“Now in myth and ritual the great instinctive forces of civilized life have their origin: law and order, commerce and profit, craft and art, poetry, wisdom and science. All are rooted in the primeval soil of play.”

- Johan Huizinga, Homo ludens: a study of the play-element in culture
The AZCA Playground project is a design-build challenge undertaken by a fifth-year studio in the School of Architecture at the University of Arizona. The studio was charged with designing and constructing a 5000sf playground for children 2-5 years of age. The playground is for the Arizona’s Children Association and is located on their campus in the City of South Tucson.

A public playground is a microcosm of the dialectical relationship between the cultures of risk and security. It is a physical manifestation of society’s values, and therefore holds a unique position in the constructed environment. It facilitates physical activity, stimulates the imagination and offers the opportunity for children to socialize. It is a venue for play, the work of children.

Pedagogically the project was conceived to provide students an educational experience that is analogous to professional practice and comprehensive in scope. The project opened with a pre-design phase. Student teams researched child psychology, early childhood educational theories and philosophies, playground history and global precedents, site analysis and playground codes and design guidelines mandated by the US Consumer Product Safety Commission. Performance criteria were defined as a result of the research: multi-use, multi-sensory, encourage movement, encourage social interaction, and stimulate the imagination through abstraction and complexity.

Students developed iterative schematic designs. Once the adopted design was vetted against the budget our team proceeded with shop drawings, fabrication and construction. The project was executed entirely by students from excavation, concrete walls, fabric formed concrete panels, steel climbing frames and barrier fabrication. Our team received great support in the form of knowledge, materials and equipment from numerous community entities. The project is scheduled for completion August 2012.

Funding: $45,369 Communities Putting Prevention to Work Grant, $7000 Jeff Kozak, $7000 SOA CALA
child psychology

developmental milestones

motor skills
3 mos.
hold head up in a sitting position
hold head up in a standing position
hold head up when sitting
hold head up when sitting
hold head up when sitting

social skills
say 8-10 understandable words
say 3-5 word sentences

sensory skills
turn head towards bright colors

look for objects that are out of sight

scaring a comfort a

speech

object permanence
young infants lack awareness that objects continue to exist when they are out of sight. by 8 months they will remember seeing the object and 10 months they will start to seek it out.

concept + conclusion
a playground project provides the opportunity to design an "ideal" learning and nurturing environment, knowing the developmental milestones that has go through, the ideal playground would nurture children in a way that compliments, guides and promotes these innate pre-configured mental structures.

test of conversation
questions which row has more coins?
the response was:

they are the same

the bottom row

question: which container has more juice?
the response was:

they are the same

the one on the right has it is taller than the other one

what is child psychology?

child psychology is the scientific study of the development process undergone by humans from birth to adulthood. this entails studying and observing the changes in psychological states, emotional states and perceptual ability as a baby develops into adulthood. we hope to understand the fundamental duality of nature versus nurture, whether children are born with inherent instincts and innate developed mental structures or are born as blank slates, feeding off their surroundings and using their experiences to shape their development.

based on the research that we have accumulated, we believe that children are not born blank but with innate pre-configured instincts that begin to surface at specific stages as the child grows regardless of environment. in spite of the previous fact however, nurture still plays a tremendously important part in a child's development as their experiences and learning environment help to shape and guide a child's inherent instincts into healthy adult behaviors and personalities.

child psychology

social skills
smile when excited or communicate hunger, fear, discomfort

social skills

social skills

social skills

social skills

social skills

social skills

social skills

social skills

social skills

social skills

social skills

social skills

social skills

social skills
The eager engagement in pleasurable physical or mental effort to obtain emotional satisfaction (Whyte).

Adolescence not consciously performed for the sake of any result beyond themselves (Cassei).

**Educational Philosophy Basics**

*From birth through age five, with design implications (di)*

**Independent**

*Children are born totally dependent on others, as they grow and develop, they grow more and more independent. Older development stages are the ability to work interdependently with others. In the birth to five year old range, a child is born at least partially dependent even as independence and interdependence grow.*

**Parallel**

*Children are born with the ability to perform solitary play. This ability remains throughout their life, as they mature, children engage in parallel play, playing in proximity to others, but without significant interaction. Older children engage in group play as their abilities and understanding of the world develops and parallel play typically diminishes.*

**Group**

*Children are born as explorers and use this exploration to gain an understanding of the world throughout their lives. As they mature, children enter phases of intuitive play, imitating actions as well as the actions of older children and adults. Older children in the birth to five year old age range begin to engage in truly imaginative play, embracing fantasy and role-playing.*

