A Prescription for play



Why play fosters social and cognitive development

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The Brookings Institution
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June, 2018

What do you hear?



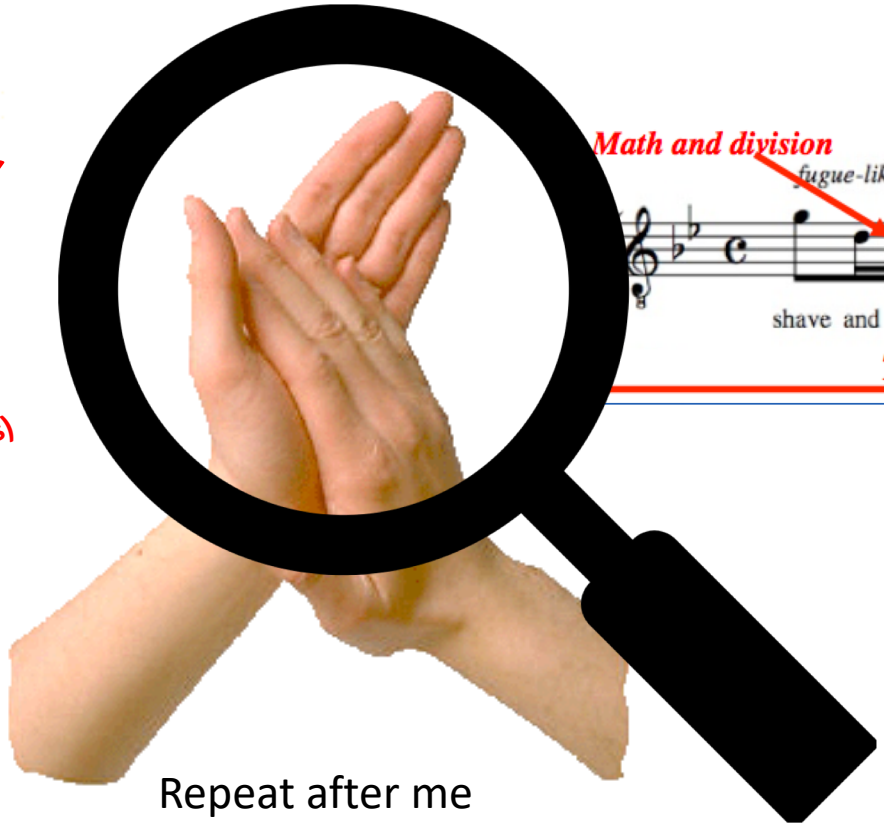
Repeat after me

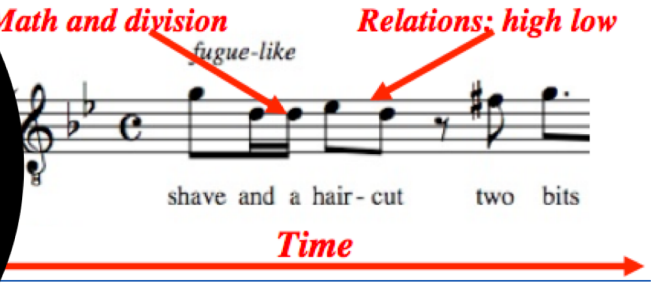
Now change the lens

Working memory

Patterns

Collaboration (Following others)





Repeat after me

What's going on here?



Change the lens!



It is time to change the lens….



- On the way we think about learning and education – in and out of school

- On the way that educators, parents, and policy makers think about the social and academic value of an education fostered through play and active learning!

Why do we need a change?

- In the last two decades children have lost 8 hours of free play per week

- 30,000 schools in the United States have eliminated recess to make time for more academic study.

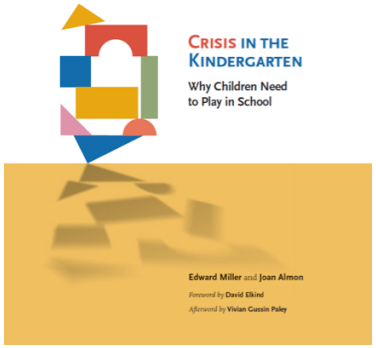
Elkind, (2008) *Greater Good*



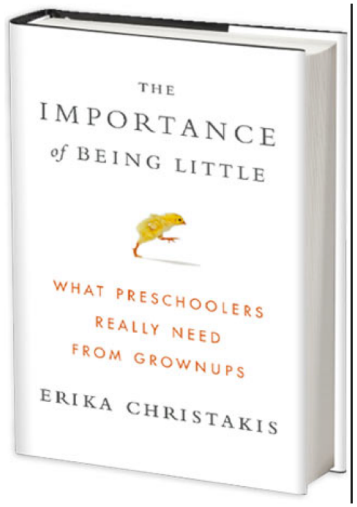
Photo - Tim Gill

New findings support the relative extinction of play

- The Alliance for Childhood 2009 survey of 142 NY classrooms and 112 LA classrooms found that
  - 25% of teachers had no time for play
  - 61% of NY teachers have no choice time
  - 79% of NY teachers do test preparation every day



- Bassok et al., (2016) report that kindergarten really is the new first grade!
  - 80% of teachers say K-garten children should be reading – up 50% from 1998
  - Time for arts? Down 16%
  - Testing? Up. 29% test children at least once a month



These issues and more prompted a response from from the American Academy of Pediatricians

In 2006 titled: ***The Importance of Play in Promoting Healthy Child Development and Maintaining Strong Parent-Child Bonds*** they wrote,

> These guidelines are written in response to the multiple forces challenging play. The overriding premise is that play is essential to the cognitive, physical, social, and emotional well-being of children and youth.

Spearheaded by Dr. Michael Yogman
The forthcoming AAP report…





Speaks to the cognitive and social advantages of play and playful learning while at the same time, suggesting that pediatricians offer **prescriptions for play**!

A talk in 3 parts

- Defining play
  - Free play and guided play
- The advantages of play
  - Play and social learning (executive function)
  - Play and cognition
- Play works for all ages and settings
  - Playing at home
  - Playing at school
  - Playing in the community

A talk in 3 parts

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Defining play

FREE PLAY

whether with objects, fantasy and make believe, or physical, is 1) fun, 2) active 3) has no extrinsic goals, 4) interative, 5) meaningful, 6) often, though not always, socially interactive, 7) can contain a certain element of make-believe

(Hirsh-Pasek et al., 2009; Garvey, 1977; Hirsh-Pasek & Golinkoff, 2003; Christie & Johnsen, 1983;LEGO, 2017)



And Guided play



A planned play environment, enriched with objects/toys that provide experiential learning opportunities, infused with curricular content (Berger, 2008), Think Museums or Montessori classrooms.

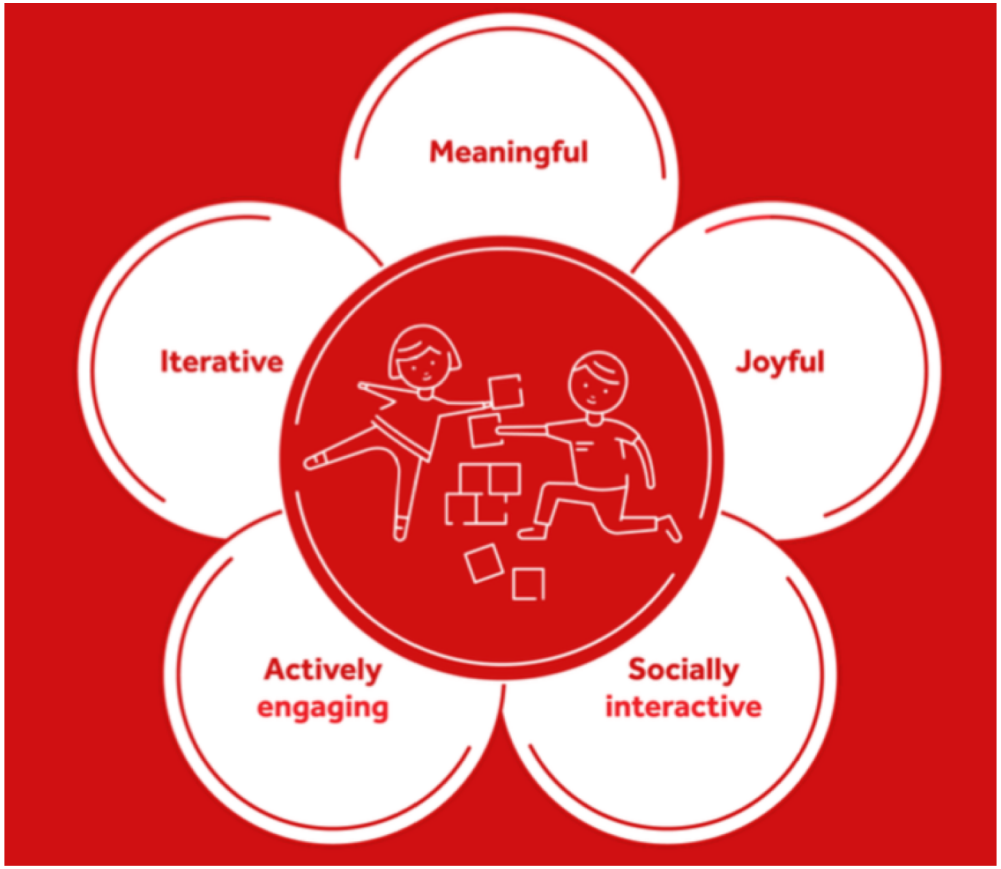
Adults enhancing children's exploration and learning through:

- co-playing with children
- intentional learning objectives
- asking open-ended questions
- suggesting ways to explore materials

Fisher et al., 2011; Hirsh-Pasek et al, 2009; Hirsh-Pasek & Golinkoff, in press; Weisberg, Hirsh & Pasek & Golinkoff, 2015; Weisberg et al., 2016

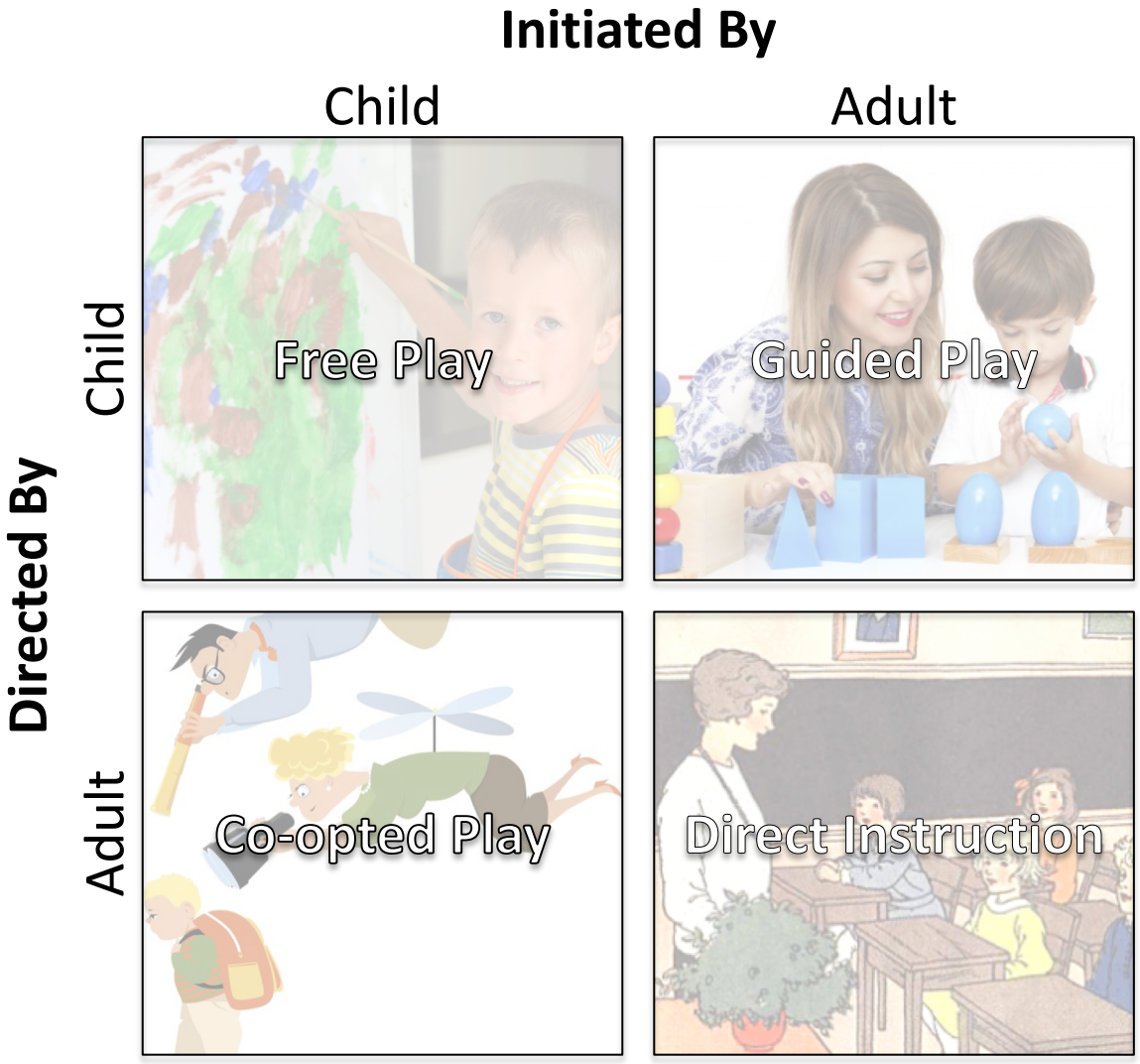
Together
Free and Guided play = playful learning

which has the following characteristics



From a white paper that just published with the LEGO Foundation, derived from Hirsh-Pasek, Zosh et al, 2015

