

PlayScapes: Designed Nature Environments to Promote Informal Science Learning

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Eastern Deciduous Forest



There are four distinct seasons: winter, spring, summer and fall.

Deciduous Forest: Plants

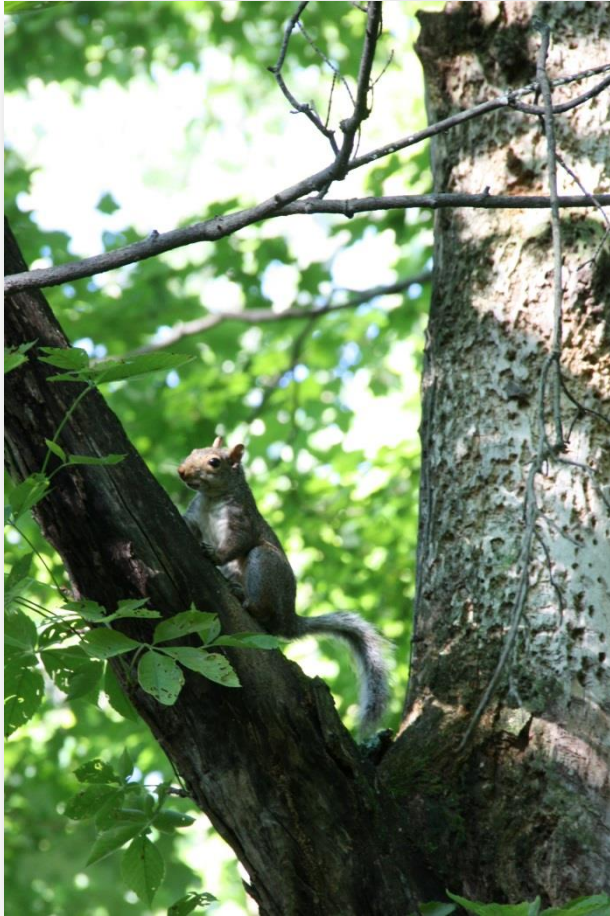
Trees such as maple, oak, hickory, and beech, hemlock, spruce, and fir are abundant. Shrubs like viburnum and spice bush are also in the forest.



Lichen, moss, ferns, wildflowers and other small plants can be found on the forest floor.



Deciduous Forest: Animals



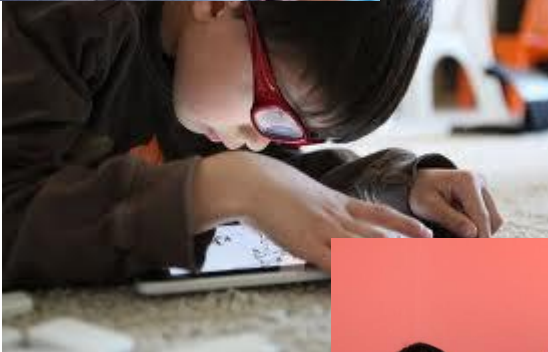
Mammals commonly found in a deciduous forest include bears, raccoons, squirrels, skunks, wood mice, and deer.

Diversity in Deciduous Forests

Insects, spiders, slugs, frogs, turtles, salamanders, and snakes, mostly non-poisonous are common.

Birds like hawks, cardinals, owls, songbirds, and woodpeckers abound.





A playscape is an intentionally designed, dynamic, vegetation-rich play environment that nurtures young children's affinity for nature.



Five Playscape Principles:

(Carr & Luken; Cincinnati Playscape Initiative)

- Playscapes elicit hands-on, multi-sensory, unique and personal experiences for children where nature is the focus.
- Areas within the playscape are designed to be open-ended with multiple and divergent uses.
- Selected playscape plants and materials are ones that can be found in nature, preferably indigenous to the local landscape.

Five Playscape Principles (continued)

- Playscape materials provide opportunities to be touched, manipulated, dug, moved, picked, dammed, climbed, built, and experienced by children as they choose to do so.



- Playscapes are built to encourage risk-taking, investigation, language, sensory experiences, child-directed dramatic and themed play, and collaborative and active play.

