PLAYFUL Learning LANDSCAPES ACTION NETWORK

Transforming community spaces into joyful learning opportunities

www.playfullearninglandscapes.fun

Mission + Vision

Our Mission:

To infuse our neighborhoods with playful learning opportunities that encourage cross-generational interaction and enhance children's cognitive and social development, better preparing them for success in a changing world.

The Vision:

Imagine cities and public spaces where the science of how children learn and develop healthy relationships is built into the very foundations of design – and families and communities are stronger, healthier, and more powerful because they have the confidence and skills they need to forge the futures they want.

What if...

we could transform cities into playful learning centers alive with fun opportunities for children that prepare them for success in a global world?

What if, on any given neighborhood block, we could find kids playing together while building skills in math, science, language, and reading? What if children not only learned "basic" skills – but also learned how to learn – experimenting, taking risks, and gaining confidence by playing in everyday places?

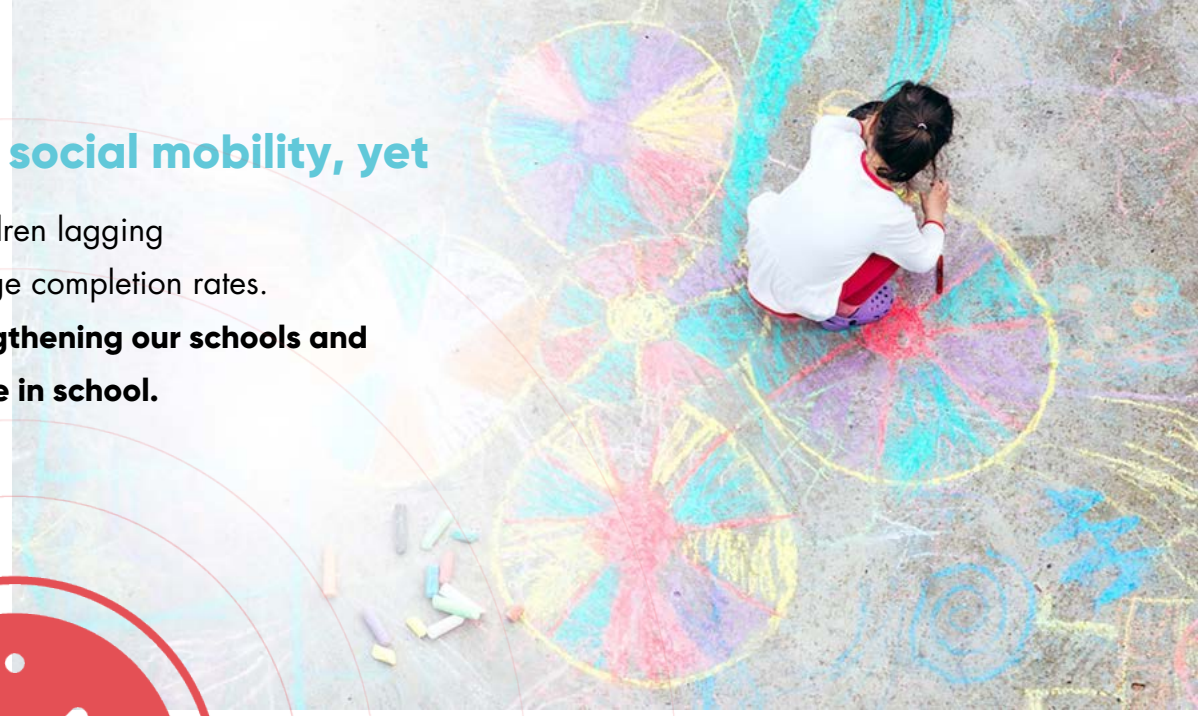
Now more than ever, as we recognize the great disparities along racial and ethnic lines, we need to ensure that all children, and not just some children, have equitable access to critical interventions that will support them now and in the future.

Playful Learning Landscapes

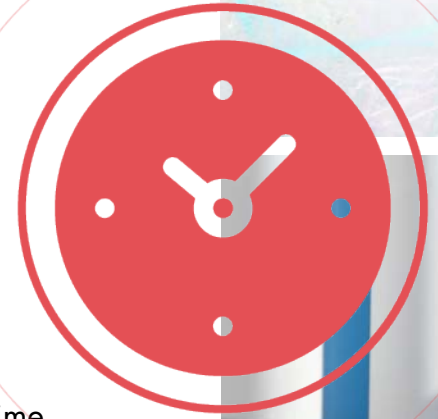
Playful Learning Landscapes applies the science of how children learn to spark interactions with caregivers, other kids, and the environment to increase fundamental learning and skills. A landscape can be any place where a community gathers naturally. A landscape could be a bus stop in a neighborhood, an empty lot, or destinations such as a library, supermarket, hairdresser, or playground. Playful Learning Landscapes integrates playful learning into community spaces to transform social interactions and the physical architecture of the landscape with innovative design.

The challenge: Education is the most powerful engine for social mobility, yet

many families don't have access to high-quality learning opportunities resulting in their children lagging behind in school readiness, poorer academic performances and low high school and college completion rates. Ultimately, this reflects on their ability to find good jobs – fostering a cycle of deficit. **Strengthening our schools and providing quality pre-k education is critical, but children spend only 20% of their time in school.**



Children spend 80% of their time outside the classroom



How amazing would it be if we could maximize the other 80% of a child's time by infusing educational elements into public spaces and reaching families in parks, supermarkets, bus stops, and other places where they regularly go?