Playful Learning



And research suggests that play and playful learning enhances **social regulation** (collaboration); **language and literacy** (communication); and **STEM** (content learning), and **hypothesis testing** (critical thinking), among others

In fact a new consensus report from Phillips et al., 2017 suggests that preschool classrooms should "teach" using a playful learning approach



- *Far from the "drill and kill" methods justifiably admonished by child development experts, successful evidence-based, skill-focused curricula* ***embed learning in playful preschool activities****, including story-book reading, games, art, and discovery activities that are conducted in both small and large group contexts and grounded in a sound developmental framework… These curricula provide teachers with lesson plans to follow in which playful activities are strategically organized to present children with learning opportunities that are focused, sequential and cumulative.* p. 39

A talk in 3 parts

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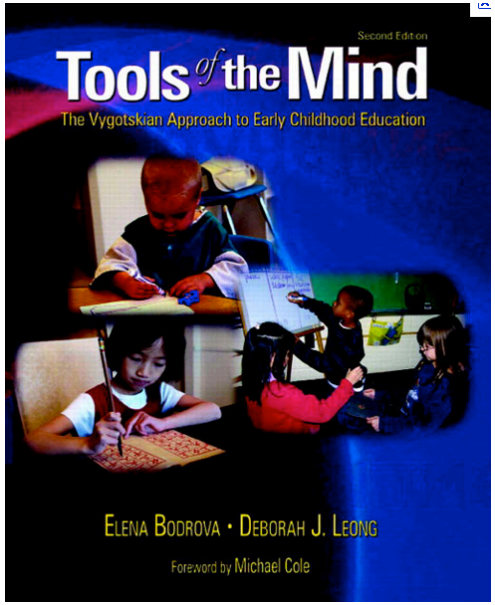
Play and social regulation

Those all important executive function skills

- Inhibition - impulse and emotion control
- Cognitive flexibility - attention
- Working memory
- Socially responsible behavior
- Planning

(Bronson, 2001; Kopp, 1991; Rothbart & Bates, 2006)

Tools of the Mind as a key example of playful learning



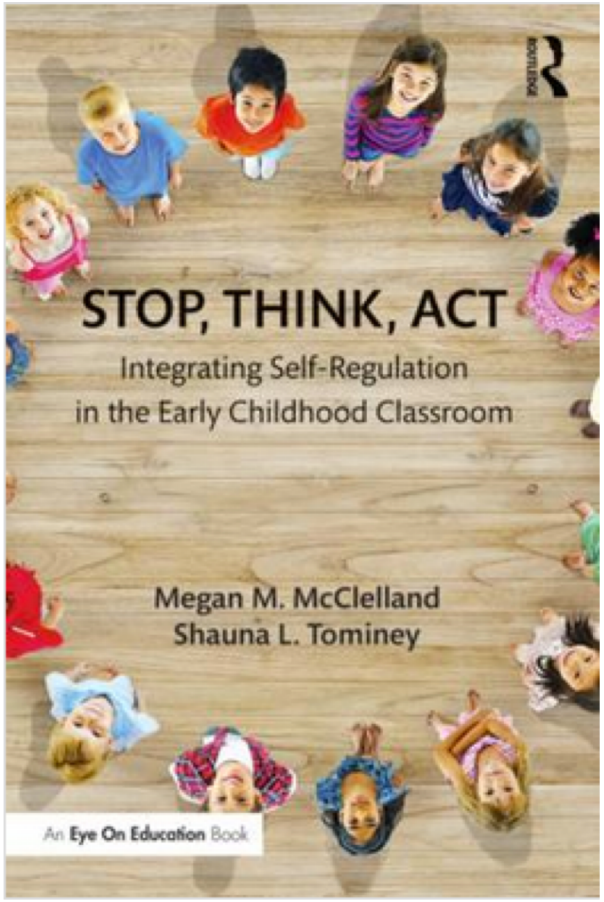


When children engage in playful learning throughout the school day – on quite well designed tasks, their EF and social regulation go up as does their outcomes on standard tests.

(Bodrova & Leong, 2006, Diamond et al., 2011; Blair & Raver, 2015;
but see Thal, 2012 ,Lillard et al., 2012)

Megan McClelland's classroom games for social regulation get similar results





- **Conducting an Orchestra**

  Every child use a musical instrument. The circle leader used a drum stick as a conducting baton. When the conductor waved the baton, children played their instruments. When the conductor put the baton down, children stopped.

- **Drum Beats**

  Teachers used drum beats to represent different actions that children can do while sitting (e.g., clapping or stomping) or while moving around the room (e.g., walking or dancing). For example, children walked quickly to fast drumming, slowly to slow drumming, and froze when the drumming stopped

Playful learning and cognitive skills: Literacy



Telling stories

Singing songs

Dialogical reading

Engaging conversations

Dramatic play (Roskos & Christie, 2013)

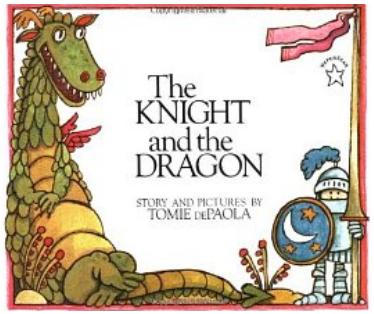
A now classic paper by Lillard et al., 2012 suggests language and reading outcomes are the strongest examples of where even free play encourages development

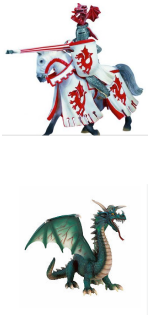
Our current research (with Dickinson and Golinkoff) is asking how playful learning can increase vocabulary in low income children!



Photo from Sheryl Ann Crawford

Adult reads children a book like the Knight and the Dragon while highlighting new words (e.g., galloping, shield)





Free play

Directed play

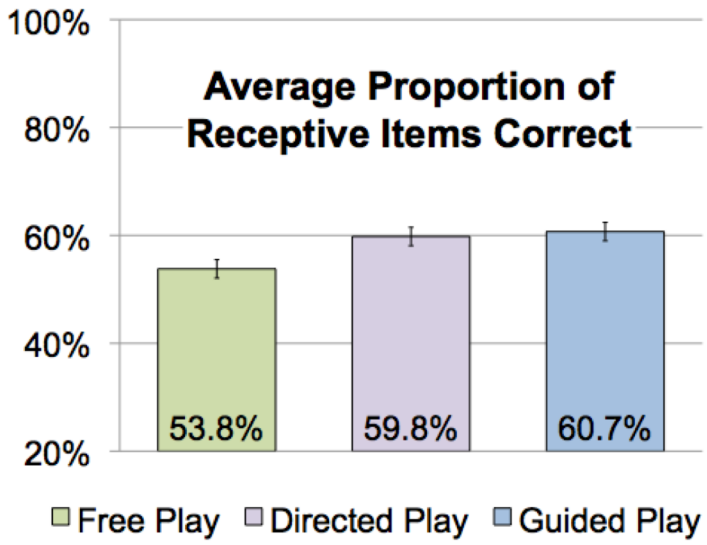
Guided play

No focus, dialogue; meaning-making; child initiated and directed

Targeted focus with more closed questions; adult initiated and directed, meaning-making

Targeted focus with more open ended questions; adult initiated, child directed, meaning-making

Results?



Children did better post that pre in all conditions

Adult supported play was better than free play in all conditions!

Book reading + adult supported play was also better than book reading plus fun flash cards!

Bottom line? When there is a learning goal – adult supported play (guided or directed) helps children learn!

Weisberg et al., 2015; Taub et al., in press

Then we asked whether game play might help readers learn vocabulary better than flashcards and – it did!

How to Play: Teacher says, "First, spin the spinner and move to the first square that is the same color. Then, I am going to read you the word that you landed on and a question about that word. Next, your neighbor gets a turn. Let's play Snakes & Ladders!"

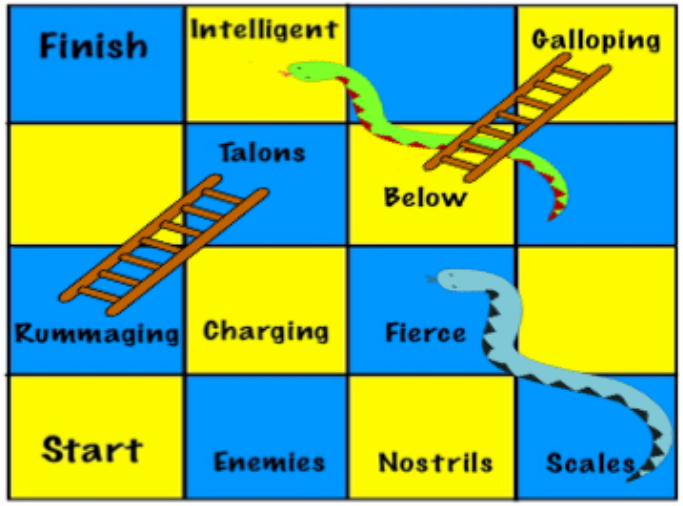
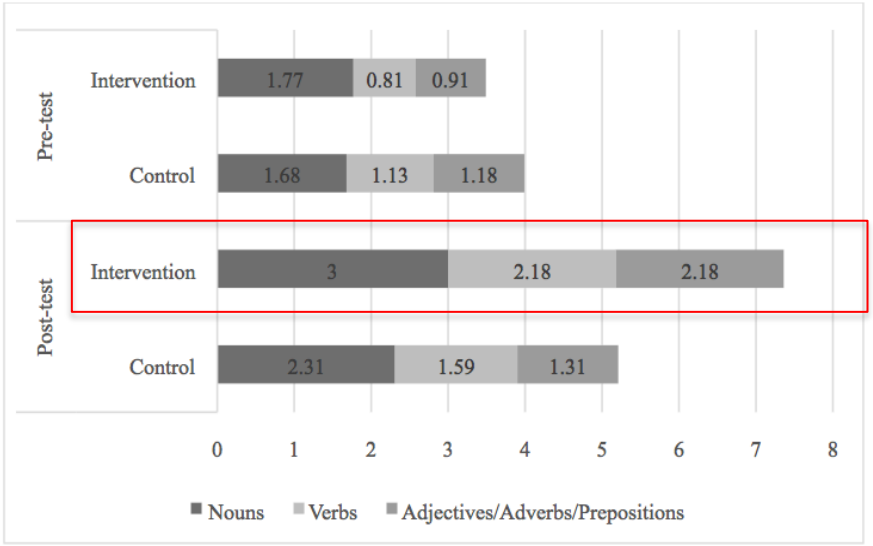


Figure B3. Sample *Snakes & Ladders* game board



Hassinger-Das, Ridge, Golinkoff & Hirsh-Pasek, 2016

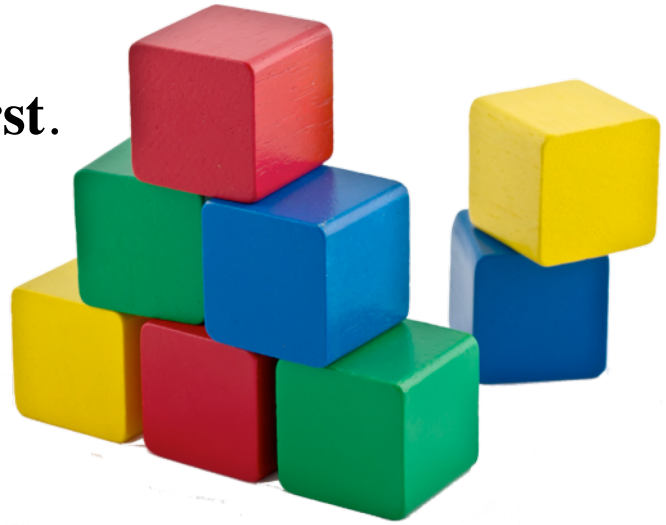
What about STEM??