Playscape Elements

(Carr & Luken; Cincinnati Playscape Initiative)

- Accessible water –streams, fountains, wading ponds
- Unlevel topography
- Gardens and/or edible landscape materials
- Sand, rocks, boulders
- Trees, grasses, shrubs, flowers, herbs, etc.
- Hiding places, tunnels, felled logs, and digging pits

Playscape Elements: (Carr & Luken; Cincinnati Playscape Initiative)

(continued)

- Nature-themed art or some play equipment may be included, but do not intrude upon or dominate the playscape
- Seating for adults to observe children's play
- Storage for child-sized equipment (shovels, buckets, magnifying glasses, binoculars, etc)

Cincinnati Nature Center PlayScape



UC's Arlitt Child & Family Research & Education Center PlayScape



Arlitt PlayScape Opening August 2012

https://www.youtube.com/watch?v=F90gRNa_BAU



PlayScapes: Designed Nature Environments to Promote Informal Science Learning (NSF

1114674)

Aims are to study:

- 1) children's behavior and movement patterns in the PlayScapes
- 2) children's scientific thinking that may occur during play
- 3) the relationship between time spent in the PlayScapes and children's attitudes about science

Participants

11 preschool teachers and
38 Children *Program 1*
37 Children *Program 2*

- *Program 1* Fall 2012

- 3 visits Arlitt
- 3 visits CNC

- *Program 1* Spring 2013

- 3 visits CNC

- *Program 2* Fall 2012

- 3 visits Arlitt
- 3 visits Arlitt Playground

- *Program 2* Spring 2013

- 3 visits Arlitt
- 3 visits CNC

Data Measurements

1. CURRICULUM-BASED ASSESSMENT (CBA)
2. BEHAVIOR MAPPING
3. VIDEO & AUDIO
4. TEACHER FOCUS GROUPS

“[The playscape] enriches our lives as teachers.

No doubt we’ re seeing the benefits and differences in play.” - teacher 2012

Curriculum-Based Assessment (CBA)

Initial Measure

Baseline understanding of science
concept knowledge and inquiry skills

Concluding Measure

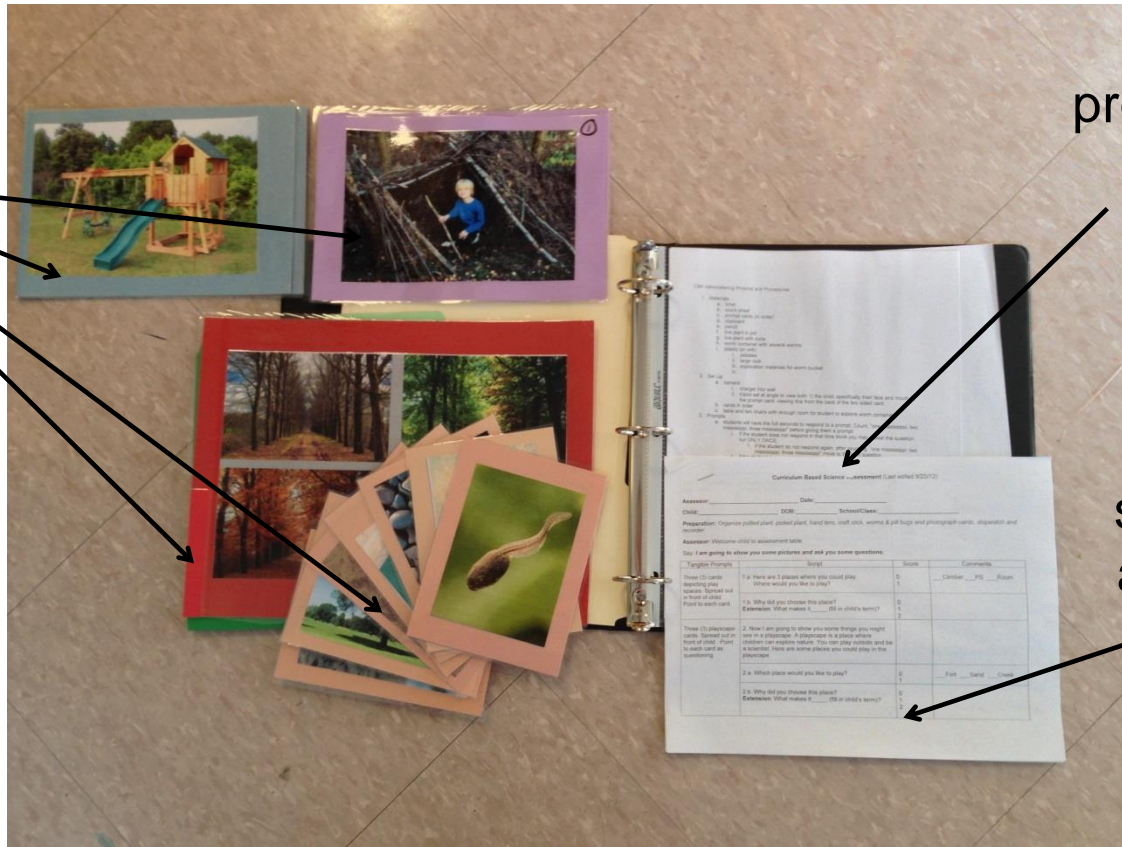
Retest using identical measure after
8 months of playscape exposure

