to 5 years



PRESCHOOL: 3 to 5 years



Gardening as a vehicle for interdisciplinary learning





Incremental Development



Incremental Development







Plants	216
Animals	102
Birds	43
Total	361

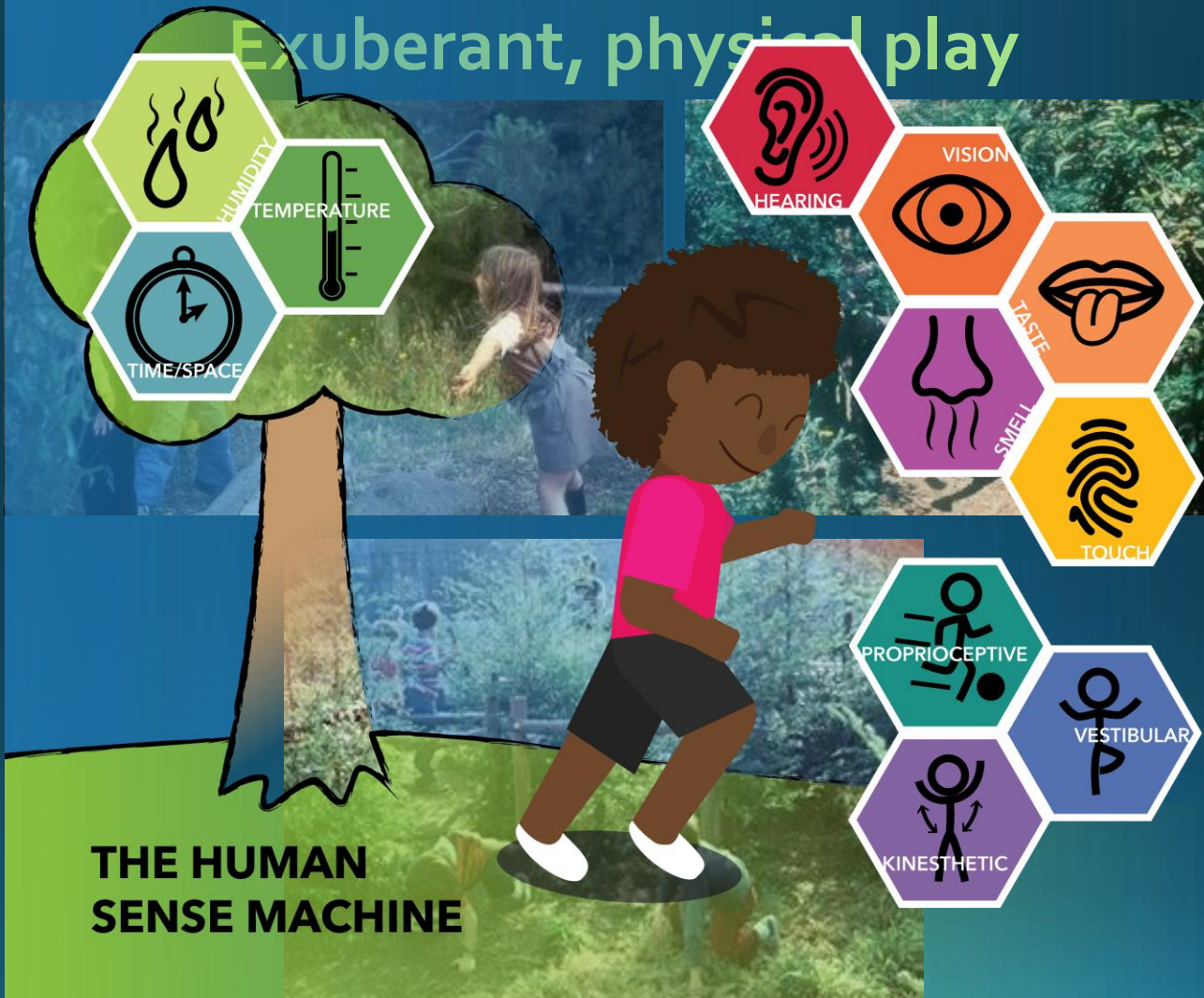
The Life History of an Environmental Schoolyard
Natural Learning