- Playing with blocks and puzzles
- Playing board games
  - Ramani & Siegler, 2008; Ramani, Siegler & Hitti 2012
- Planting a class garden
- Lemonade stand



In our research, we studied **Block Play** to ask if it might build better spatial language and math outcomes

- 3-to 5-year-olds participated with a parent.
- They differed on which condition they had **first**.



- For their **first** experience they either had:
  - **Free play**

    "Here are some blocks, do what you will"
  - **Guided play**

    "Can you build a heliport/ garage using these pictures?"
  - **Preassembled play**

    "Here's a heliport! Have fun"

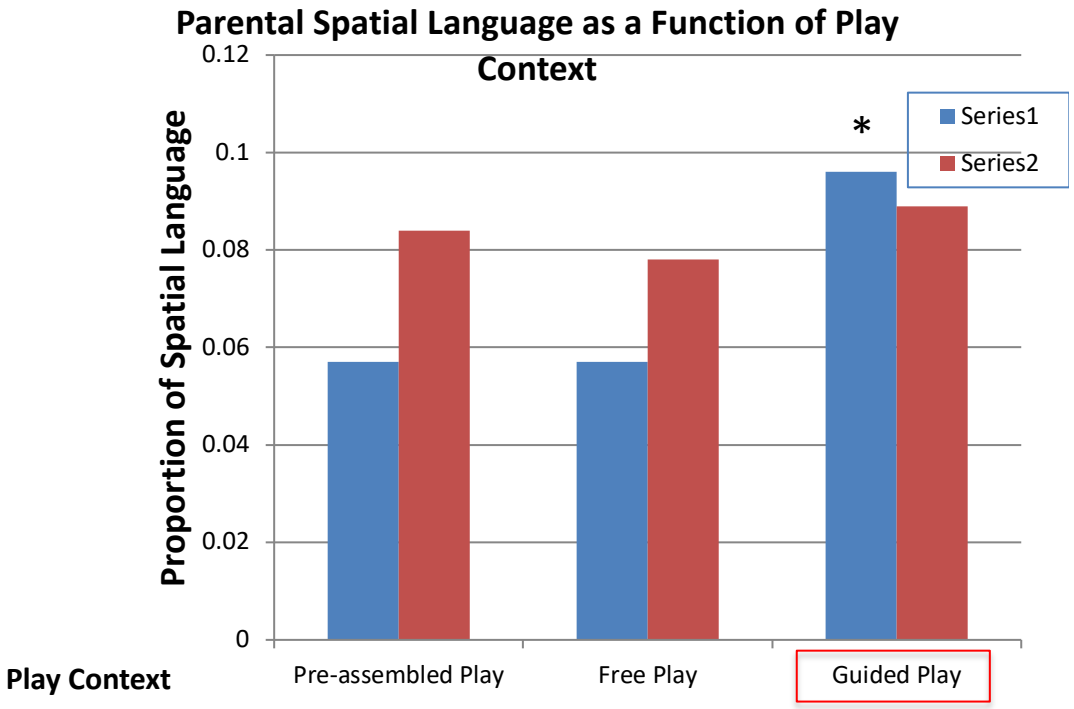
All groups had GUIDED PLAY for their second experience.

"Can you build a heliport/ garage using these pictures?"

- **So what condition prompted the most spatial language from parents?** Words like *above, around, over, through*….
  - Preassembled play?
  - Free play?
  - Guided Play?

- And did playing with blocks offer any advantage for hearing spatial language over playing with other toys?

GUIDED PLAY WINS!



First, the play context makes a difference!

In guided play, 10% or 1 in 10 words were spatial

Second, block play made a difference

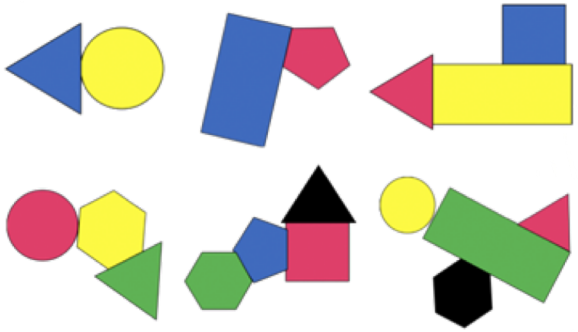
In non-block play contexts, parents use only 3 to 6% of spatial terms

Why should we care?

Because spatial language and spatial play relate…

- to later spatial ability!
- and later math ability!

2-D Test of Spatial Ability (TOSA)



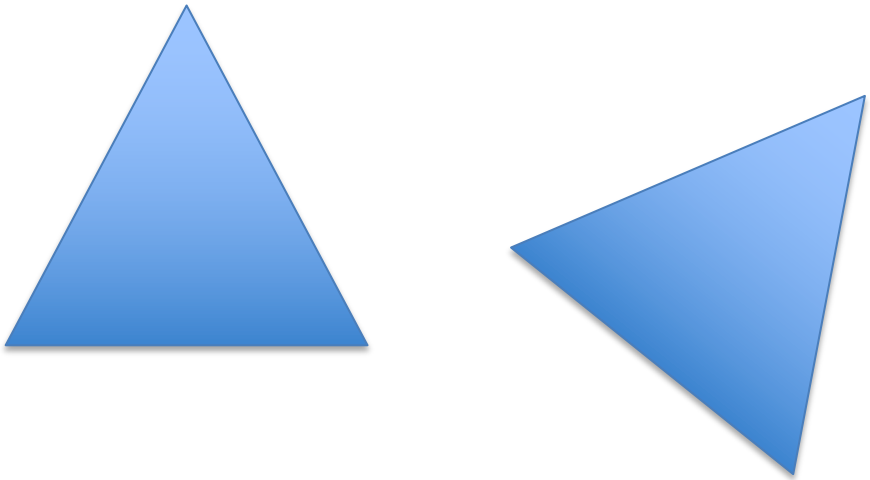
3-D Test of Spatial Ability (TOSA)



Verdine, B., Golinkoff, R., Hirsh-Pasek, K, Newcombe, N., Filipowicz, A. & Chang, A. (2014); Verdine, Golinkoff, Hirsh-Pasek & Newcombe, 2017

As another example in STEM, we looked at kiddy geometry and asked….

Whether guided play might be a better way to learn than is direct instruction or free, exploratory play for learning shape *concepts (triangles, rectangles, pentagons, hexagons)*?



Fisher, K., Hirsh-Pasek, K, Newcombe, N & Golinkoff, R.M. (2013) *Child Development*

Three conditions were designed to teach children the criterial features of a shape…..



Guided Play (+ DI, + AE): Children were taught rule-based classification systems for shapes in a playful, exploratory manner (they were "detectives" discovering the secret of the shapes)

Direct Instruction (- DI, - AE): Children were taught rule-based classification systems for shapes in a passive learning manner (children *watched* the experimenter act as a detective discovering the secret of the shapes)

Exploratory/Free Play (- DI, +AE) : Children played with shape cut-outs (same as training cards) and wax sticks for approximately the same amount of time as the training

Shape Sorting Task

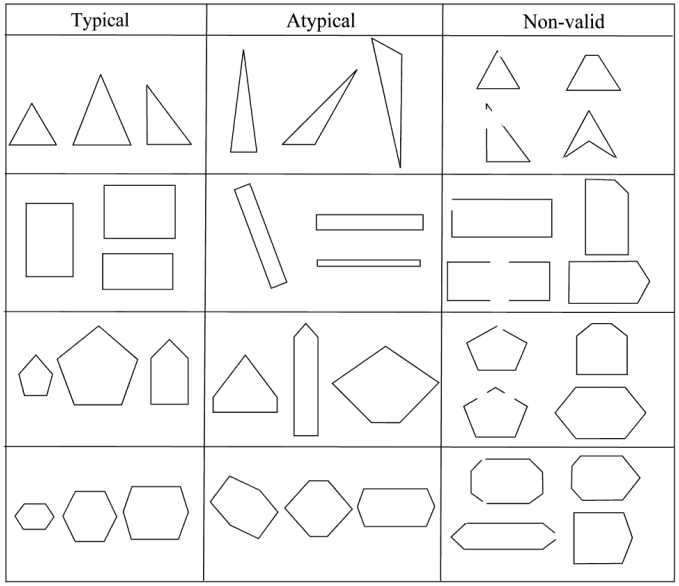


Shape Cards:

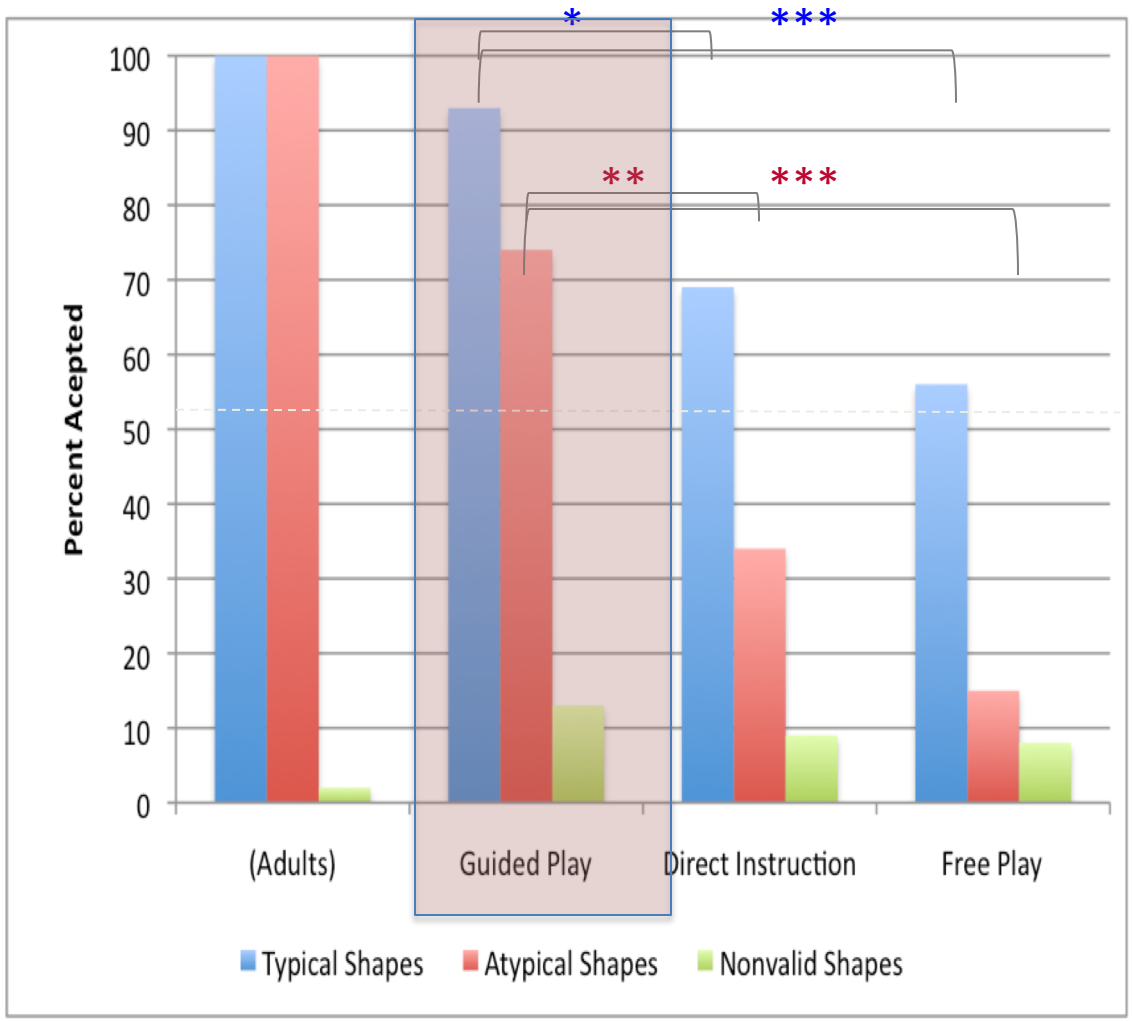
40 cards, 10 per shape (3 typical, 3 atypical, 4 non-valid)

Procedure:

- Children introduced to "Leelu the Picky Ladybug" who only liked REAL shapes.
- She needed help sorting some shape cards she found (40 cards; 10 per shape).
- 'Real' shapes were placed in her ladybug box, while 'fake' shapes were thrown in a trashcan



They learn best in guided play!



Acceptance rates of typical, atypical, and non-valid shapes (sorted as 'real shapes') by group.
NOTE: Adult data was not collected for this study. Data is presented for comparison only.
** p < .05, ** p < .01, *** p < .001*

Why might playful learning support learning?