CBA

Assessment cards

procedure and protocol

score sheet and prompt



CBA Protocol Snapshot

Curriculum Based Science Assessment (Last edited 9/20/12)

Assessor: _____ Date: _____

Child: _____ DOB: _____ School/Class: _____

Preparation: Organize potted plant, picked plant, hand lens, craft stick, worms & pill bugs and photograph cards.

Assessor: Welcome child to assessment table.

Say: I am going to show you some pictures and ask you some questions.

Tangible Prompts	Script	Score	Comments
Three (3) cards depicting play spaces. Spread out in front of child. Point to each card.	1.a. Here are 3 places where you could play. Where would you like to play?	0 1	___ Climber ___ PS ___ Room
	1.b. Why did you choose this place? Extension: What makes it _____ (fill in child's term)?	0 1 2	
Three (3) playscape cards. Spread out in front of child. Point to each card as questioning.	2. Now I am going to show you some things you might see in a playscape. A playscape is a place where children can explore nature. You can play outside and be a scientist. Here are some places you could play in the playscape.		
	2.a. Which place would you like to play?	0 1	___ Fort ___ Sand ___ Creek



CBA Significant Results

- Overall score increased 3.5 points out of 31 possible for all students at the post assessment versus pre assessment

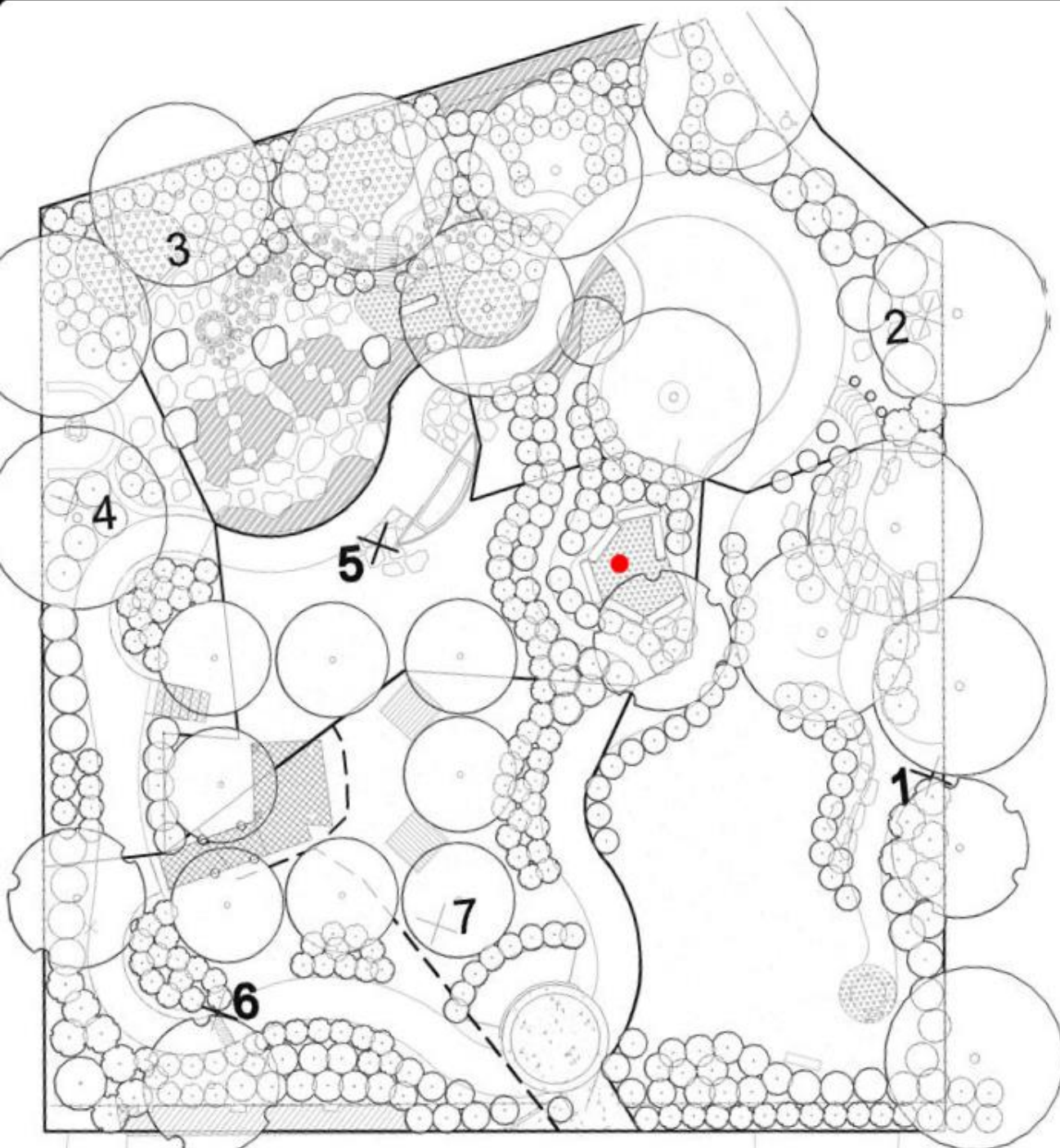
Individual CBA questions related to the following increased significantly:

- Placing items into living and non-living categories
- Identifying seasonal changes at the playscape
- Inquiry and detailed descriptions of investigations with worms and pillbugs in dirt

Behavior Mapping (& Creation of an iPad App)

Systematic and unobtrusive method for studying connections between behaviors and the physical characteristics of a designated area (Moore and Cosco, 2010)

- records locations and codes behaviors
- Examines behavior settings and affordances
- Captures child's movement and engagement