*Creating Environments for Rediscovering
Nature's Way of Teaching*

BOBIE D. MOORE & JERIN IS. WELLS

Exuberant, physical play



**THE HUMAN
SENSE MACHINE**

Natural “free” play and construction



Floral play and learning

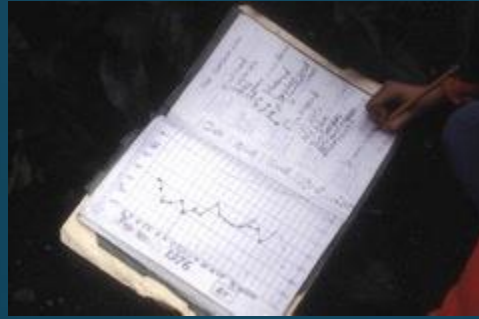




Nature motivates active, focused learning



Learning through gardening



HANDS-ON INTEGRATED LEARNING



READING



SOCIAL
STUDIES

ARTS &
HUMANITIES

HANDS ON OUTDOOR
ENVIRONMENT



MATH

SCIENCE &
HEALTH

LANGUAGE

UNDERSTANDING ECOLOGICAL CONCEPTS



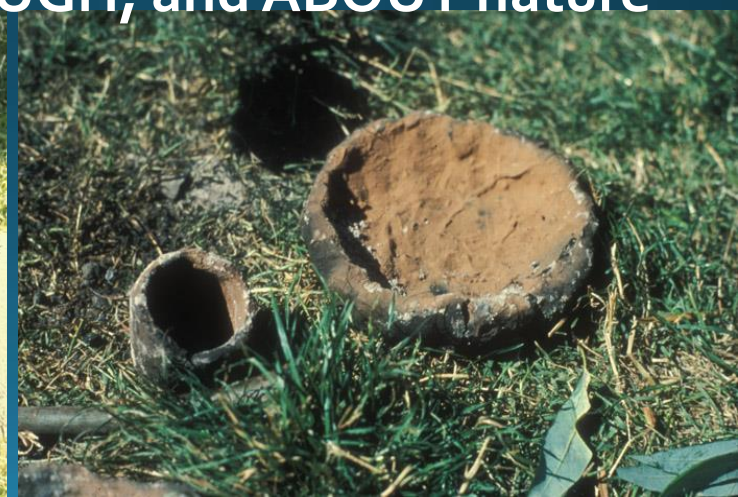
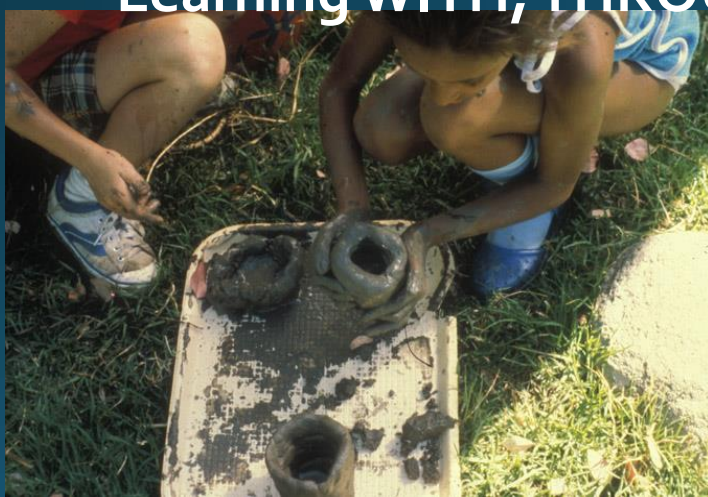
THE WHOLE CHILD: DEVELOPMENTAL SKILLS