**Imitative**

*Children are born with the ability to perform solitary play. This ability remains throughout their life, as they mature, children engage in parallel play, playing in proximity to others, but without significant interaction. Older children engage in group play as their abilities and understanding of the world develops and parallel play typically diminishes.*

**Imaginative**

*Children are born as explorers and use this exploration to gain an understanding of the world throughout their lives. As they mature, children enter phases of intuitive play, imitating actions as well as the actions of older children and adults. Older children in the birth to five year old age range begin to engage in truly imaginative play, embracing fantasy and role-playing.*

**Exploratory**

*Children are born with the ability to perform solitary play. This ability remains throughout their life, as they mature, children engage in parallel play, playing in proximity to others, but without significant interaction. Older children engage in group play as their abilities and understanding of the world develops and parallel play typically diminishes.*

**Developmental Milestones**

*The evolution of play with growth*

<table>
<thead>
<tr>
<th>Forms of Play</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tr>
<td>Solitary Play</td>
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<td>Parallel Play</td>
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<tr>
<td>Group Play</td>
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</tbody>
</table>

**Theory in Early Childhood**

*Piaget, Jean*

Piaget’s theory of cognitive development can be used as a tool in the early childhood classroom. According to piaget, children develop best in a classroom where they are active and engaged in meaningful learning experiences.

**Reggio Emilia**

*Second stage preschool**

Reggio Emilia’s approach to organizing the environment is based on the following principles:

- Children must have a choice in their own learning.
- Children must be able to learn through experiences of touching, moving, hearing, and exploring.
- Children must be able to experience and understand with other children and with materials in the environment.
- Children must have endless ways and opportunities to express themselves.

**Evaluation of Principles**

- Montessori
- Waldorf
- Reggio Emilia

**Play (at) 3 mos.**

- Print letters
- Button clothing
- Open cabinets/boxes
- Bounce if held in a bag
- Recognize sentences
- Say 8-10 understandable words
- Say name + address
- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 6 mos.**

- “Hi,” “bye,” “please,” used with crossing
- Say 8-10 understandable words
- Say name + address
- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 9 mos.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 12 mos.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 18 mos.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 2 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 3 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 4 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 5 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 6 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 7 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 8 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 9 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 10 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 11 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 12 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 13 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 14 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 15 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 16 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 17 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 18 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 19 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 20 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 21 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 22 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 23 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 24 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 25 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 26 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive

**Play (at) 27 yrs.**

- Recognize action
- Imitate familiar actions
- Discomfort
- Imitate parents
- Treat animals or dolls as if alive
under the age of six, have an innate path of psychological development. Based on Piaget’s theory, children go through stages of development described by Piaget. Early childhood education occurs through a series of stages described by Steiner’s theory of child development, which divides education into three discrete phases.

Montessori education is fundamentally a model of human development, and an ecosystem in which children are encouraged to develop their maximum potential. Reggio Emilia is a child-centered approach to early childhood education that emphasizes the child’s creativity and active participation in the learning process.

New American children had crude children’s play areas and playgrounds were often a hazard. Games were created from whatever materials were available in the new land. Similar to today’s children, children of the past engaged in play that was both social and solitary, and they developed their own rules and strategies.

Children in the past also developed their own rules and strategies. They created games that were safe and fun, and they learned about the world through play. In fact, play was so important to children that they often used it as a way to learn about the world.

The ‘philosophy of play’ in the early 1920s was that play had a greater shaping power over the character and nature of man than any other activity. Play was considered to be a natural part of human development.

Depression + play in the 1930s

With the onset of the Great Depression, playground development became more focused on the role of play in the lives of children. Children were encouraged to participate in play activities that could be done at home, and playgrounds were designed to be safe and accessible.

1981 the ‘first playground’

The first playground was invented in 1981. It was a simple structure made of wood and was designed to be safe and fun for children. The playground was a place for children to interact with each other, and it was a place where they could learn about the world around them.

1886 the play movement

The play movement was a response to the Industrial Revolution, which had led to the creation of large cities and urban environments. The movement was based on the idea that children should be provided with opportunities to play in safe and supervised environments.

1908 gardens + play?

In 1908, Charles Robinson proposed the idea of using gardens as places for children to play. The idea was based on the belief that children should be provided with opportunities to play in natural environments.

1910 children in court!