Student Number

#1

1	2	3
4	5	6
7	8	9
0	Del	

Empty Zone

Cancel

Next

Student #1

Adult Present

Yes

No

Interaction

Pair

Child Movement

Engagement

Social/Material Engaged

Environmental Interaction

Loose/Natural

Loose Parts

Rocks; Tree Cookie; Gravel

Probable Science Learning

Yes

No

Stationary

Fine Motor

Gross Motor

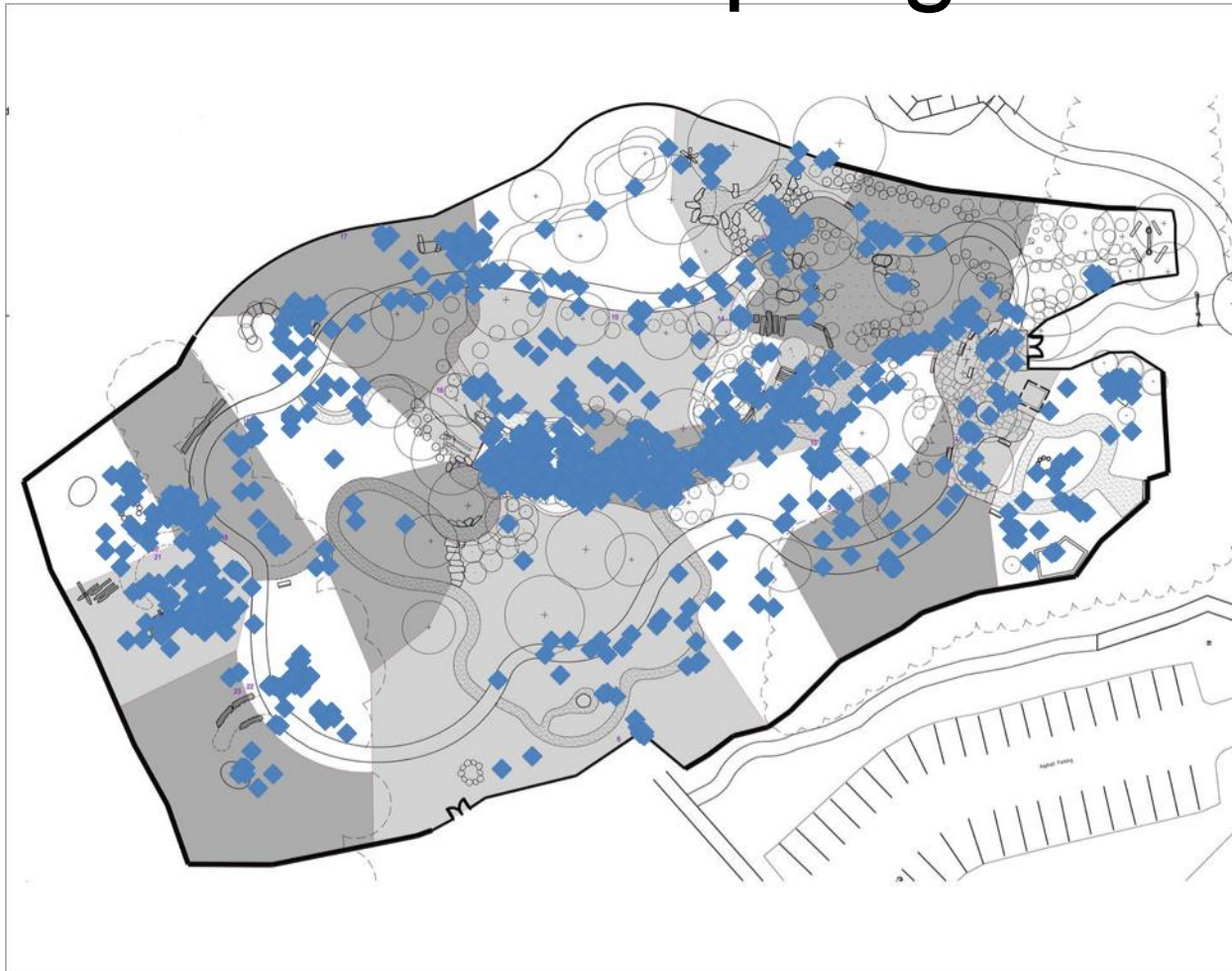
Comments

2012 Pilot included play categories.
This represents the 2012-13 revision
whereby the data is still in analysis.

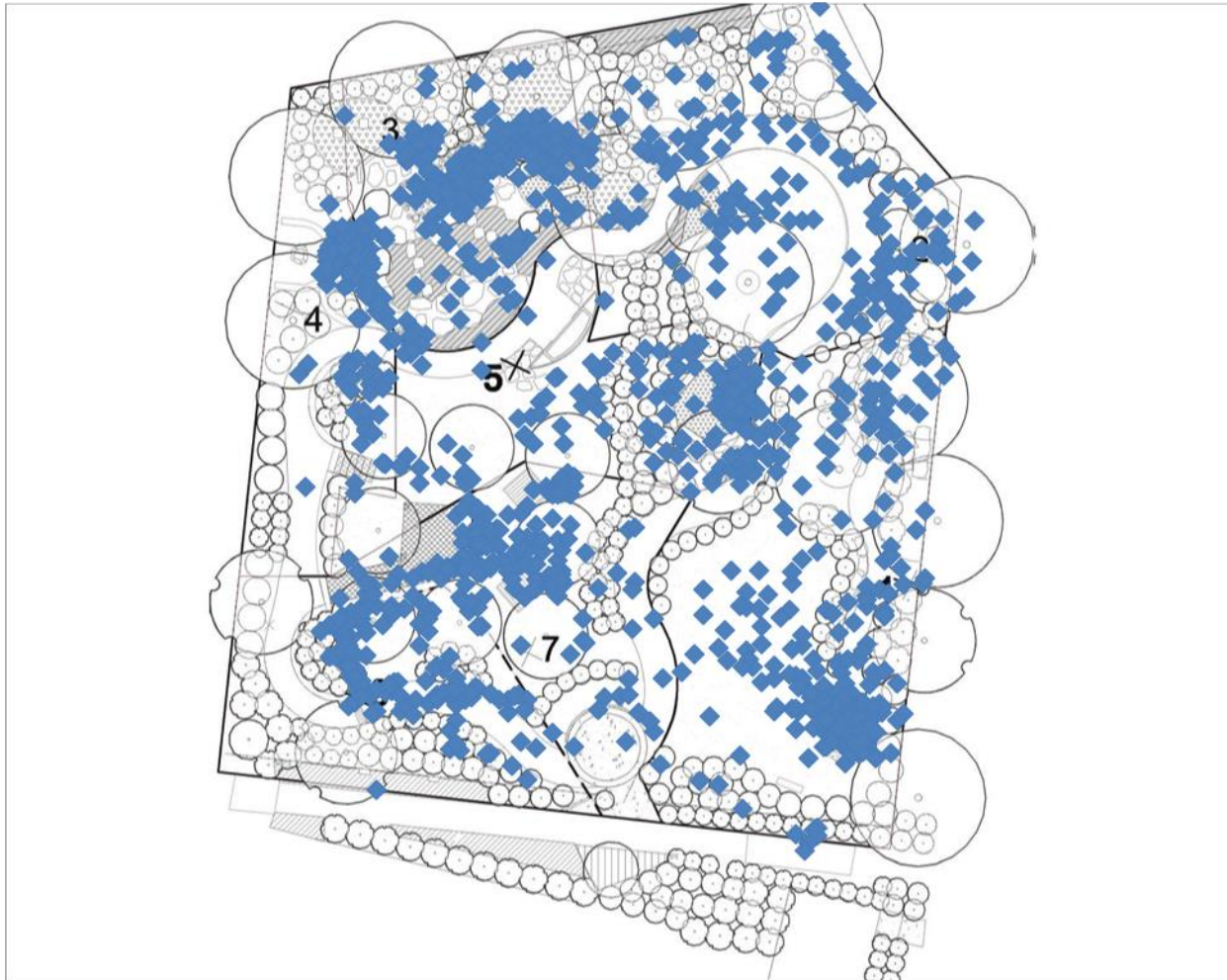
Cancel

Ok

All data points for CNC PlayScape Fall 2012 & Spring 2013



All data points for Arlitt PlayScape Fall 2012 & Spring 2013



Observational Video

Spring 12	Fall 12	Spring 13
Nature Center PlayScape: 2.5 hrs	Nature Center Playscape: 3.1 hrs	Nature Center PlayScape: ~5 hrs
