Adventures in Mimicry

Enhancing Children’s Motor Skills Through Imitation Play and Interactive Habitats in the Kansas City Zoo
What Inspired Me?
Path Through College

Landscape Architecture
+
Zoology
Choosing A Site

Kansas City ZOO
Features
Most Common Complaints

I respect and love animals and I don’t want them to be harassed into activities, but you can just tell the KC zoo inhabitants are bored out of their mind. Other zoo’s I’ve been to the animals are more engaging.

- Becki G.

Size of the zoo-it’s quite large, but unlike Omaha or San Diego, it’s not dense at all. There are long walks in between exhibits.

- David A.

With the exception of the kangaroos, it felt like everything we looked at was in cage... ‘things are better when’ they try to recreate an animals natural habitat as much as possible.

- Tanya L.
Design Question

How can zoo environments be designed to create more interactive exhibit space, therefore enhancing motor skill development in children?
Exhibits that challenge their inhabitants both mentally & physically

Using mimicry to develop motor skills in children

Breaking down visual barriers between animals and visitors

Engaging

Imitating

Connecting
Landscape as Playscape: The Effects of Natural Environments on Children’s Play and Motor Development
Ingunn Fjørtoft
Telemark University College

Three Types of Play

1. Functional Play
2. Constructive Play
3. Symbolic Play

<table>
<thead>
<tr>
<th>Tests</th>
<th>Experimental Group</th>
<th>Comparison Group</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Test</td>
<td>Post-Test</td>
</tr>
<tr>
<td>Flamingo (# of instabilities in 30 seconds)</td>
<td>4.7 (0.8)</td>
<td>1.5 (0.3) ***</td>
</tr>
<tr>
<td>Plate Tapping (time in seconds for 50 taps)</td>
<td>35.0 (1.9)</td>
<td>28.1 (1.2) ***</td>
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<tr>
<td>Sit and Reach (cm)</td>
<td>24.9 (0.8)</td>
<td>24.4 (0.8)</td>
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<tr>
<td>Standing Broad Jump (cm)</td>
<td>102.8 (2.9)</td>
<td>113.1 (3.6) ***</td>
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<tr>
<td>Sit-Ups (# in 30 seconds)</td>
<td>5.3 (0.6)</td>
<td>6.5 (0.6) **</td>
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<tr>
<td>Bent Arm Hang (seconds)</td>
<td>2.6 (0.4)</td>
<td>7.0 (1.0) ***</td>
</tr>
<tr>
<td>Beam Walking (seconds)</td>
<td>11.4 (1.4)</td>
<td>7.5 (0.7) **</td>
</tr>
<tr>
<td>Indian Skip (# in 30 seconds)</td>
<td>21.8 (2.2)</td>
<td>43.6 (1.9) ***</td>
</tr>
<tr>
<td>Shuttle Run (seconds)</td>
<td>31.9 (0.7)</td>
<td>29.7 (0.5) **</td>
</tr>
</tbody>
</table>

Natural Environment’s Effects on Motor Skills
Orangutan Canopy
Kansas City Zoo

Features

1. Outdoor Forest
2. Orangutan University
3. Orangutan Agility Course

Zoo’s Incorporation of Play
Location

Kansas City Zoo Site
Movement
- Circulation

Inhabitants
- Species Involved
- Barrier Style
- Enrichment Options

Visitors
- What are Motor Skills?
- Motor Skill Table
- Where is Play Encouraged
**Movement**
- Circulation

**Inhabitants**
- Species Involved
- Barrier Style
- Enrichment Options

**Visitors**
- What are Motor Skills?
- Motor Skill Table
- Where is Play Encouraged
Circulation Patterns

Pathway System
- Public
- Private
- Unused

Decommissioned Ape Exhibit
Inaccessible Exhibit
Open Gravel Pit
No Public Access
Movement

- Circulation

Inhabitants

- Species Involved
- Barrier Style
- Enrichment Options

Visitors

- What are Motor Skills?
- Motor Skill Table
- Where is Play Encouraged
Species

- Emu
- Black Swan
- Waterfowl
- Camel
- Sheep
- Llama
- Red Kangaroo
- Tree Kangaroo
- Dingo
- Koi
- Goat
## What is Enrichment?

<table>
<thead>
<tr>
<th>Physical</th>
<th>Mental</th>
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<tr>
<td><img src="image1" alt="Permanent Physical" /></td>
<td><img src="image2" alt="Permanent Mental" /></td>
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<tr>
<td><img src="image3" alt="Temporary Physical" /></td>
<td><img src="image4" alt="Temporary Mental" /></td>
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</tbody>
</table>
Enrichment

- Aviary
- Dingo
- Emu
- Red Kangaroo
- Tree Kangaroo
- Waterfowl
- Sheep
- Camel
- Goat
- Llama
- Koi
### Movement
- Circulation

### Inhabitants
- Species Involved
- Barrier Style
- Enrichment Options

### Visitors
- What are Motor Skills?
- Motor Skill Table
- Where is Play Encouraged
What Are These Examples Of?
What Are Motor Skills?