Playful Learning Landscapes is an investment in our communities and a promise for greater equity and access for those who have systemically been excluded.

photo: Sahar Coston-Hardy

How to use this Playbook

The Playbook is intended as an introduction to Playful Learning Landscapes. The Playbook is divided into four major sections beginning with the concepts of playful learning through the creation of dynamic playful learning environments.

Keep in mind that future expansions of the playbook will target the specific needs of designers, educators, community organizations, parents, builders and innovators interested in creating playful learning environments.

An important statistic:

By 2050, over 70% of the world's children will live in cities...

It's now more important than ever to help these cities come alive with playful learning opportunities where children and families gather, fostering cognitive and social development, and better preparing them for success in the 21st century.

enter the Playful Learning Landscapes Initiative...

photo: Sahar Coston-Hardy

What is Playful Learning?

Learn more about the concepts of Playful Learning and why it is so important…

photo: Sahar Coston-Hardy

photo: Sahar Coston-Hardy

Defining Playful Learning

Kids learn and develop skills from all kinds of play, but they learn best when learning goals are intentionally integrated into play from the start, and when they are guided by an adult, or the environment itself toward a particular learning goal.

We can think about play as running along a spectrum from free play to instructional games. Evidence suggests that when people have a learning goal that they hope to achieve, guided play is better than free play for achieving learning.

Free Play

TRANSFORMED TO

Playful Learning

Climbing the pole to the playground netting? That's free play.

Add hatch marks with numbers to those same poles and kids talk about how high they climbed – playful learning.

Kids on a playground near a bus stop? Free play.

Add puzzles targeting spatial skills or special hopscotch games that build impulse control and you create playful learning.

Stocking a library with more toys? That encourages free play.

Add tangram blocks that invite families to play with geometric forms and a climbing wall with letters and you get playful learning.

The 5 Principles of How Kids Learn...

Learning can be joyful, stimulating, and fun. Children are naturally curious and love to learn through play! In playful learning, children are in charge and learning is crafted into the environment through the 5 principles of how kids learn.

"The Daisy"

Meaningful: Children learn best when learning has a purpose and connected to something they value. The activity should spark Content, like math, science, or literacy, or build Critical Thinking or Creativity.

Joyful: Joy heightens children's interest and motivation for learning. Playful Learning activities should offer something new every time kids play it.

Socially Interactive: Working together drives learning. Children learn more when they cooperate, discuss, and mingle with others than when they fly solo. When families do things together, children thrive.

Actively Engaging: Children must be "minds on" -acting, not passively observing. The activity should spark a learning goal.

Iterative: Children enjoy activities that afford new perspectives rather than repetitious sameness. Activities should be open to change.

What Kids Learn... The 6Cs

Building the skills for future success.

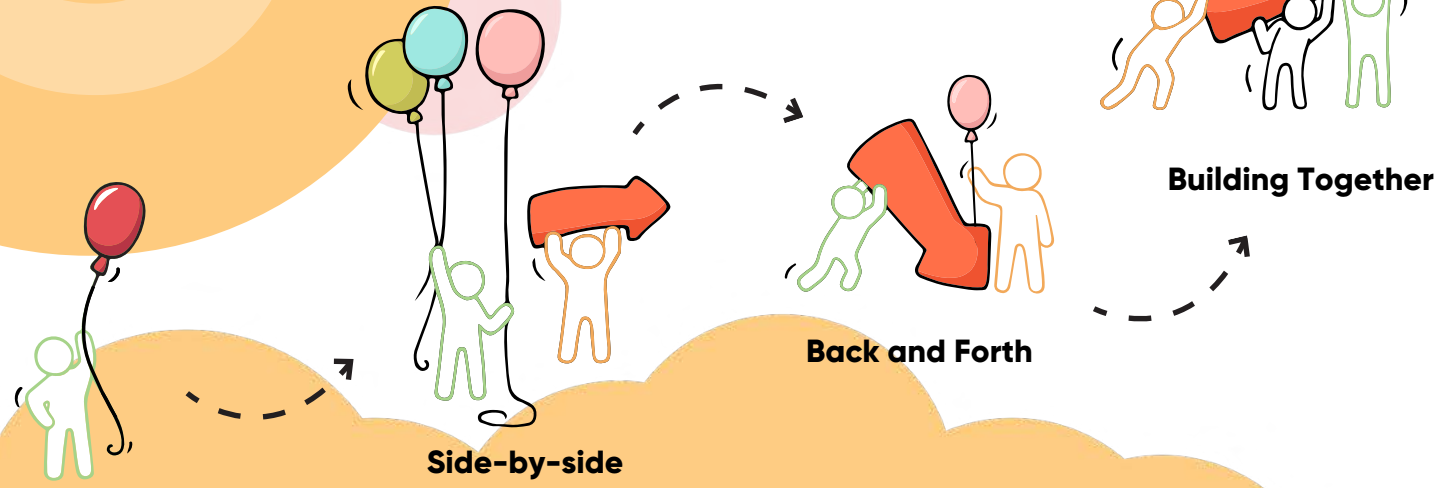
To flourish in this future, kids will need to master a suite of skills that complement and evolve with each other. We call them the 6 C's:

- Creative Innovation
- Critical Thinking
- Communication
- Collaboration
- Confidence
- Content

Let's follow two children, Dante and Maria on the path to develop the 6 Cs. Through Playful Learning, Dante and Maria can "level up" or progress on each C, as they make their journey to develop all 6 Cs.

Collaboration

Their first stop on the 6 Cs pathway is Collaboration. Engaging in playful learning encourages Maria and Dante to build their collaboration skills – from playing alone, to playing side-by-side, to interacting back and forth, to eventually building something together. Because Dante and Maria are developing effective collaboration skills, they can move forward on the pathway to Communication!