Some hypotheses

Big Idea 1: It involves "active, engaged, meaningful and socially interactive learning" and that is how humans learn best! (Chi, 2009; Hirsh-Pasek et al., 2015)

Big Idea 2: Guided play is like "constrained tinkering" that lessens the "noise" and allows adults to bring a learning goal. Offers a chance for hypothesis testing. (Parish-Morris et al., 2014; Tare et al., 2010; Uttal et al., 1997)

Big Idea 3: Guided play creates a positive disposition for learning and exploration (Weisberg, Hirsh-Pasek, Golinkoff & McCandless, 2014; Weisberg, Hirsh-Pasek et al., 2016).

Big Idea 4: Playful learning is joyful and positive emotions help children learn!

Big Idea 5: Play allows us to build the suite of skills needed for success (the 6Cs)



LEVEL	Collaboration	Communication	Content	Critical Thinking	Creative Innovation	Confidence
4	Building it together	Tell a joint story	Expertise	Evidence	Vision	Dare to fail
3	Back and forth	Dialogue	Making connections	Opinions	Voice	Calculated risks
2	Side by side	Show and tell	Wide breadth/ Shallow understanding	Truths differ	Means-end	Where do I stand?
1	On my own	Raw emotion	Early learning/ Situation specific	Seeing is believing	Experimentation	Barrel on

Golinkoff & Hirsh-Pasek, 2016

And these collective skills (what we call the 6Cs)

Form the foundation for learning

The New York Times BEST SELLER



In Parenting and Education

Golinkoff & Hirsh-Pasek, 2016

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Encouraging play at home: The play prescription



If communities and physicians support playful learning and encourage families to play, we think it will make a difference. Create a *Reach out and Read* for play.

Dr. Alan Mendelsohn's work takes a step in this direction, helping parents learn how to play



OBJECTIVE: The goal of this study was to determine what effects pediatric primary care interventions, focused on promotion of positive parenting through reading aloud and play, have on the socioemotional development of toddlers from low-income, primarily immigrant households. (Weisleder et al., 2016 *Pediatrics*)

Random controlled experiments at well-visits for low-income families. Uses pediatric primary care as part of a comprehensive public health strategy to prevent adverse child development outcomes.

https://youtu.be/fdk2AmRcG6Y

Play at school for all ages!

Examples from early childhood
K-12
And college!

Ramps and Pathways



A set of integrated physical science and engineering experiences that involve inclined planes and the movement of objects.