In 1910, children began to appear in court as defendants. This was a result of the growth of the criminal justice system, and it was a response to the need for more regulation of children’s play.

1970 modern era

The modern era of playgrounds was characterized by the development of new materials and technologies. The focus was on creating playgrounds that were safe, fun, and accessible for all children.

2001 post-modern era

The post-modern era of playgrounds was characterized by a focus on social issues and the development of playgrounds that were inclusive and accessible for all children.

2011 empirical play is now

Empirical play is now becoming a reality, and it is becoming more common to see playgrounds that are designed to be safe, fun, and accessible for all children.

playground precedent

<table>
<thead>
<tr>
<th>climb</th>
<th>crawl</th>
<th>jump</th>
<th>lie down</th>
<th>run</th>
<th>slide</th>
<th>spin</th>
<th>swing</th>
<th>walk</th>
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<tbody>
<tr>
<td>beige</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>monkey bars</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rope</td>
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</tr>
</tbody>
</table>

American dark ages (playground precedences)

American limitation standardized: high emphasis on safety limits nature of play

Resulted effect: artificial playgrounds undervalued space public deters in play

European enlightenment (playground precedences)

European understanding encourage risks
dynamic play
social community hubs
resulted effect: active communities
new play environment
users encouraged to overcome and analyze risk

Public civic play

Macro: parks, civic spaces
maintained by agencies
micro: multi-aged groups
permanent features

Private semi-public realm

Macro: fenced walls
specific programs
micro: maintenance storage
dynamic objects
accessibility play

accommodating surfaces

ideal surfaces:
Impervious materials such as asphalt and concrete, poured in place hard rubber surfaces.

acceptable surfaces:
Gravel, pea gravel, shredded rubber, rubber mulch.

non accessible playground surfaces:
Grass, preferably cut short.

regardless of the surface material composition, accessible surfaces need to be designed to drain surface water quickly and effectively to avoid hazardous fall situations.

accessing play elements:
Assuming the ground surface is accessible, special considerations may be made to allow handicapped individuals the ability to (vertically) up into the heart of a play structure without the action up. This can be accomplished by the use of accessible sloped ramps.

ramps should be permeable and/or textured to provide traction when wet. such ramps require long distance to achieve a 1:12 accessible slope. accessible ramps up into play structures are not typically required by code.

accommodating units
In order to successfully use handicap children, pre-designed play units to accommodate the height of a child seated in a chair. code requires certain accessible to non accessible play structures refer to codes written.

off the shelf units are available and can be added to any playground. the barrier between the two can be easily added to provide a "roll in" unit which allows a limited swing range. these units require an additional individual with a good amount of body strength to provide adequate acceleration.

if the majority of the playground surface is composed of a material which is not accessible, special consideration is required to gain handicap children access to play structures.

children are not the only individuals participating in play.
Handicapped adults would like to be able to play alongside their children. in the event of an emergency, access to children would be essential.

non accessible situations.

for example, if the majority of the playground surface is composed of a material which is not accessible. special consideration is required to gain handicap children access to play elements. if the majority of the playground surface is composed of a material which is not accessible, special consideration is required to gain handicap children access to play elements.
site analysis

class analysis

residential zoning
commercial zoning

parking + schools

south tucson demographic

pre-design | site analysis

site analysis

campus plan

topography and drainage
vehicular and pedestrian circulation

all vegetation and potential shaded areas
building massing
environment

circulation nodes + pathways
contextual environment

all parking + schools

all parking + schools

south tucson demographic
landscape dynamic

arroyo drainage

spatial gradient

extrusion wall

Material reuse
concrete formwork

landscape rationale

Movement
Accessibility

Imagination

Multi-purpose

Social

Multi-sensory

Maintenance

Access

characteristic color palette: green bark, yellow flowers, tan pods

(grasses)

drought + frost tolerant

Natural Mesquite

Buddleia Marrubiifolia_Woolly Butterfly Bush

Leucophyllum_Texas Sage

(annuals)

(herbaceous)

(mulches)

(low maintenance, fast growing, pest + disease free, conserves water, + lives a long time)

(residues)

characteristic color palette: green, white, pink, purple

Buddleia (black eyes, blue eyes, purple)

(vegetables, fruits, nut trees)

(parasites)

(fence, wall, hedge)

(California coast)

(podocarpus, pine, cypress, fir)

(softwood, hardwood, bamboo)