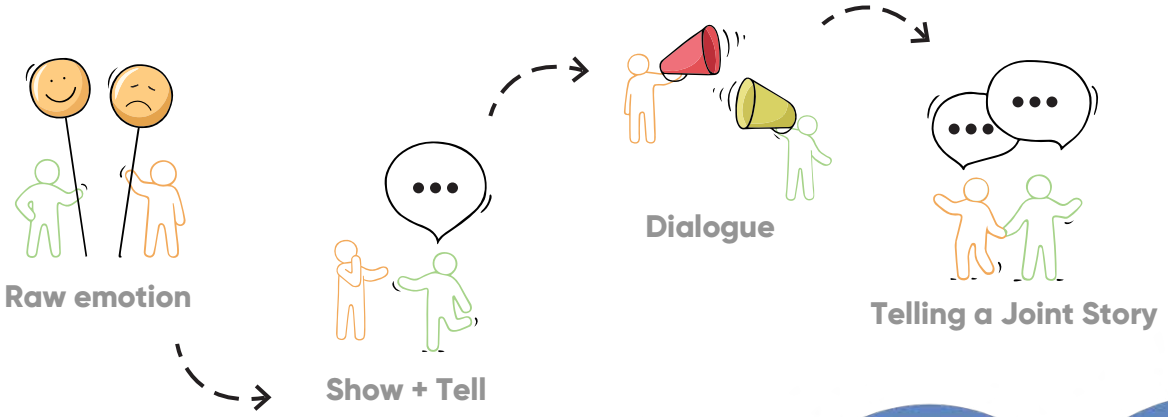
On your own

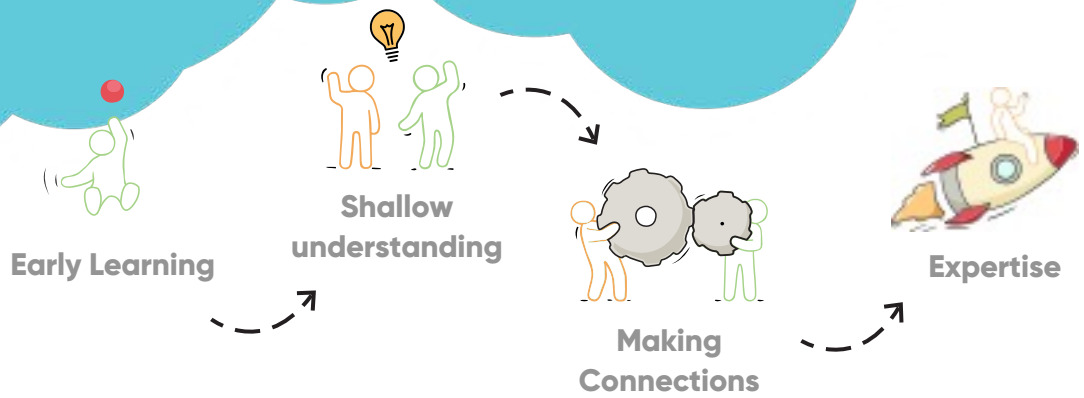
Side-by-side

Back and Forth

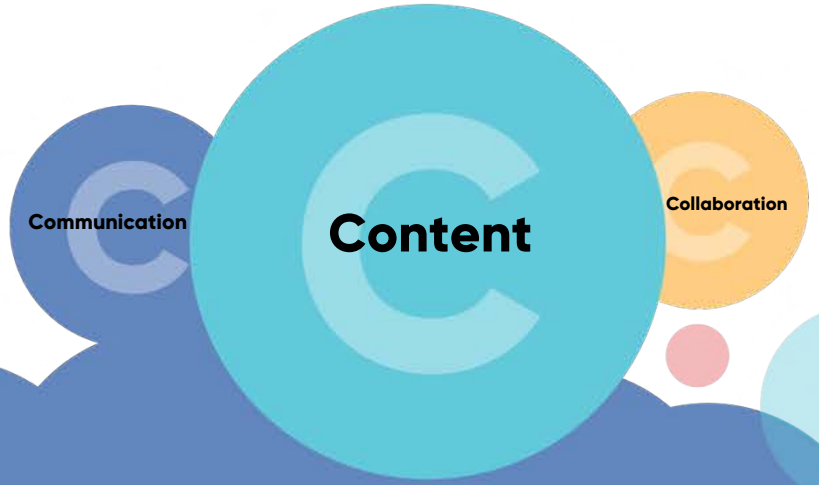
Building Together

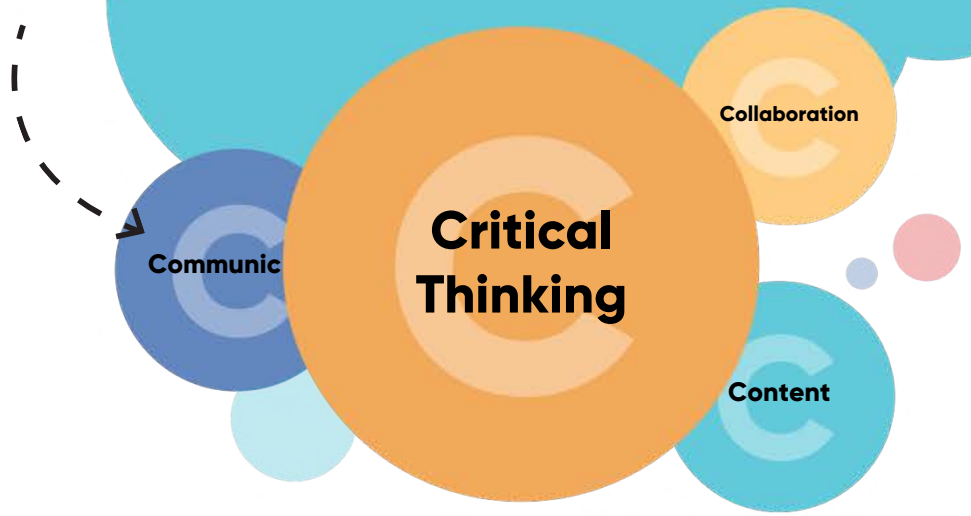
Collaboration promotes Communication skills by prompting Maria and Dante to move past simply communicating through raw emotion to learning how to show and tell, in which children take the stage by turn, to engaging in real back and forth dialogue. Sharing thoughts, ideas, and new vocabulary can further propel Maria and Dante to the top level of communication.