www.rampsandpathways.org

Single Track Ramps



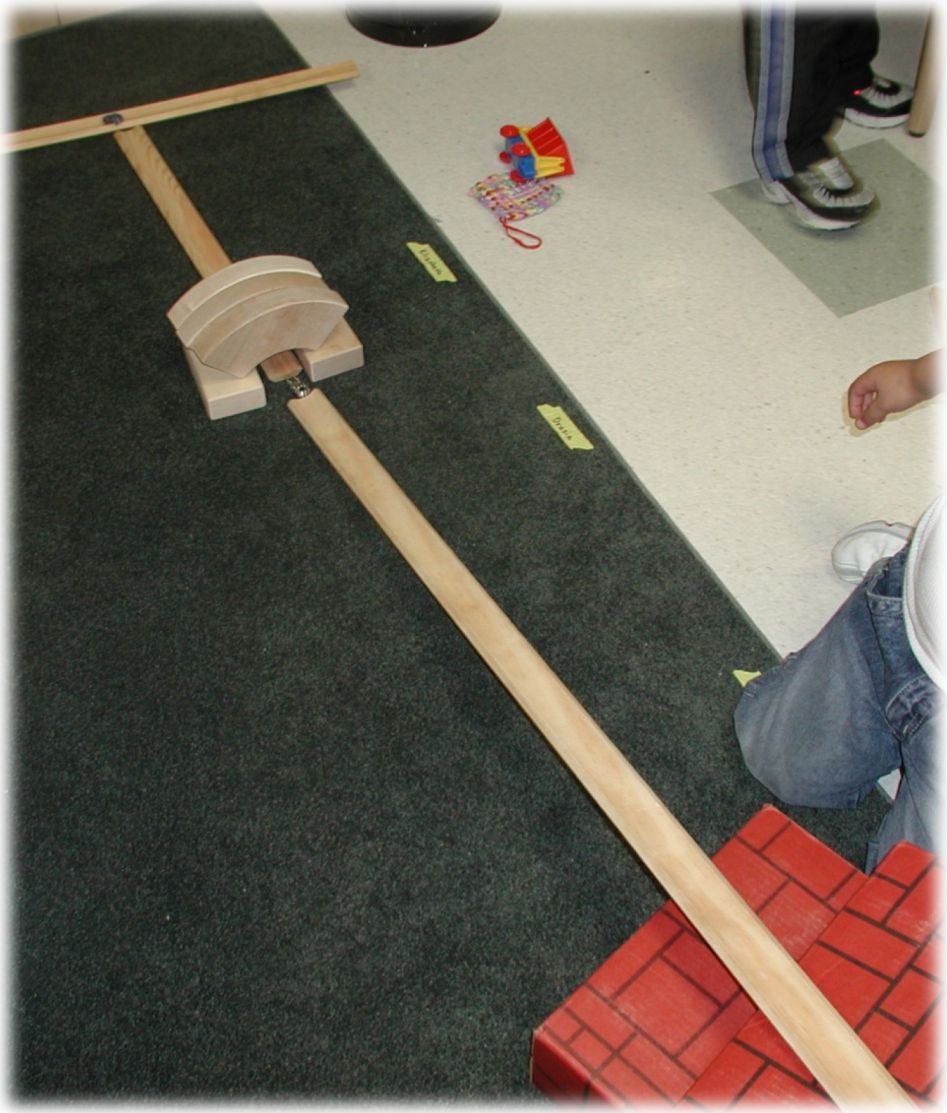


Long Straight Ramps









Gaps between ramp segments

Walls for the Pathway



Tunnels



Catching the Marble



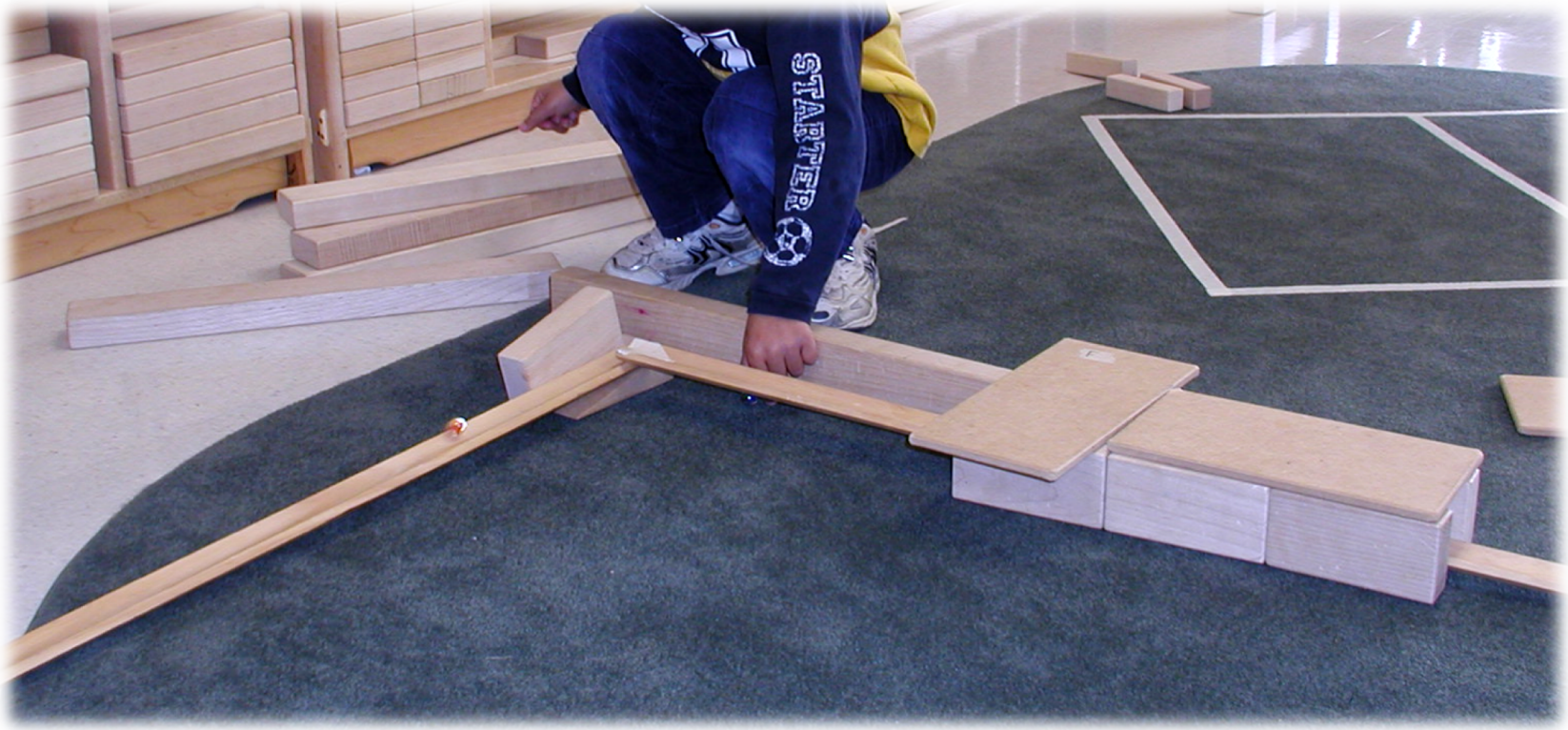


Unstable vs. Stable Foundation

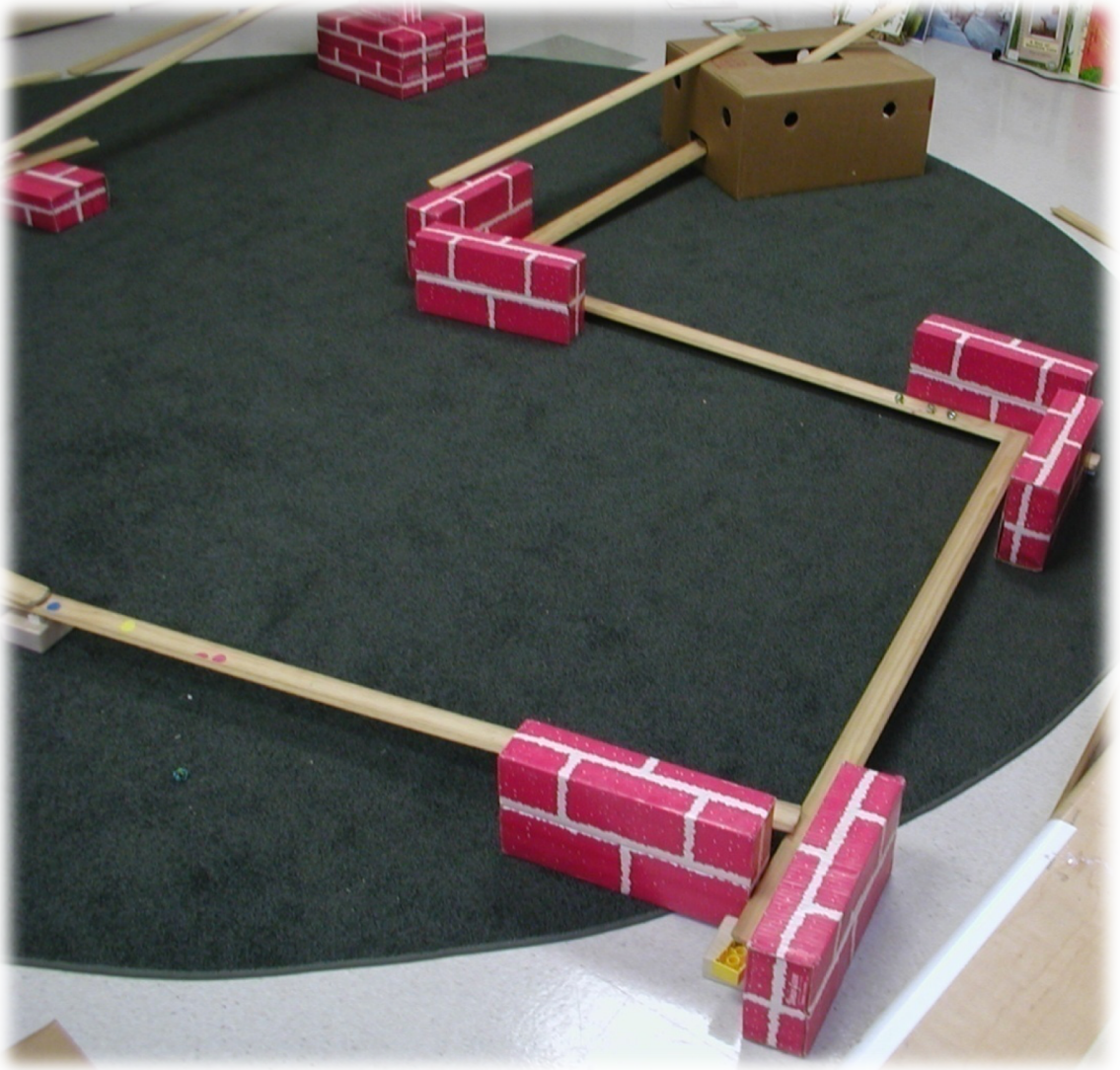




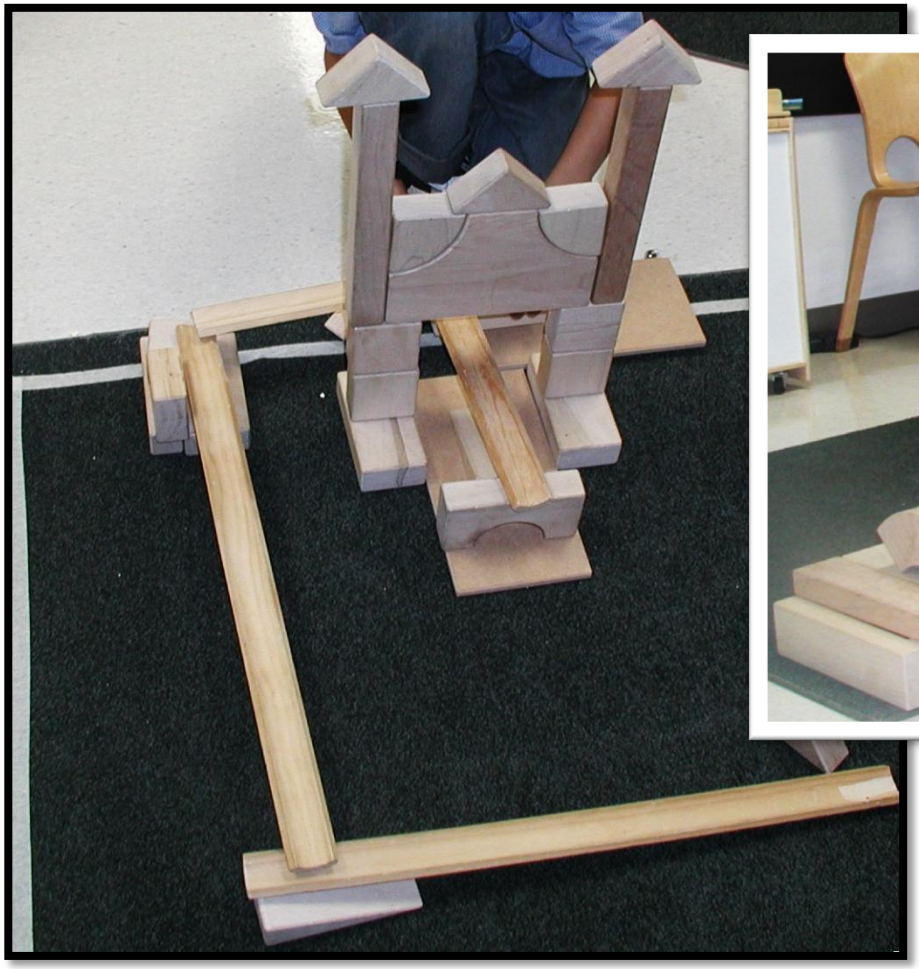
Right Angle Corner

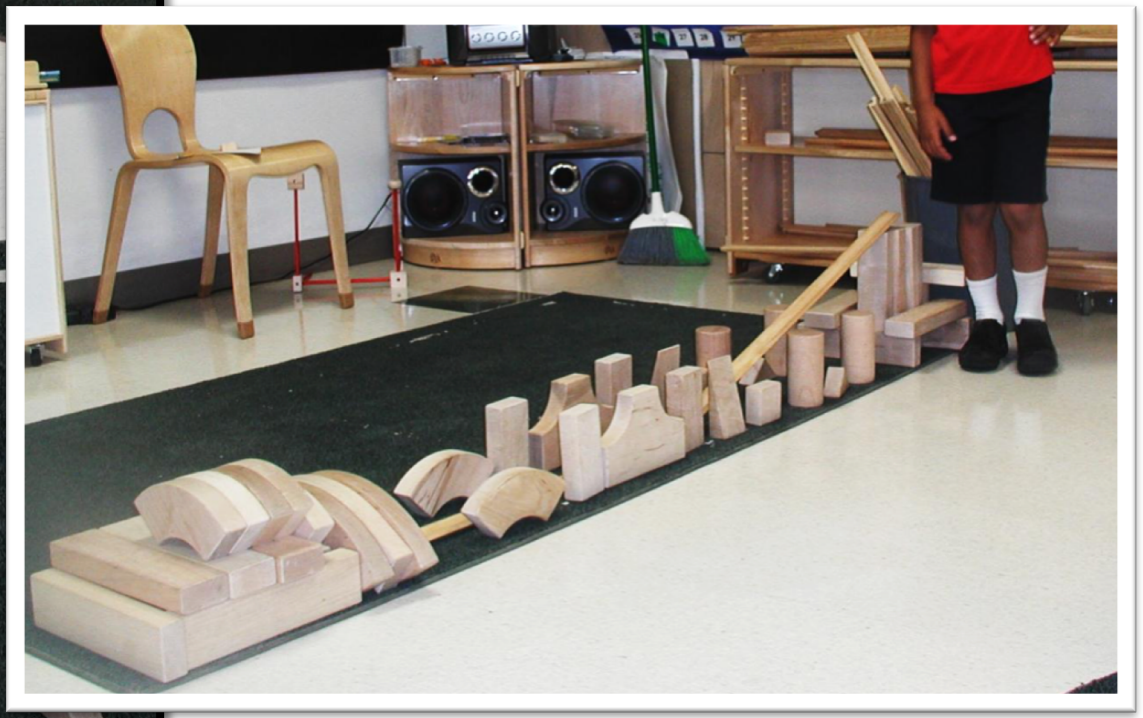


Multiple Corners

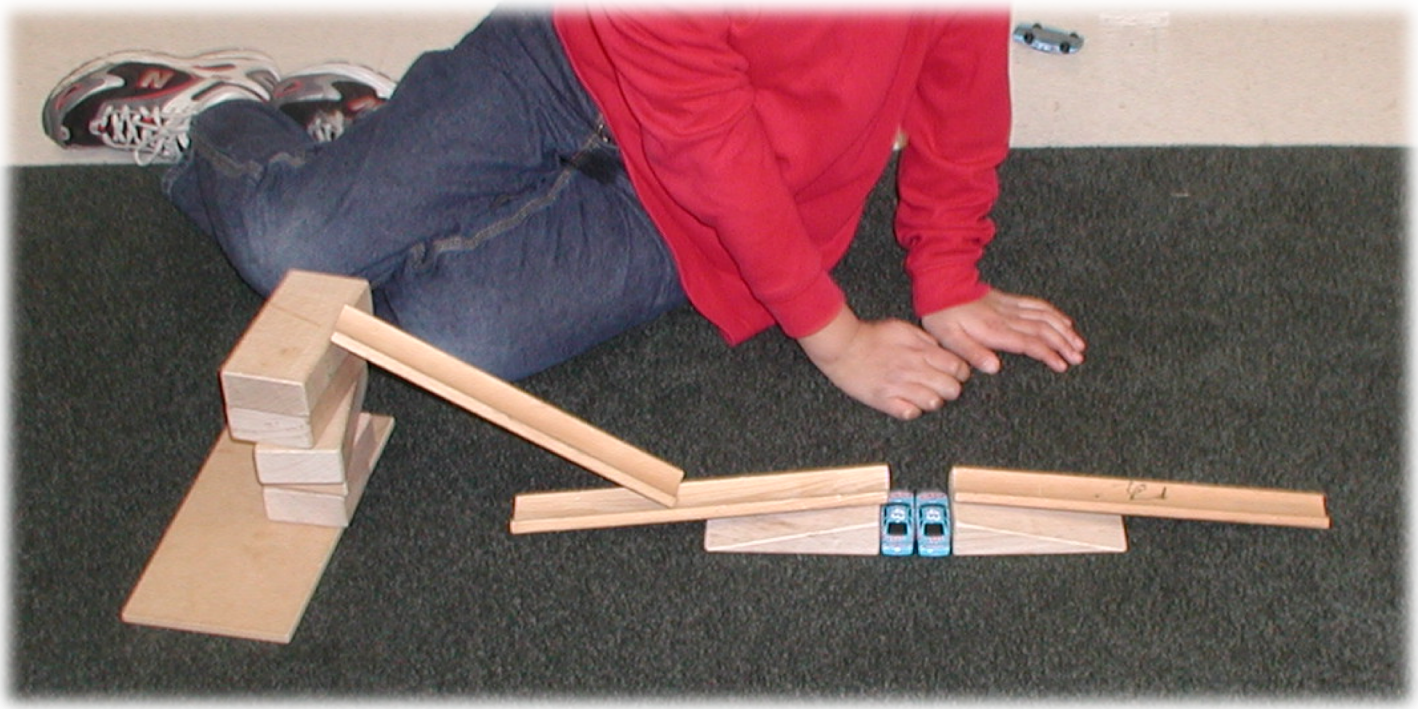


Non-Essential Structures





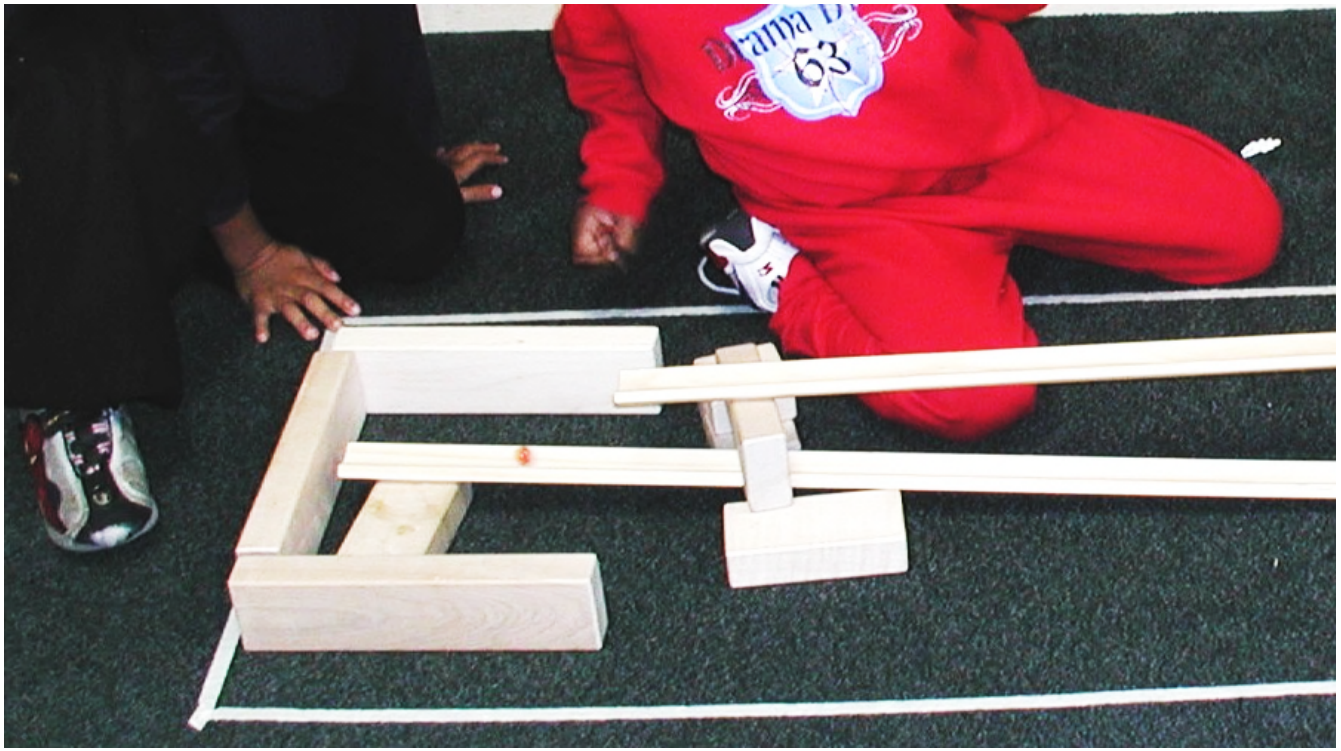
Jumps



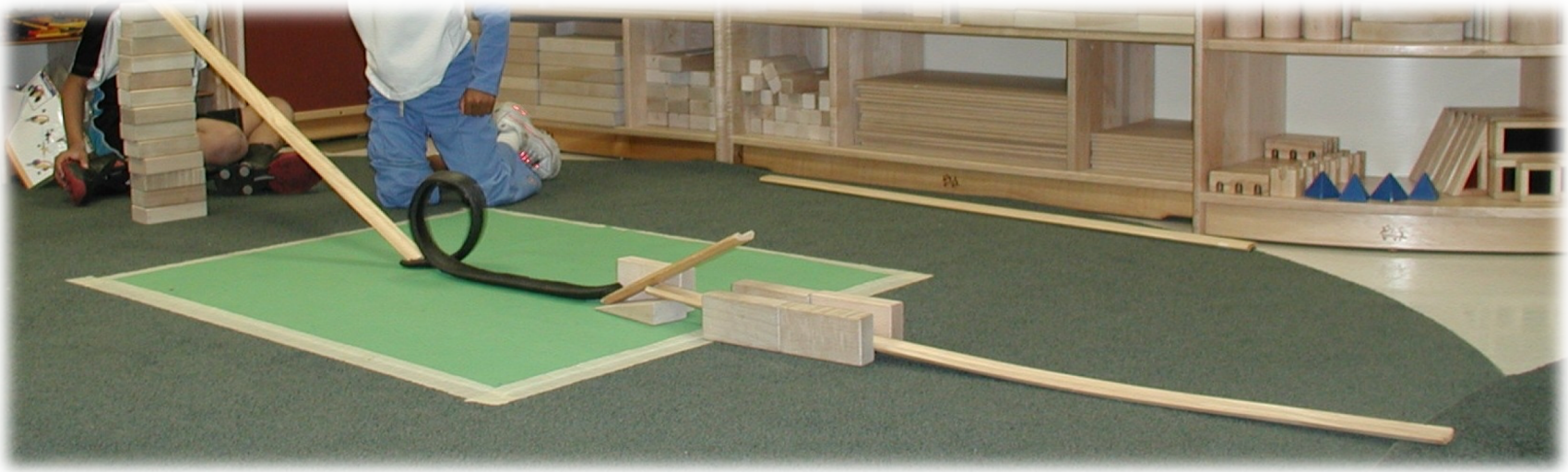
Longer Jumps



Drops



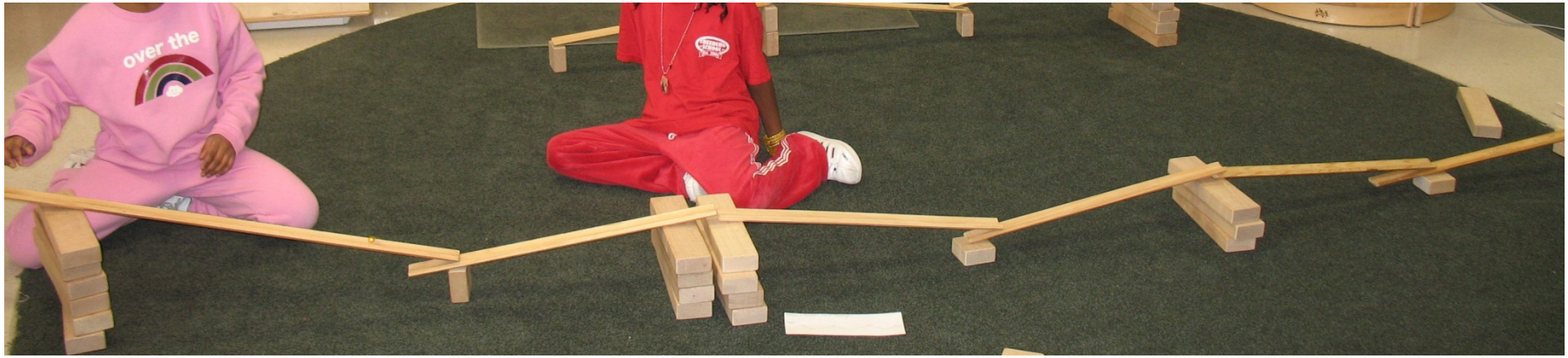
Loops



Hills



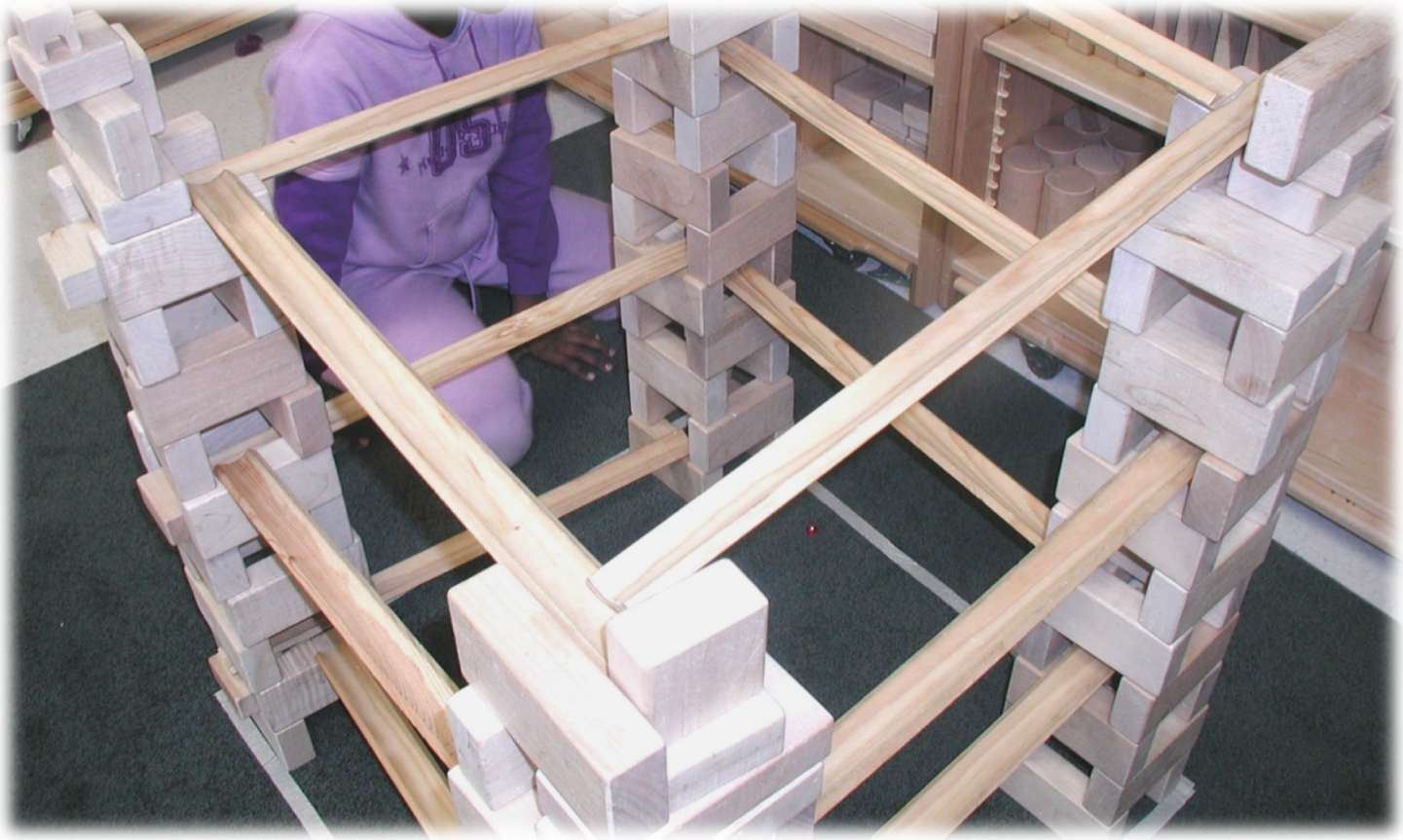