Arlitt Playground: 25 min	Arlitt Playground: 3.5 hrs Arlitt PlayScape: 5.6 hrs	Arlitt PlayScape: ~5 hrs

VIDEO DOCUMENTS CHILD-DIRECTED INFORMAL SCIENCE
LEARNING IN THE FORM OF “VIGNETTES”

Example from Video

- Picking flowers for their moms, two girls were discussing how butterflies and bees were “pollening” to get the flowers, making references to gardening at their respective homes

Example from Video

- A girl was watering the end of a stick with leaves at one end multiple times at the pump; then planted it with leaves up and stick side down

Example from Video

- Several children were rolling 'tree cookies' of differing sizes and shapes down a small hill, predicting which ones would go faster

Example from Video

- With a rock in one hand and a small 'tree cookie' in the other hand, one child describes and demonstrates to another how a fat fish would sink and a skinny fish would float

Conclusions

- Our research confirms some of what is suspected or known, but examined the impact of specifically designed affordances on science learning.
- Playscapes are venues for both play and learning across domains: cognitive, language, social, & physical
- More research is needed in this area.

Implications

Many schools and early childhood programs are “greening” their outdoor play spaces, creating playscapes based on aesthetics or other guiding principles.

While this is a trend that is certainly appealing for biophillic and health reasons, nature playscapes also serve as a third teacher for informal science learning.

Arlitt Child & Family Research & Education Center

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