(montane)
Different age groups respond to and perceive a variety of textures, geometry, speed of movement and heights. In response to these varying levels of perception and basic principles, there is a series of conceptual design shifts in the analytical matrix. The massing wall shifts and subtraction, tube and bridge integration, revised plan, increased tube sections, and connective bridge shifting are all part of this process.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Source</th>
<th>Cost (per tree)</th>
<th>Cost (per cubic yard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona Ash (15 gal)</td>
<td>Destination</td>
<td>$820.00</td>
<td>$75.00</td>
</tr>
<tr>
<td>1&quot;x6&quot; composite decking</td>
<td>HomeDepot.com</td>
<td>$2,287.50</td>
<td>$75.00</td>
</tr>
<tr>
<td>2&quot;x3&quot; square tube (.120)</td>
<td>SuperiorSteelSupply.com</td>
<td>$4,371.72</td>
<td>$200.00</td>
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<td>HomeDepot.com</td>
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<td>$75.00</td>
</tr>
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<td>1.5&quot; round tube (.095)</td>
<td>HomeDepot.com</td>
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<td>$75.00</td>
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<td>18&quot; plate steel (3/16)</td>
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<tr>
<td>Concrete verticle walls</td>
<td>Estimated</td>
<td>$862.92</td>
<td>$75.00</td>
</tr>
</tbody>
</table>

Additional elements include:
- Formwork (used in concrete sawing)
- North and south facing sections
- West transverse sections + trough
- Primary movement
- Climbing or hanging
- Steel folded stairs
- Transportation to site
- Foundation
- Climbing and traversing
- Surface mapping + brickwork

The design criteria include:
- Primary movement
- Climbing or hanging
- Steel folded stairs
- Transportation to site
- Foundation
- Climbing and traversing
- Surface mapping + brickwork

Design elements such as arroyo, bermsing + drainage, and Jocelyn are also incorporated into the design.
**Performance Criteria**

**Movement**
- User group
- Following
- Stepping
- Grasping
- Hanging
- Running

**Texture + Tactility**
- Differentiation
- Tactile
- Visualization

**Spaces suitable for movement in the internal environment.**
- Encouraging children to engage in physiological processes.
- A child's cognitive learning happens through experience.
- Information occurs through multi-sensory input.

**Surface / Material Criteria**
- Embedded language
- Communication pipes
- Cast-in-place objects
- Fabric formed climbers
- Cast objects
- Moss / Textures
- Embossed textures
- Polished / finished
- Recessed textures

**Visualization**
- Social / Audio
- Extrusions
- Cast-in-place

**Material / Use**
- Social / audio
- Extrusions
- Cast-in-place

**Visual Connection to Others**
- Multiple opportunities are provided within the spaces provided.

**Movement + Use**
- Social / Audio
- Extrusions
- Cast-in-place

**Perception Influencing Fantasy**
- Through sectional variation, the activities of each group will weave together through ideas of movement and multi-sensory ability. The lofted variation will also encourage endless exploration and levels of spatial perception.

**Design Studio**
- Imagination + Adaptation
- Structure or path can become fantastical play.
- A child can interpret the space to fulfill their own imagination within designed spaces.

**Performance Criteria Applied**
- Movement + Use
- Texture + Tactility

**Site Plan**
- N. 1.01
- N. 2.01
- N. 3.01

**Elevations**
- Med 2-3
- Slow 0-1
- Fast 4-5

**North Wall**
- Child perspective
- Adult perspective

**South Wall**
- Natural barrier
- Difficulty versus speed matrix counter-intuitive to the level of age groups while simultaneously providing a space for appropriate movement.

**Key Notes:**
1. 2" EPS High Density Milling Foam (Effective Thickness at 1"
2. 3/4" CDX Forming Plywood
3. 2 X 2" Wailing Lumber (Specific to Form Ties)
4. 2" Thick Spacer (Plywood)
5. Corner Condition: See Detail Sheets
6. Climbing Wall: See W 3.00 Sheets
7. 2" High Density Milling Foam (Effective Thickness at 2"
8. 8" Thick Spacer (Plywood)

**Natural Barriers**
- Created for appropriate threshold:
- When combined with typical over/under/up/down movements, thresholds present constant change when combined with typical over/under/up/down movements.

**Environmental Perception**
- Exaggerated, stimulating the ability to create experiences relating to the child's environment.
- Views of a child's environment can become visual and auditory.
- Environment on a child's level reveals enough to build imagination + adaptation.

**Material / Use**
- Social / Audio
- Extrusions
- Cast-in-place