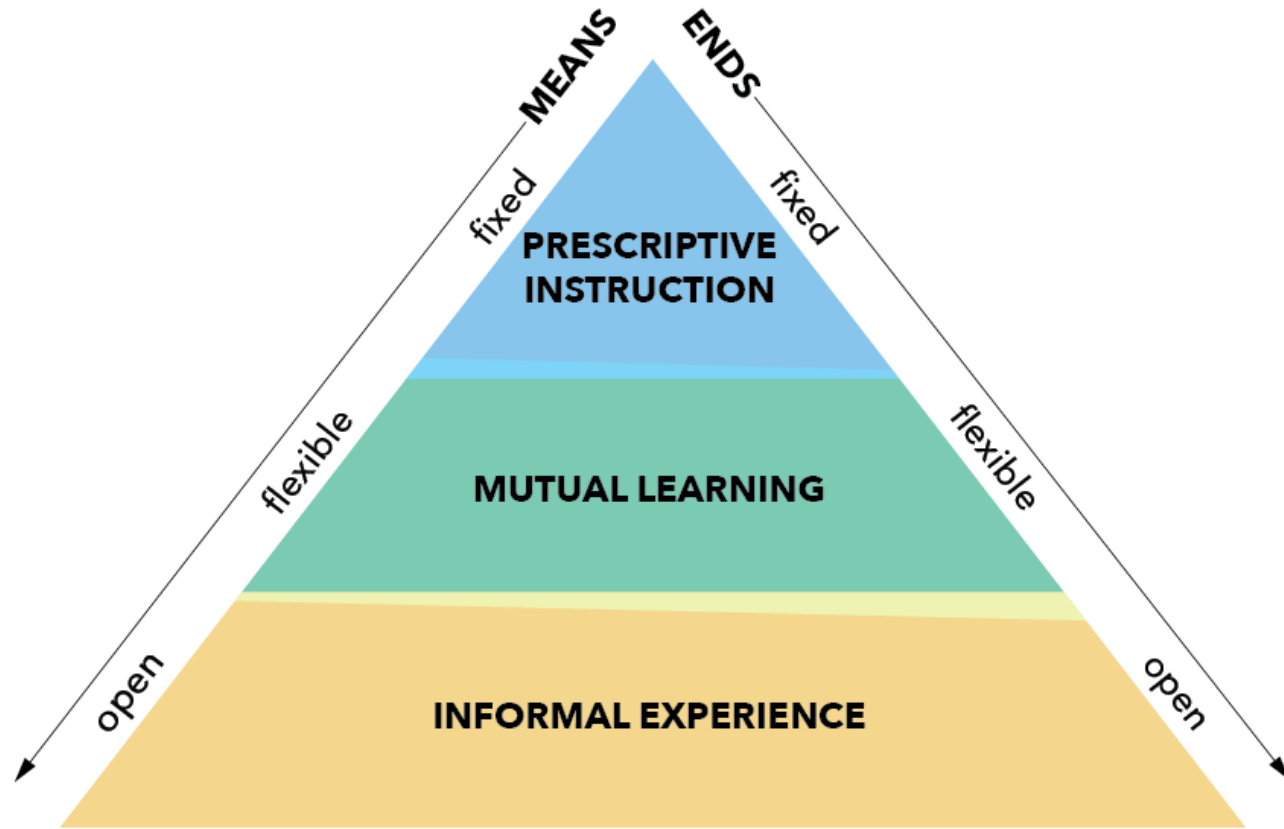
Play > learning > education continuum



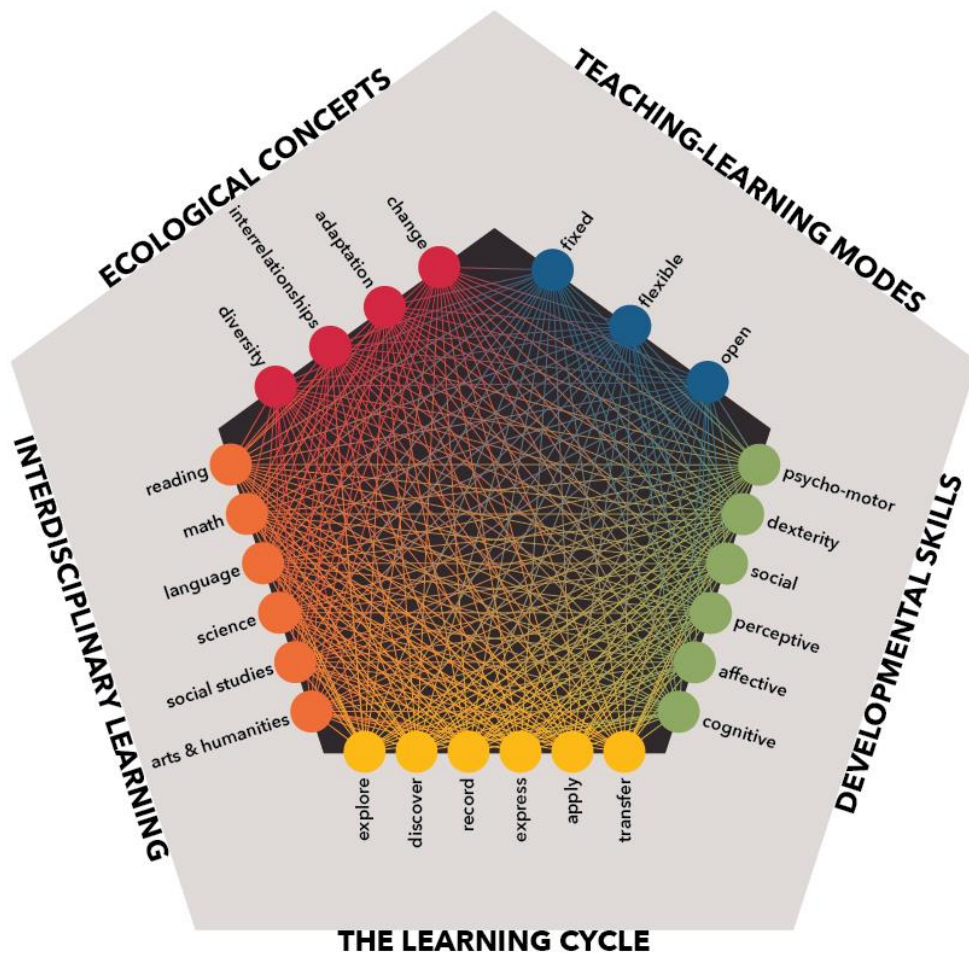
Learning WITH, THROUGH, and ABOUT nature