Multiple Hills



Multi-tiered Structure



Spiral Path



Godfrey Lee K-12 School District

- Theme-based playful learning

Godfrey-Lee Public Schools

- Winter Olympics Theme (elementary)

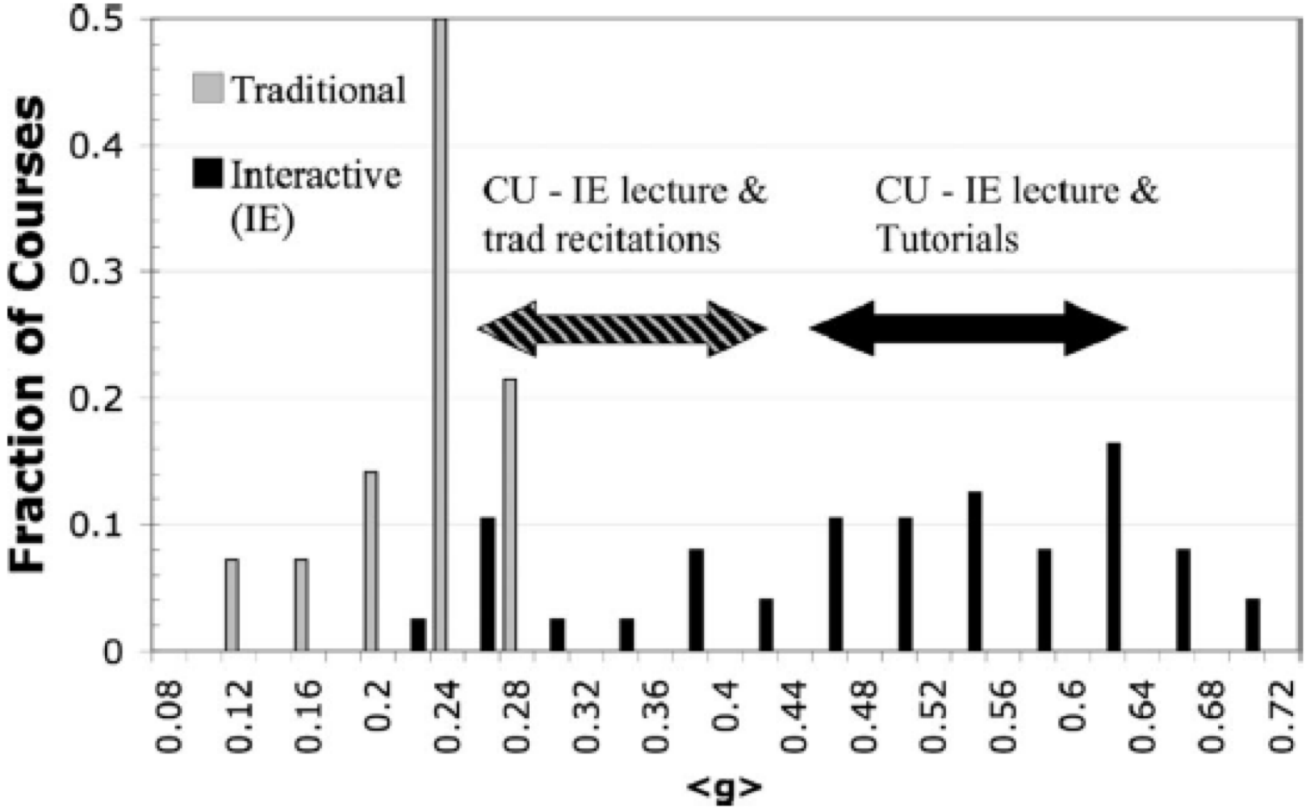
https://www.facebook.com/1474677512801804/videos/2063312280604988/

- Hamilton inspired history class (high school)

https://www.facebook.com/LeeRebels/videos/10155512701817546/?q=godfrey-lee%20public%20schools

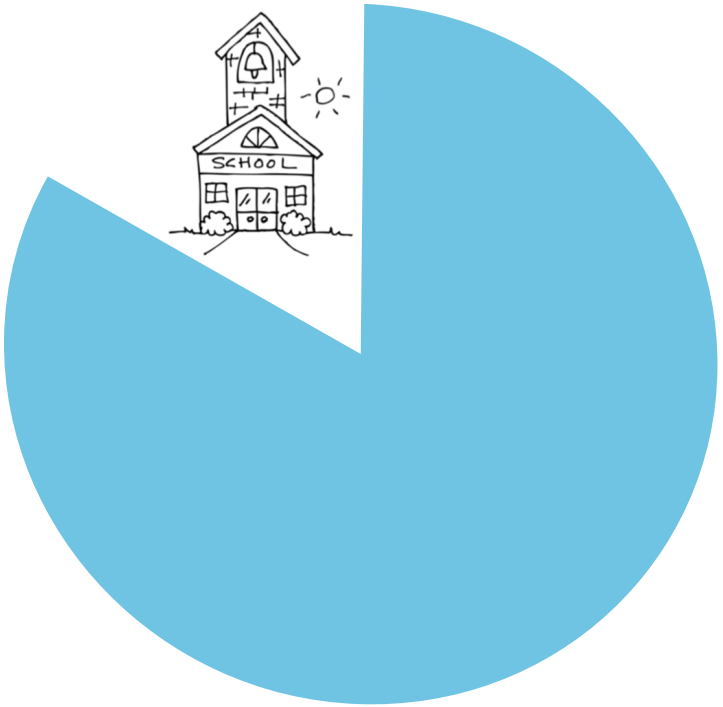
Undergraduate Physics

On average undergrads learn less than 25% of basic concepts that they didn't already know



Traditional lecture vs. Interactive Engagement (Pollock & Finklestein, 2008)

What about creating playful opportunities in communities?