Gross Motor Skills

Fine Motor Skills

Combined Motor Skills
## Motor Skill Match-ups

<table>
<thead>
<tr>
<th>Species</th>
<th>Gross Motor Skill</th>
<th>Fine Motor Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emu</td>
<td>Digging</td>
<td>Preening</td>
</tr>
<tr>
<td>Dingo</td>
<td>Running</td>
<td>Tearing</td>
</tr>
<tr>
<td>Aviary</td>
<td>Flying</td>
<td>Opening Small Objects</td>
</tr>
<tr>
<td>Red Kangaroo</td>
<td>Jumping</td>
<td>Object Recognition</td>
</tr>
<tr>
<td>Tree Kangaroo</td>
<td>Climbing</td>
<td>Puzzles</td>
</tr>
<tr>
<td>Waterfowl</td>
<td>Paddling</td>
<td>Holding Breath</td>
</tr>
<tr>
<td>Camel</td>
<td>Carrying</td>
<td>Chewing</td>
</tr>
<tr>
<td>Sheep</td>
<td>Pushing</td>
<td>Braiding</td>
</tr>
<tr>
<td>Llama</td>
<td>Kicking</td>
<td>Braiding</td>
</tr>
<tr>
<td>Goat</td>
<td>Jumping</td>
<td>Chewing</td>
</tr>
<tr>
<td>Koi</td>
<td>Swimming</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Types of Play

- Active
- Passive
- Structured
- Adaptive
Where Is Play Encouraged?

- Kangaroo Scenic View
- Broken Nest Egg
- Interactive Ecology
- Gravel Pit
- Playground
- Garden & Picnic
- Discovery Barn

Legend:
- Active
- Adaptive
- Structured
- Unused
- Passive
- Adaptive
- Passive
- Structured
Preliminary Master Plan
Kangaroos & Tree Kangaroos

Pest Species, Sheep, Llamas, Bats

Goats, Donkey, Koi

Ducks, Camels, Tasmanian Devil, Koala, Platypus, Spiders, Snakes

Birds, Emu, Dingo

Creating Zones
Retaining Wall
Play Interruption
Climbing Stones
Synthetic Turf
Play Interruption
Fallen Timber
Entry Points
Two Path Entrances
Interior Den Entrance
Viewing Windows
Play Interruption
Agility Poles
Sneak Peak Windows
Open Window
Tunnel System
Keeper Access Point
Play Den

Preliminary
Dingo Run

Systems
Topography
Primary Path

STAMPED CONCRETE

Lookout Rocks
1’ - 3’ NATURAL STONE

Entry Sign
ENGRAVED

Wishing Well
METAL BASIN
FOR RESONATING SOUND

Boardwalk
COMPOSITE

Circular Deck
COMPOSITE

Marshwalk
RUBBER REEDS

Fish Food
ANIMAL INTERACTION

Koi Pond
10’ DEPTH

Waterfall
7’ HEIGHT

Waterfall
7’ HEIGHT

Fish Sculpture
REFLECTIVE

Play Interruption
FISH FEEDER

Spongy Path

Tree Planting

Rain Garden

Wishing Wells

Boardwalk

Main Paths
10’ WIDTH

STAMPED CONCRETE

Koi Pond
10’ DEPTH

Systems

Section
Composition

Preliminary
Koi Pond
Preliminary Zones
Final Design
Motor Skills

Motor Skill Plan

- Throwing
- Pushing
- Pulling
- Climbing
- Running
- Jumping
- Swimming

Play Intervention:

- Dig Site
- Nest Building
- Dingo Run
- Mental Puzzles
- Koala Climb
- Kangaroo Hop
- Paddle Pond
- Water Swirl
- Braiding Station
- Bunny Hop
- Mountain Climb
- Marshwalk
Dingo Run
Concrete Path

Crushed Fines

Faux Limestone Enclosure

Open Window Viewing

Crushed Fines

Dingo Run
Tunnel To Freedom

Red Concrete
Synthetic Turf
Crushed Fines

Glass Window
Open Window
Wall 8
Dingo Den
Dingo Tunnel

Tunnel To Freedom
Marsh Boardwalk

- Rubber Reeds
- Transparent Mesh Reed Panel
- Marsh Entrance
- Composite Boardwalk
- Fish Feeder
- Limestone Fountain
Rubber Reeds

Limestone Jumping Rocks

Soil

Concrete Base

Pour-in-Place Rubber Safety Surfacing

Rubber Reed Casing

Plastic Cap

#2 Rebar

Pour-in-Place Rubber

4"

8"

Concrete Base

Soil

Rubber Reeds
Primite Wooden Fence

Wall Climb

Rope Climb

12" Rubber Surface

Four - Limb Climb

Primitve Wooden Fence

6" Rubber Surface

Koala Climb
Nest Building Section

- 3' Soil Depth
- Drainage passes through to permeable surface below
- Cubby System categorizes pieces by size
- Concrete Form to Mimic a Soil & Rock Mixture
- 1.5% Slope for Drainage
- Low openings provide opportunity for shorter children, or those with limited mobility
- 6' Full Height

- Mexican Feather Grass
- Dusky Cranesbill Geranium
- Cat mint ‘Blue Wonder’
- English Lavender

Planting Plan
Bat Exhibit

Processes Involved

1. Mental Focus
2. Body Awareness
3. Sensory Perception

Bat House - Modeled After an Outdoor Public Market

Bat Exhibit - Glass Panel

Whisper Dish

Pea Gravel
Can zoo exhibits be designed to create a more interactive exhibit space, therefore enhancing motor skill development in children?