TEACHING / LEARNING MODES



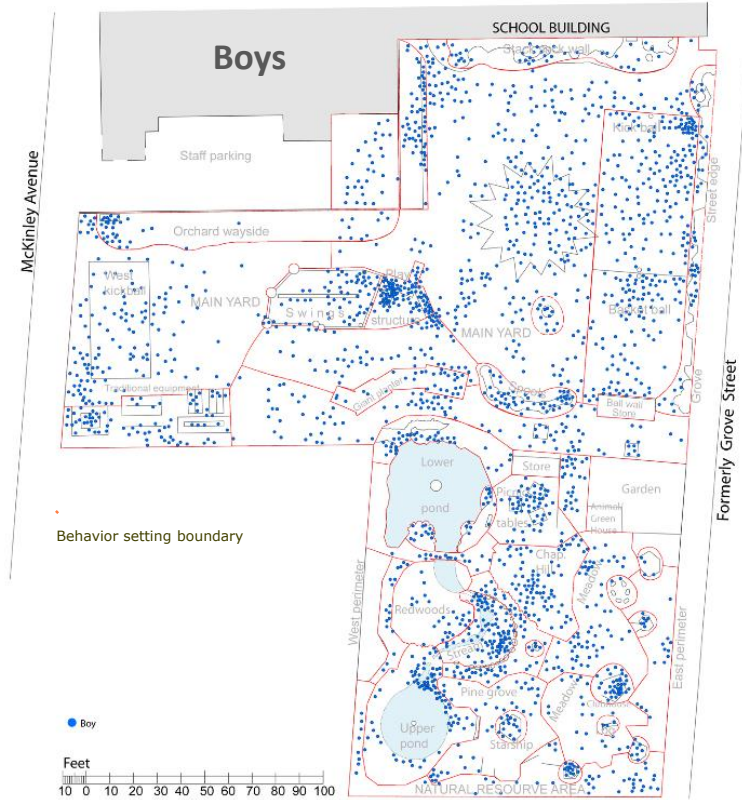
THE CURRICULUM SWITCHBOARD



Behavior maps by gender



Behavior Map (girls)
Observations conducted in May/June 1977



Behavior Map (boys)
Observations conducted in May/June 1977

Play and learning activity settings

- Welcoming entrance
- Indoor-outdoor transition
- Pathways
- Gathering space
- Arbors, pergolas,
& trellises
- Multipurpose lawn
- Sand & earth play
- Water play
- Decks and stages
- Tunnel
- Playhouse
- Sensory garden
- Grass maze
- Rain garden
- Vegetable garden
- Garden shed
- Animal habitat garden
- Play hills and topography
- Play structure
- Loose parts and play props
- Outdoor storage
- Acoustic play
- Project space
- Outdoor classroom
- Performance space
- Grove (small trees/large shrubs)
- Cut flower garden