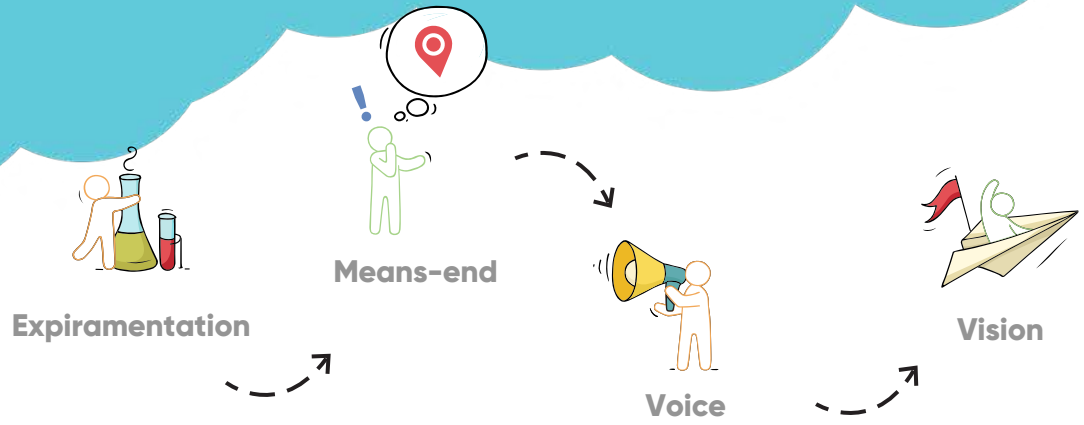




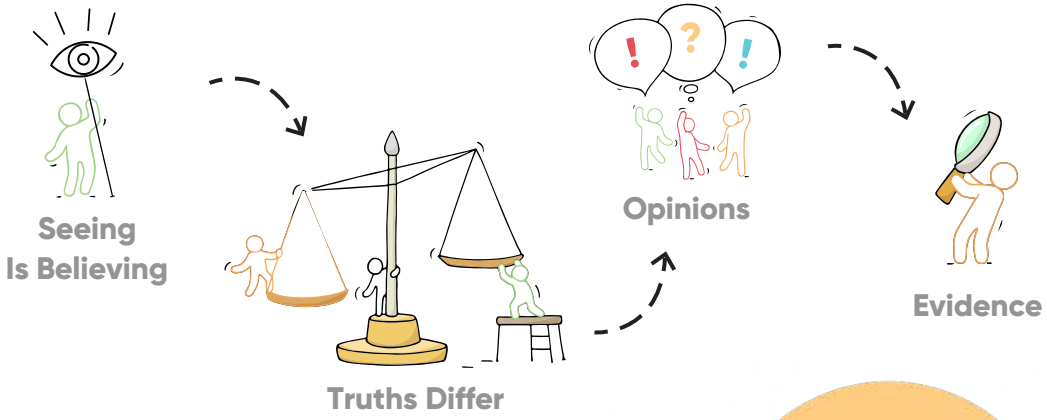
Gaining collaboration and communications skills drives Maria and Dante's Content learning. Playful learning supports children to move beyond early content skills like identifying cats and dogs to recognizing that cats and dogs have lots in common with other animals. Their breadth of knowledge will further increase when they learn about mammals versus amphibians. Making these connections and understanding information in a deeper way, leads to the ability to identify and apply information to new contexts.