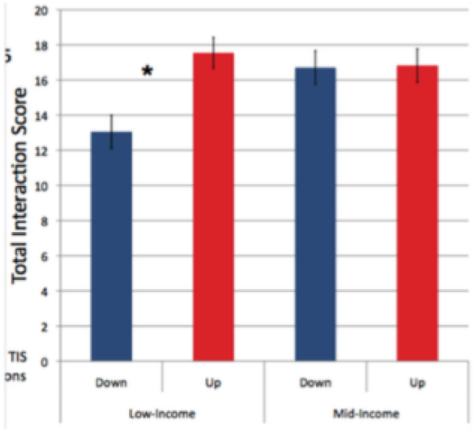


Did you know that children spend only 20% of their waking time in school? What are they doing with the other 80%? Can we create playful learning opportunities to leapfrog learning?

Example 1: How we might enhance learning in everyday “trapped” spaces like supermarkets?

In low-income neighborhoods we increased parent to child language by 33%!

(Ridge, Hirsh-Pasek & Golinkoff, 2015)

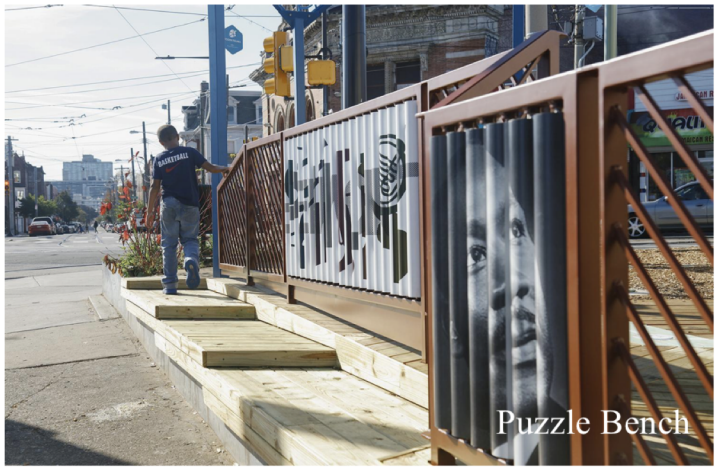






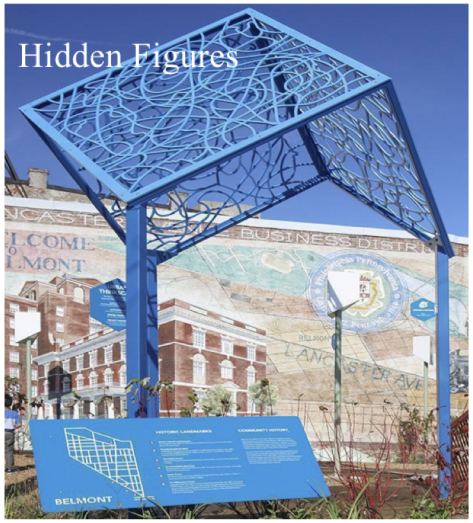
https://drive.google.com/file/d/1Ypylose7buj4f_MTcEGa1ucDjGg0lr4p/view

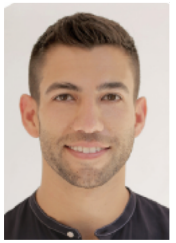
Example 2: Urban Thinkscape – Transforming a bus stop and adjacent plot of land











Itai Palti



Brenna Hassinger-Das

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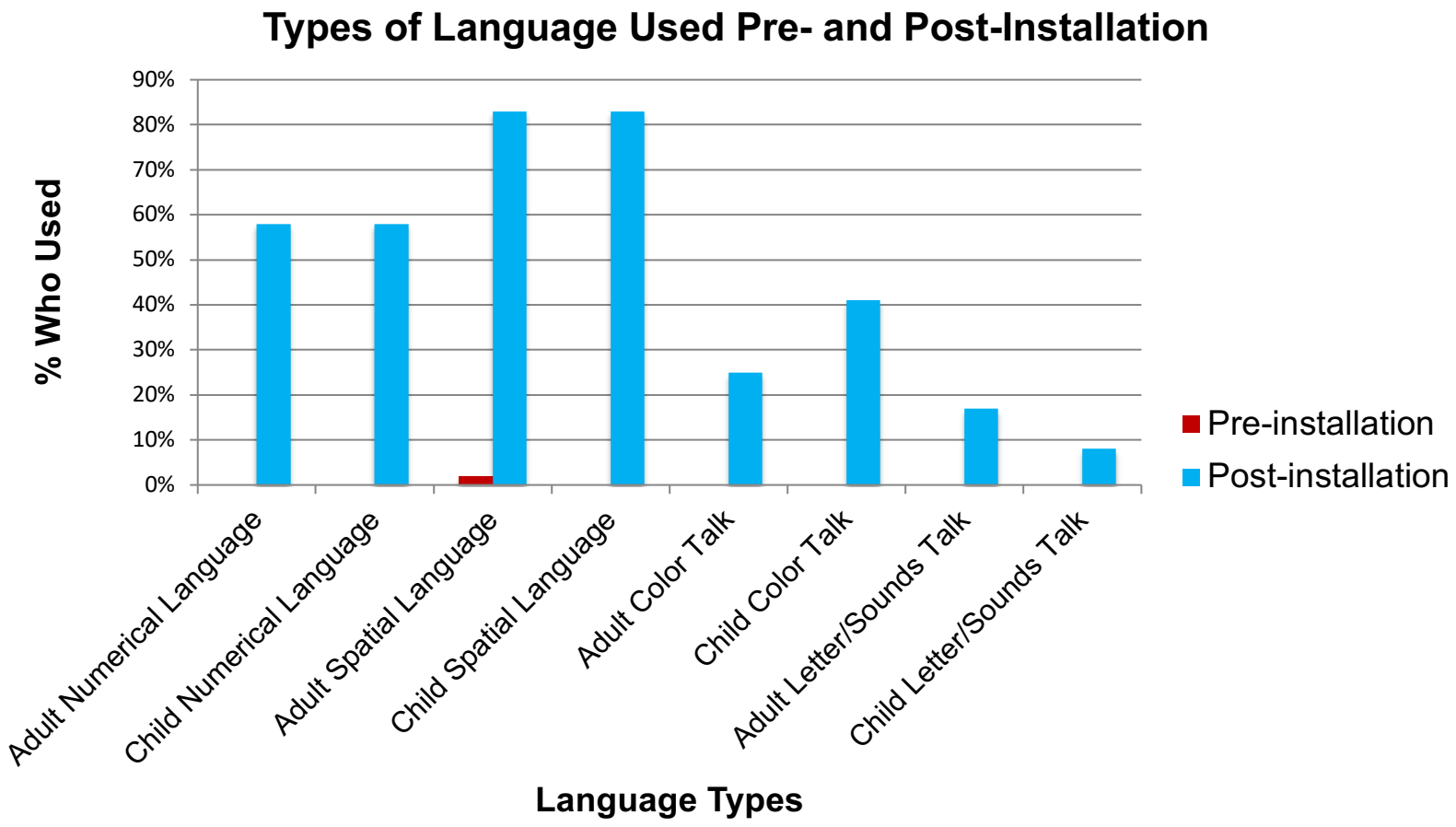
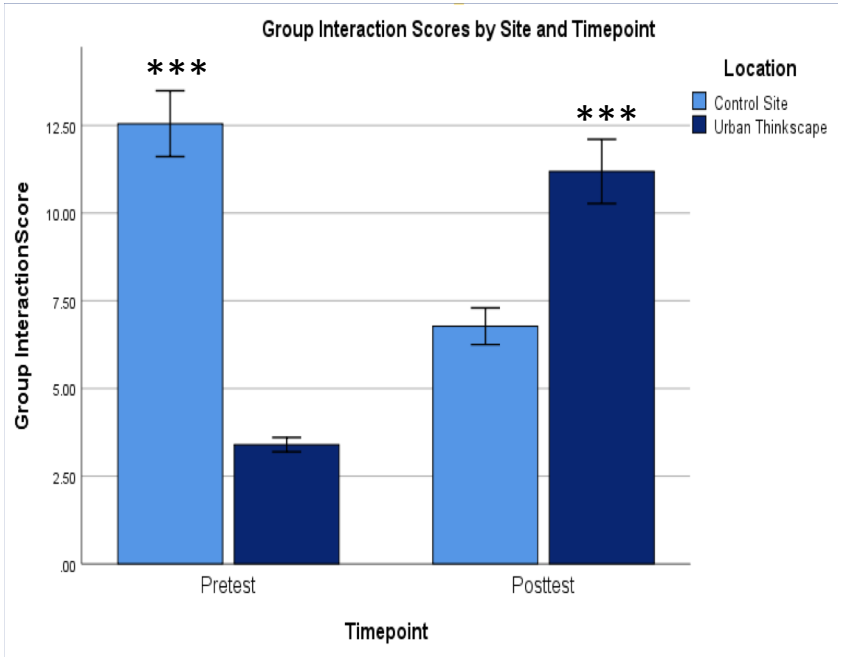
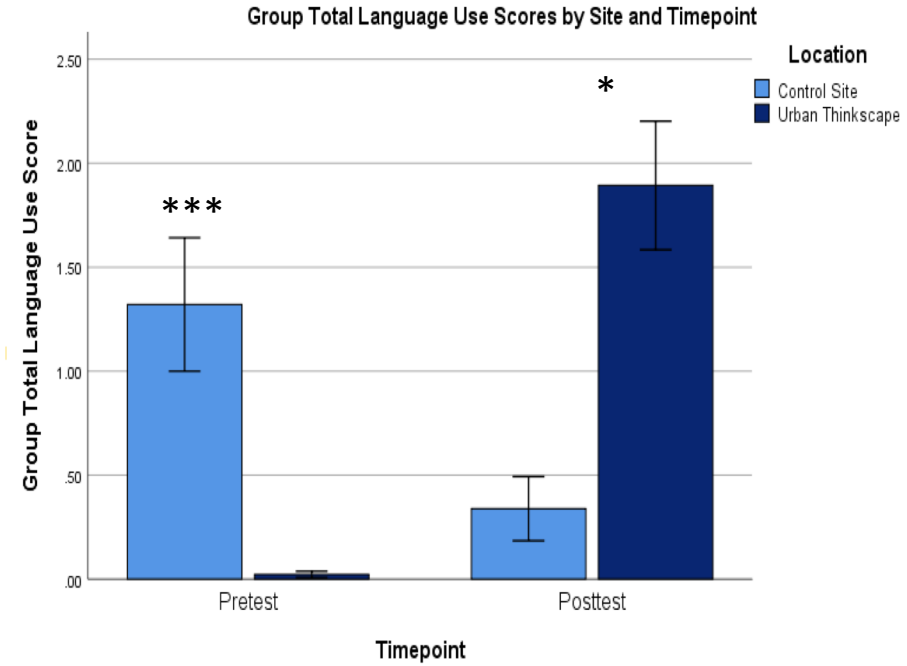
https://developingchild.harvard.edu/innovation-application/innovation-in-action/urban-thinkscape/