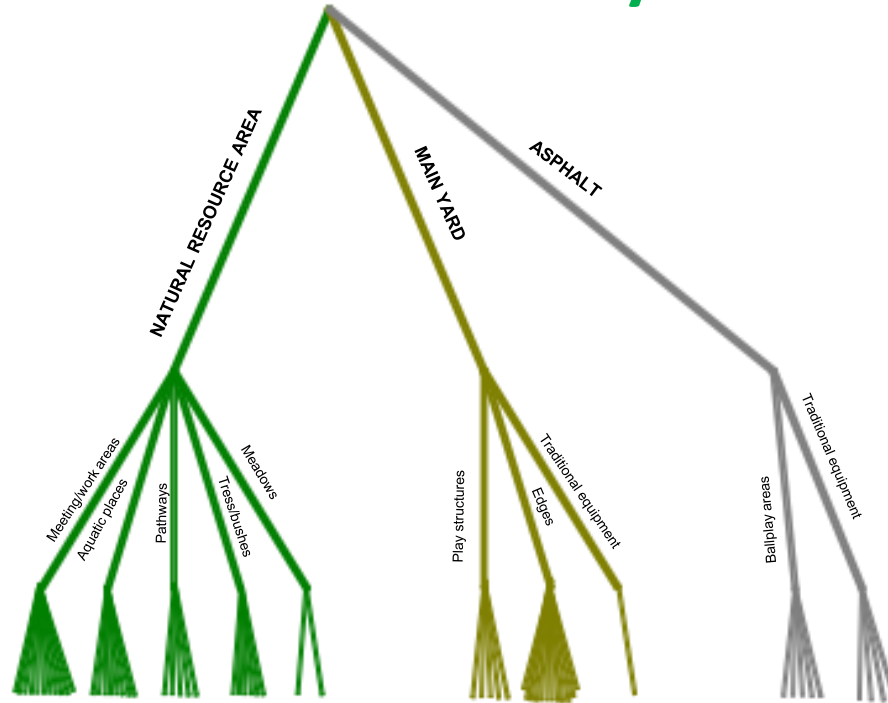
Environmental Yard Ecosystem

3 Primary Zones

10 Behavior-Environment Ecosystems

56 Activity Places

Number of Activity Places	11	8	5	6	2	4	12	1	4	5	Total
Percent Use	11	9	6	6	6	14	12	7	17	12	100
Percent Space	4	6	5	6	5	7	13	8	26	20	100
Use/Space Ratio (USR)	2.8	1.5	1.2	1.0	1.2	2.0	0.9	0.9	0.7	0.6	1.0



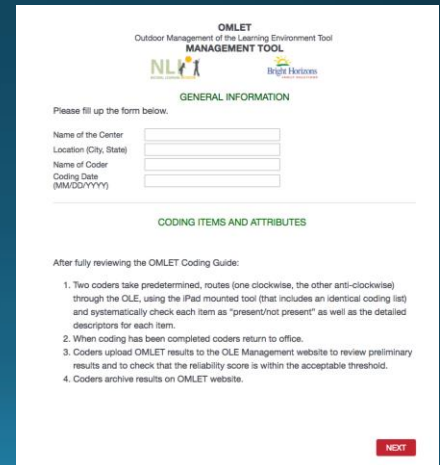
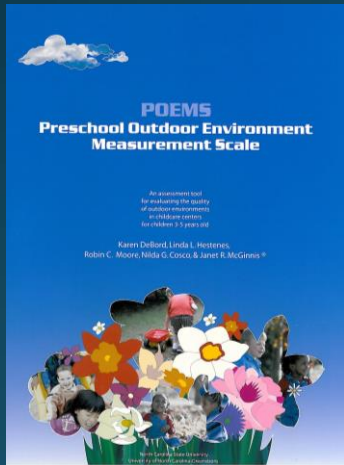
EVALUATION TOOLS

POEMS Preschool Outdoor Environment Measurement Scale

COLEQT Childcare Outdoor Environment Quality Tool

OMLET Outdoor Management of the Learning Environment Tool

E-BMAP Environment-Behavior Mapping Tool



NLI Certificate Programs

For Early Childhood Educators

Early Childhood Outdoor Learning Environments



For Designers

Designing Early Childhood Outdoor Environments



Audience

- Early childhood educators
- Technical Assistance providers
- Cooperative Extension Agents
- Master Gardeners
- Park and Recreation Professionals
- Volunteers working with early childhood institutions
- Designers

Fully online

Self-paced

Thanks!

www.naturalearning.org