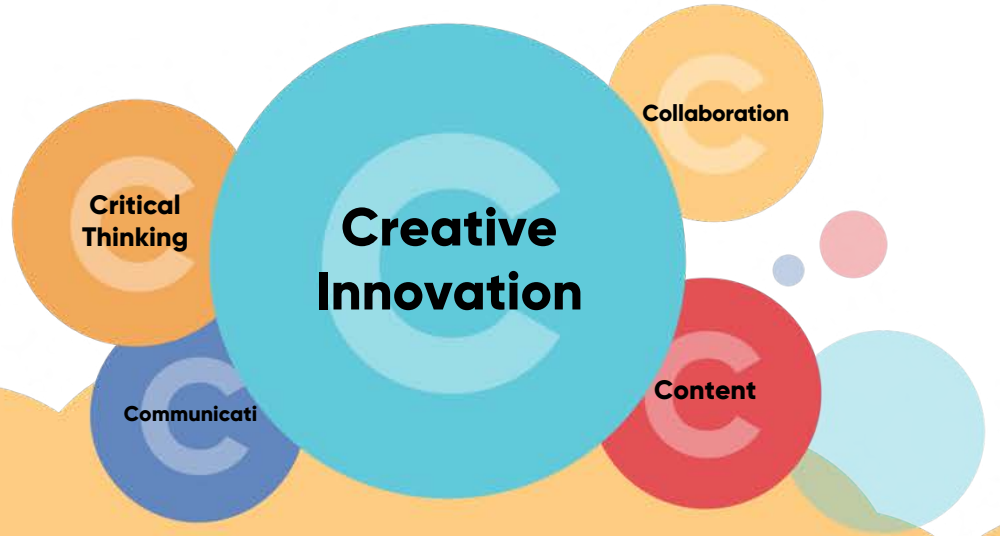


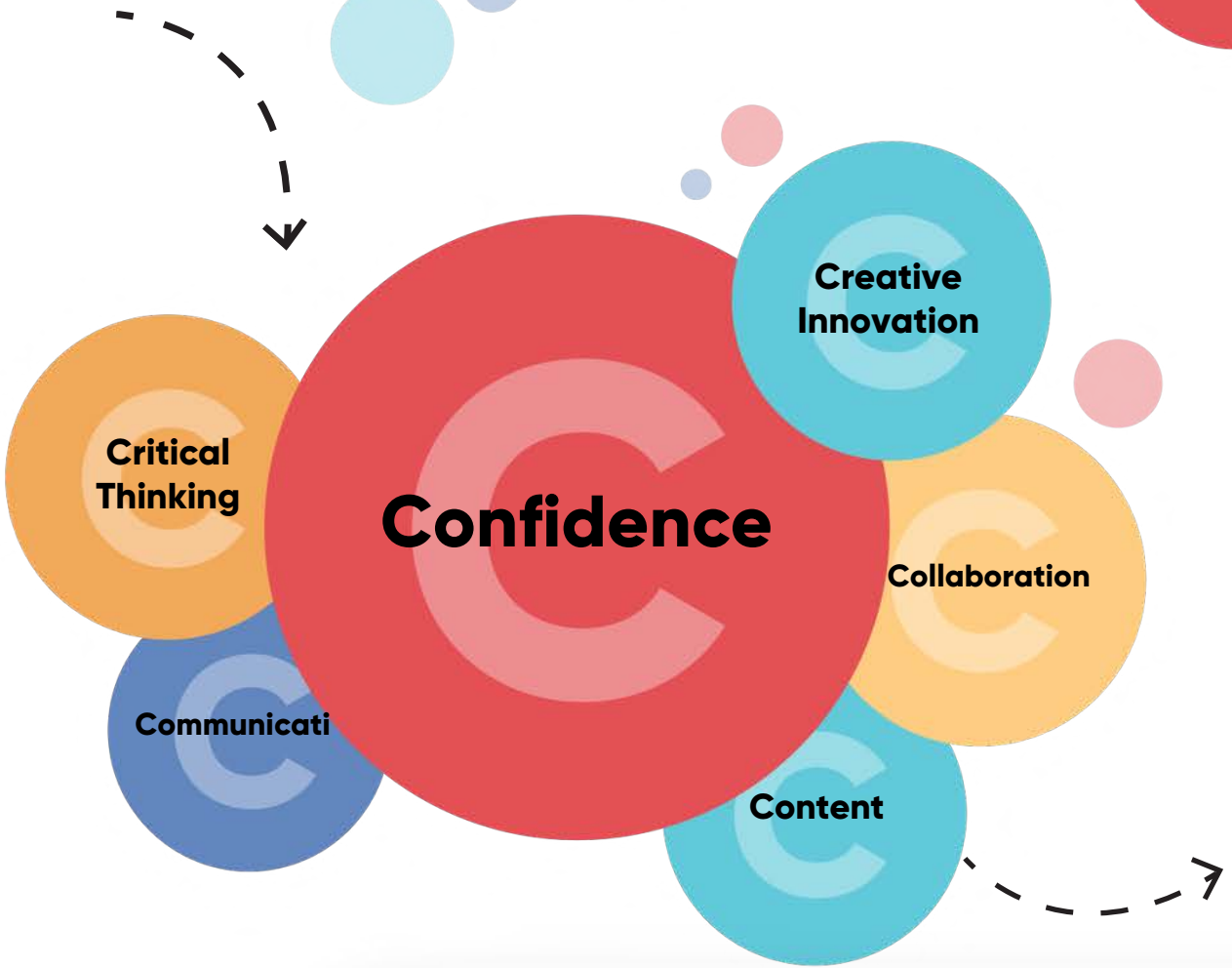


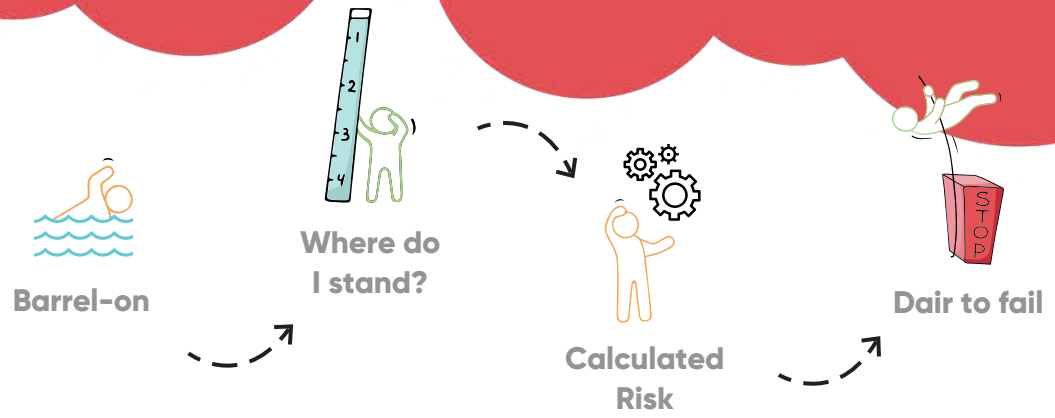
As Maria and Dante amp up their content learning, they begin to engage in Critical Thinking. Playful learning can help them move past simply "seeing is believing" and move up to understanding that people can hold differing ideas, giving rise to their forming their own opinions, based on what they know. The final level of critical thinking includes being able to use knowledge to challenge their own opinions.