URBAN THINKSCAPE
TYPES OF LANGUAGE USED

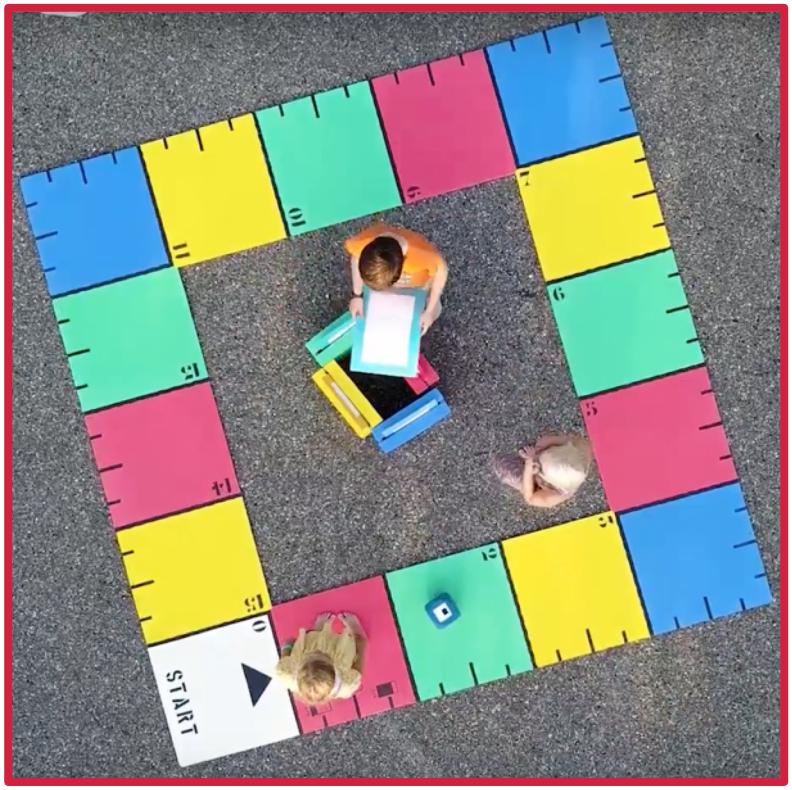


URBAN THINKSCAPE VS. CONTROL
OVERALL SOCIAL INTERACTION





Example 3: Parkopolis -The Life Size Board Game designed to develop STEM skills





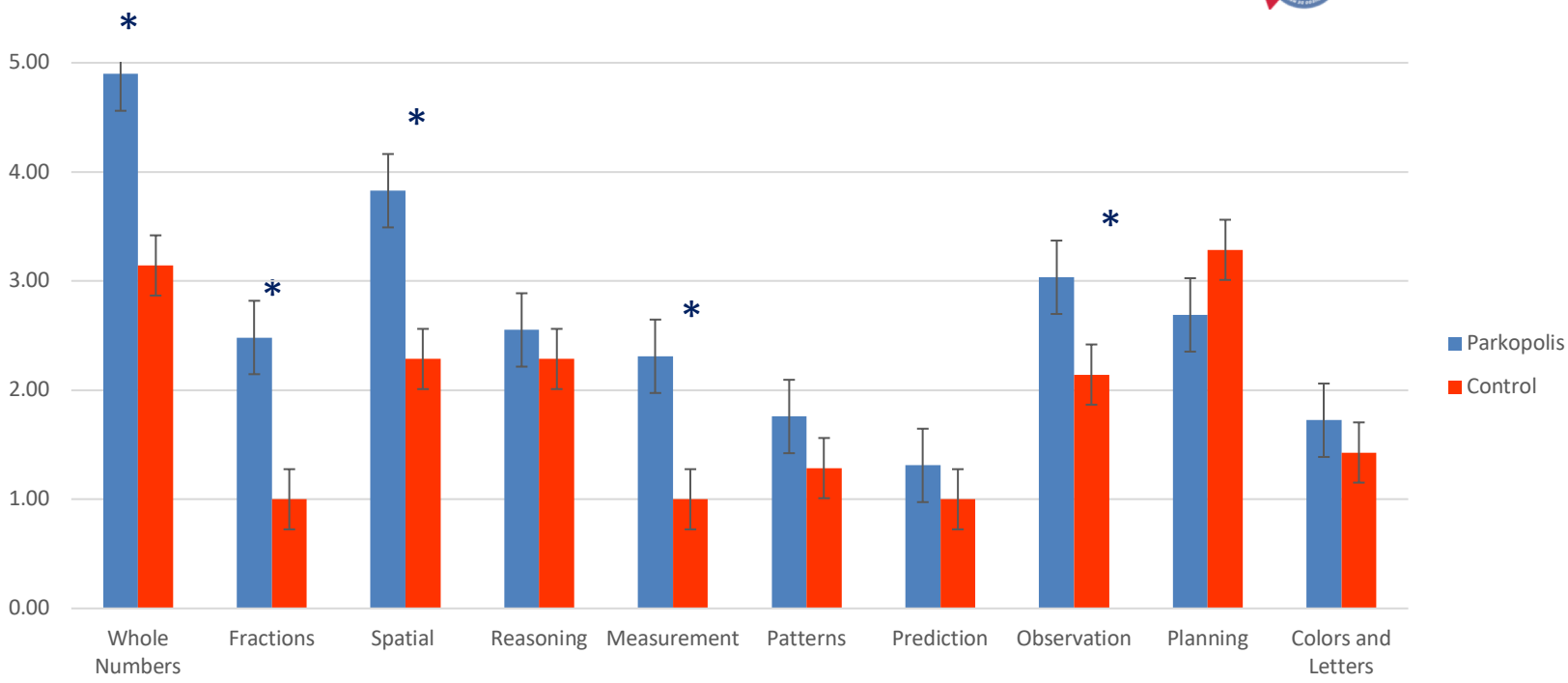




https://youtu.be/R4G2eqcVzv8

Children were engaged, showed greater confidence and persistence when faced with difficult problems.

PARKOPOLIS
LANGUAGE USE



Children used more whole number, fraction, spatial, measurement, and observation language.

Parkopolis at The Please Touch Museum




Park

Example 4: Playbrary

Architect: Studio Ludo & Digsau

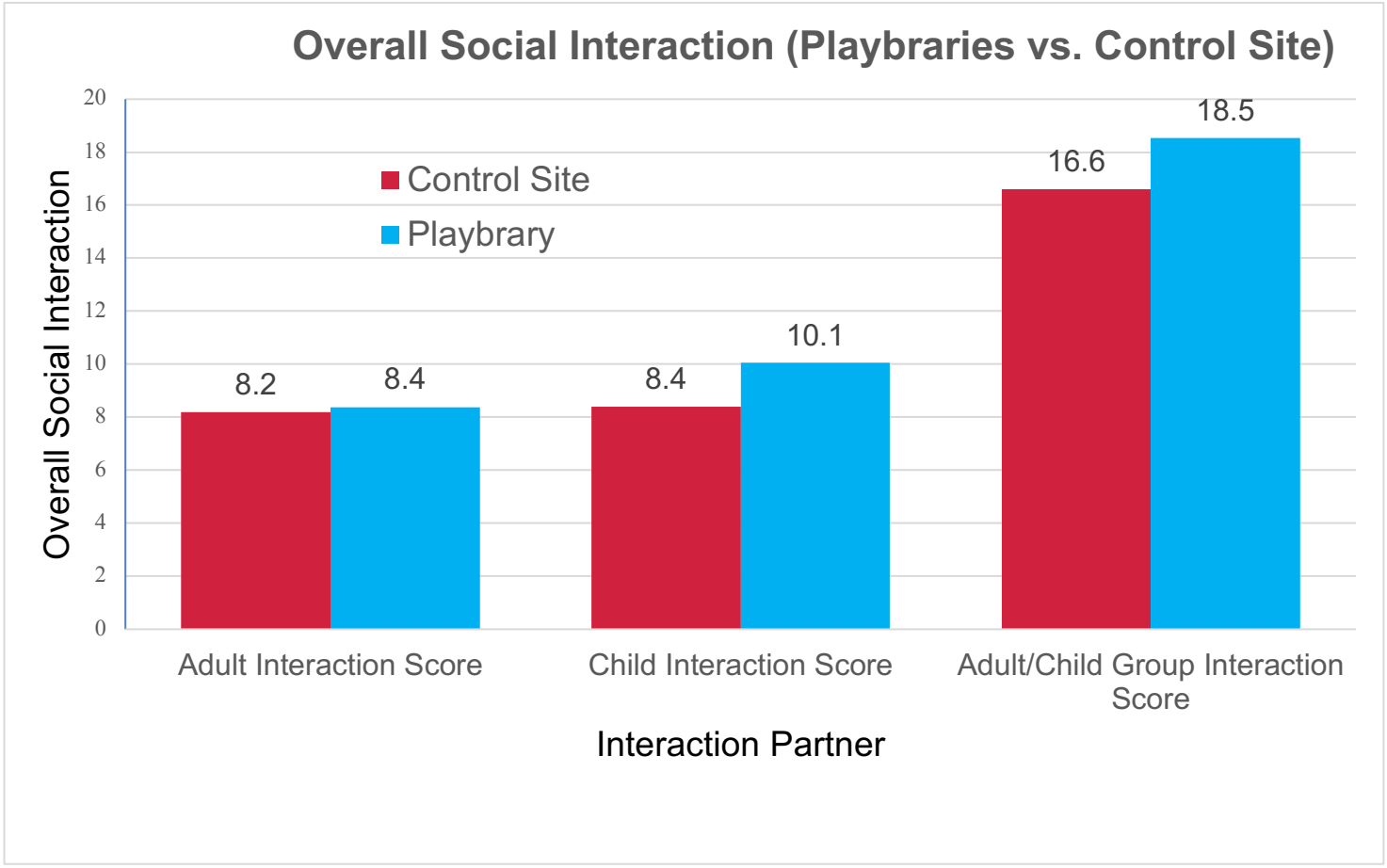




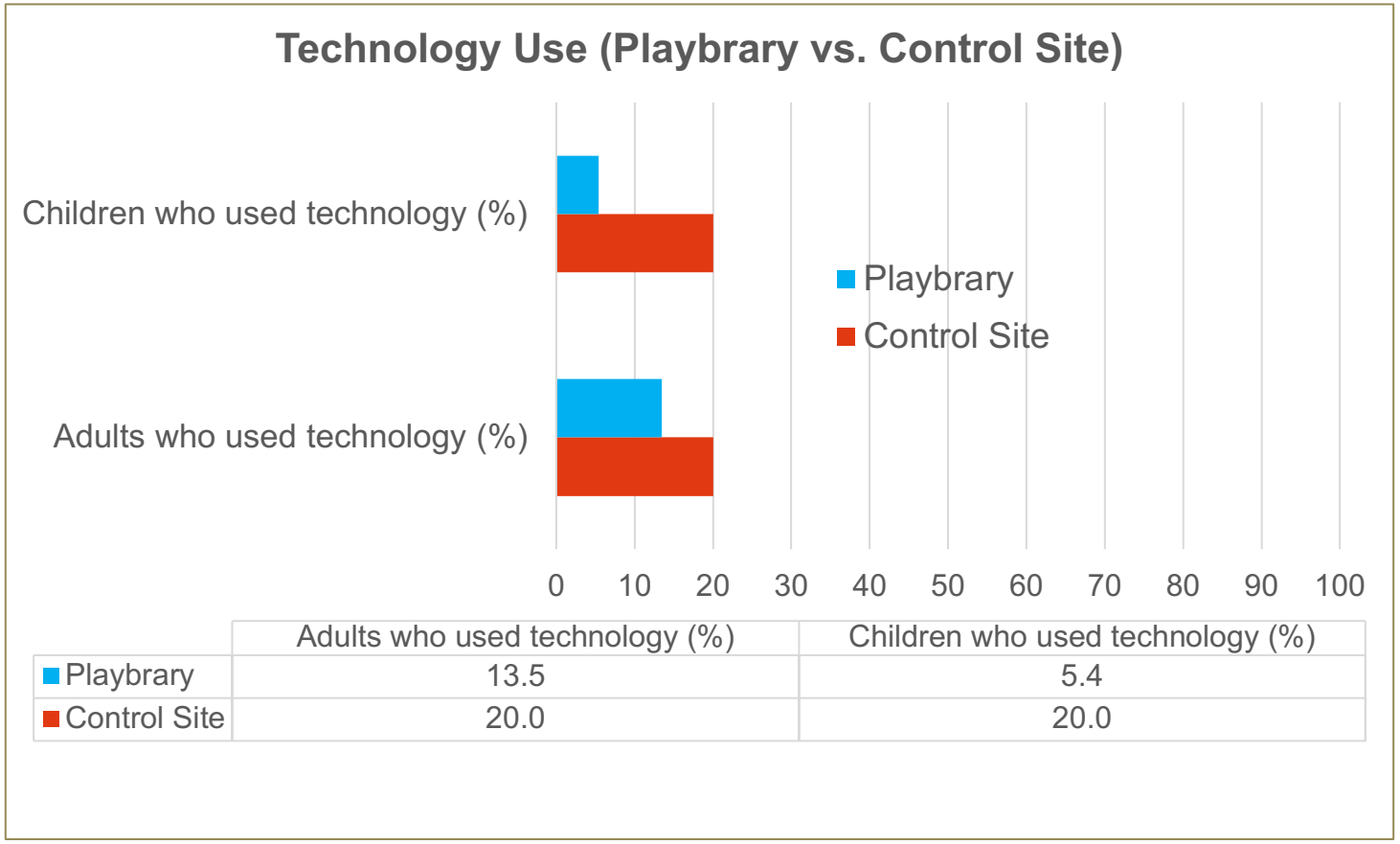




PLAYBRARY
SOCIAL INTERACTION



PLAYBRARIES
TECHNOLOGY USE



	Adults who used technology (%)	Children who used technology (%)
Playbrary	13.5	5.4
Control Site	20.0	20.0

Together, these projects form Learning Landscapes and create the…



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In sum, it might just be time……

To write prescriptions for play!

- Play helps us socialize and learn.
- Play is not the opposite of work. Rather, it encourages the skills that we will need for work.



Thanks to our funders













The most wonderful postdocs, graduate students and undergrads.

And to the families who make the research we do possible!

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