Critical thinking skills and learning how to manage knowledge and information can prompt Creative Innovation, which often starts as experimenting and exploring the world around you. They begin to understand that they need to do certain things to achieve a goal. And perhaps they can find new and unique ways to achieve their goal. Maria and Dante are discovering their own voice. By exercising their voices, the children continue to develop their own vision and style toward how to creatively innovate.







Last stop – Confidence! Confidence is developed as Maria and Dante acquire and master the other five skills and speaks to how they approach learning new things. Playful learning encourages children to engage in self-reflection and to evaluate their efforts and how it attributes to their successes and failures, helping them realize that failure is just a part of learning. Understanding that failure is a part of the learning process, helps Maria and Dante have greater confidence in taking risks, "giving it a shot", and daring to fail.

Children may practice each of the 6Cs individually and not sequentially, but it is the totality of the 6Cs working together that children will need to blossom.

photo: Sahar Coston-Hardy

Action Steps

For creating a Playful Learning Environment

Action Steps for Creating a Playful Learning Environment

photo: Sahar Coston-Hardy

1 Build on Community Expertise and Experience

Communities know what they need and want for their children. Playful Learning Landscapes embraces the power of community, culture, and diversity to integrate the learning sciences into the connective tissue of neighborhoods.

Starting each Playful Learning Landscape initiative from the dynamic expertise and diverse experiences of community members ensures that the values, hopes, and goals reflect and respect those of the community itself. The greater the community ownership, the greater the potential for sustainability and relevance.

2 Start with an Idea

Perhaps it is to activate an underutilized space at a bus stop or to create a safe route for children to walk to school or to enhance literacy achievement in a neighborhood.

Creating a playful learning initiative starts with an idea- often from the community but sometimes emerging from other sources. Perhaps you represent an organization that works with communities to realize their goals, or an architect engaged to design a new space in the community, or a funder committed to improving learning outcomes – regardless, spending time to listen to community aspirations and wisdom, while sharing and adapting possibilities is critical to success.

photos: Sahar Coston-Hardy

3 Identify Partners and Build a Team

Successful initiatives require planning, coordination, and resources. Who is the champion for the idea? Who should be sitting at the table with you? How will the team work together and allocate responsibilities?

4 Define the Learning Goal with the Community

The goal may be to foster more collaboration between adults and children at the bus stop, or build more STEM learning into a walk to school, or improve communication and collaboration. Regardless, the learning goal drives the activity.

5 Maximize Playful Learning Principles

Once there are some ideas for activities, test them against the rubric for "how" children learn and "what" they learn to make sure the learning is intentional. **Ask whether the activity(s) qualifies as active or too passive? Will the children have fun with this activity or will they be easily distracted? Can the activity be more meaningful to the community?**

6

Create Easy-To-Follow Prompts

When prompts are featured alongside activities, they can draw attention to intentional learning goals and create exciting opportunities for caregiver-child interaction. For instance, when caregivers and children play on a life-sized ruler the prompt may suggest "Measure how far you can hop with two hops." This simple prompt can inspire the caregiver to engage in math talk regarding how they hopped.

7

Plan for Needs

Is the site appropriate and available for use? What materials will be needed? Are there resources to sustain the work? What permissions are needed to proceed with the work? Or regulations that govern the activities? Who will execute the project design? How will the activity be maintained?

8

Communicate, Communicate, Communicate

Share what is going on with the broader community.
Communicate often and clearly.

9

Test Performance

Is the activity in the space intuitive? Observe how families use and interact with the space. Are the neighbors happy?

10

Refine for Future Iterations

Adjust based on family and community feedback. Share your experiences!

11

Maintain and Rejuvenate

Ensure that there are plans to maintain the site and to rejuvenate the activities as needed.

photos: Sahar Coston-Hardy, Rachael Todaro and Saxum

Examples.

It's time to reimagine how the ordinary can become extraordinary

Imagine a supermarket that doubles as a children's museum; a bus stop outfitted with puzzle walls and cognitive games; or a human-sized board game where children intuitively solve math problems to move around the game board.

Playful Learning Landscapes come in many forms. They range from Do-it-Yourself activities that are simple and inexpensive to implement, to larger, multi-faceted installations. Regardless of your budget, you can create a playful learning landscape. The following are some examples of Playful Learning from across the country beginning with some basic activities...

Do-it-Yourself

These DIY activities are easy to create and cost effective so that you can make them on your own…

photos: Sahar Coston-Hardy, Rachael Todaro

Jumping Feet

Children can control their impulses and get to think flexibly when engaging in this new type of hopscotch that challenges them to use one foot to jump on two feet and two feet to jump on one.

Ask your child:
Can you put two feet where there is one foot and one foot where there are two feet?

Fact:
Jumping Feet can build impulse control!

Learning Goal:
Develop impulse control and flexible thinking while hopping alongside friends and caregivers.

Estimated Cost: **$** $$ $$$
Difficulty to Build: **Low** Medium High
Complexity of Implementation: **Low** Medium High

Does it include the 6 Cs?

- Communication
- Collaboration
- Content
- Critical Thinking
- Creative Innovation
- Confidence

Does it include the principles of play?

- ✓ Fun
- ✓ Actively Engaging
- ○ Meaningful
- ✓ Socially Interactive
- ✓ Iterative

photos: Sahar Coston-Hardy

Life-size Ruler

Kids can have fun seeing how far they can jump on this life-size ruler to develop measuring and number skills.

Ask your child:
Measure how far you can go with 2 jumps!

Fact:
Life-size ruler helps build math skills!

Learning Goal:
Practicing magnitude, number identification, counting, and measuring skills.

Estimated Cost: **$** $$ $$$

Difficulty to Build: **Low** Medium High

Complexity of Implementation: **Low** Medium High

Does it include the 6 Cs?

- **Communication**
- Collaboration
- **Content**
- **Critical Thinking**
- Creative Innovation
- Confidence

Does it include the principles of play?

- ☑ Fun
- ☑ Actively Engaging
- ○ Meaningful
- ☑ Socially Interactive
- ○ Iterative

Musical Pipes

Children follow home-made cards or prompts to play musical patterns.

Ask your child:
Play this pattern on the musical tubes! What comes next?

Fact:
Reorganizing patterns helps children make predictions, an essential skill for math learning!

Learning Goal:
Understanding and continuing patterns through guided music practice.

Estimated Cost: **$** **$$** $$$

Difficulty to Build: **Low** **Medium** High

Complexity of Implementation: **Low** **Medium** High

Does it include the 6 Cs?

- **Communication**
- Collaboration
- Content
- **Critical Thinking**
- **Creative Innovation**
- Confidence

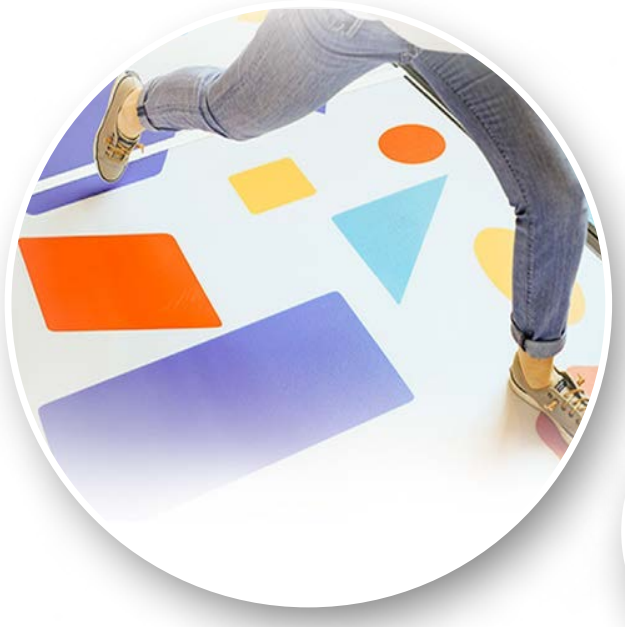
Does it include the principles of play?

- ✓ Fun
- ✓ Actively Engaging
- ○ Meaningful
- ✓ Socially Interactive
- ✓ Iterative

photos: Sahar Coston-Hardy

Shape Games

Children jump from one shape to the next depending on the rules they create with caregivers and other children.



Ask your child:
Jump in all the circles in the shape zone!

Fact:
Shape games support reasoning skills that play an important role in scientific thinking!

Learning Goal:
Identifying different shapes, understanding the relations between different shapes and colors, using shape and color rules to practice impulse control.

Estimated Cost: **$** **$$** $$$

Difficulty to Build: **Low** **Medium** High

Complexity of Implementation: **Low** **Medium** High

Does it include the 6 Cs?

- Communication
- Collaboration
- **Content**
- **Critical Thinking**
- Creative Innovation
- Confidence

Does it include the principles of play?

- ✓ Fun
- ✓ Actively Engaging
- ○ Meaningful
- ✓ Socially Interactive
- ✓ Iterative

photos: Sahar Coston-Hardy

Bean Bag Toss

Kids toss bean bags into a chalkboard grid including with hand-drawn numbers 1-5. First one to 21 wins!

Ask your child:

Toss the bean bags in the slots. Subtract odd numbers and add even numbers from your score. First one to 21 wins!

Fact:

Bean bag toss builds spatial and math skills!

Learning Goal:

Learn to collaborate as a team by practicing number identification, counting, and arithmetic skills.

Estimated Cost: **$** **$$** $$$

Difficulty to Build: **Low** **Medium** High

Complexity of Implementation: **Low** **Medium** High

Does it include the 6 Cs?

- Communication
- Collaboration
- Content
- Critical Thinking
- Creative Innovation
- Confidence

Does it include the principles of play?

- [x] Fun
- [x] Actively Engaging
- [ ] Meaningful
- [x] Socially Interactive
- [x] Iterative

photos: Sahar Coston-Hardy

Puzzle Games

Kids complete puzzles of meaningful images to stimulate spatial skills.

Ask your child:
How do the pieces go together?

Fact:
Puzzle Wall builds spatial skills!

Learning Goal:
Enhance critical thinking and spatial skills known to predict later math ability.

Estimated Cost: $ **$$** **$$$**

Difficulty to Build: Low **Medium** **High**

Complexity of Implementation: Low **Medium** **High**

Does it include the 6 Cs?

- Communication
- Collaboration
- Content
- Critical Thinking
- Creative Innovation
- Confidence

Does it include the principles of play?

- Fun
- Actively Engaging
- Meaningful
- Socially Interactive
- Iterative

photos: Sahar Coston-Hardy

Fraction Dice

Kids roll the whole number and fraction dice to move forward on a life-size ruler. Encourages measurement, magnitude, and spatial skills.

Ask your child:
Roll the dice! Move forward on the ruler when you roll fractions and backward with whole numbers!

Fact:
Playing with rulers and board games helps build math skills!

Learning Goal:
Understanding whole numbers and fractions by rolling fraction dice and moving forward or backward on a life-size game board/ruler.

Estimated Cost: **$** **$$** $$$

Difficulty to Build: **Low** **Medium** **High**

Complexity of Implementation: **Low** **Medium** High

Does it include the 6 Cs?

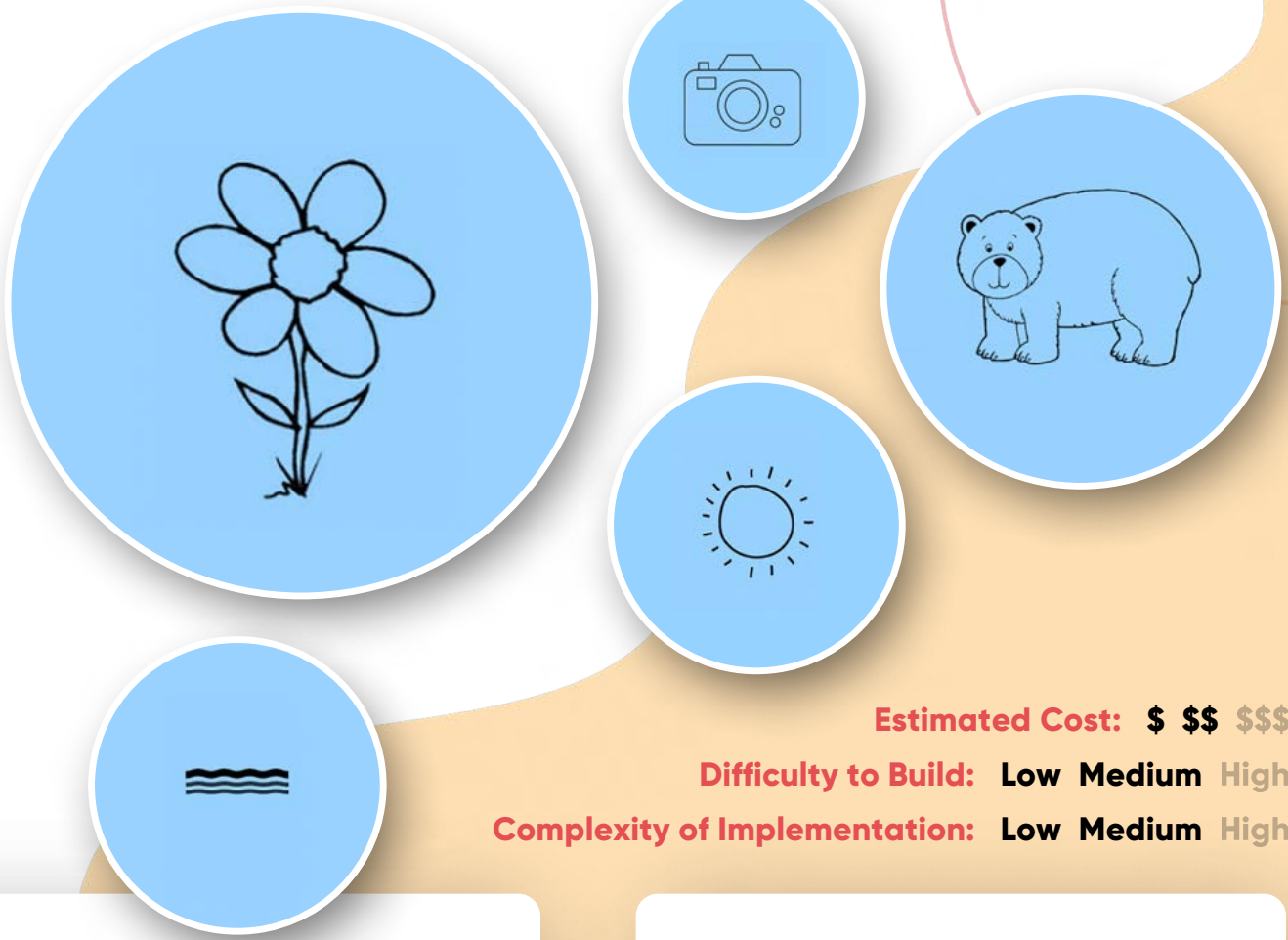
Communication | Collaboration | **Content** | **Critical Thinking** | Creative Innovation | Confidence

Does it include the principles of play?

- ✓ Fun
- ✓ Actively Engaging
- ○ Meaningful
- ✓ Socially Interactive
- ✓ Iterative

Stories

Kids jump from one narrative picture cue to another to create their own story.



Ask your child:

Can you connect the pictures together to tell your own story?

Fact:

Telling stories builds strong language skills!

Learning Goal:

Develop narrative skills and practice pretend play to increase language use known to enhance literacy skills.

Estimated Cost: **$** $$ $$$

Difficulty to Build: **Low** **Medium** High

Complexity of Implementation: **Low** **Medium** High

Does it include the 6 Cs?

- Communication
- Collaboration
- Content
- Critical Thinking
- Creative Innovation
- Confidence

Does it include the principles of play?

- Fun
- Actively Engaging
- Meaningful
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photo: Sahar Coston-Hardy

Build Them Anywhere activities

A bit more complex, but still easy to build, install, and move

photos: Molly Schlesinger

Playwall

The Learning Goal: Modeled after Candy Chang's Before I Die exhibit, Playwall is designed to enhance intergenerational Communication amongst community members, Critical Thinking about meaningful types of play, and the Confidence that grows from community engagement.

Any ordinary wall can be fitted with a Playwall that invites parents and kids to share "When I was little, I loved to play..." The wall will soon be filled with exciting games that community elders can teach the younger generation, deepening community connections, and allowing adults and children to learn as they play together.

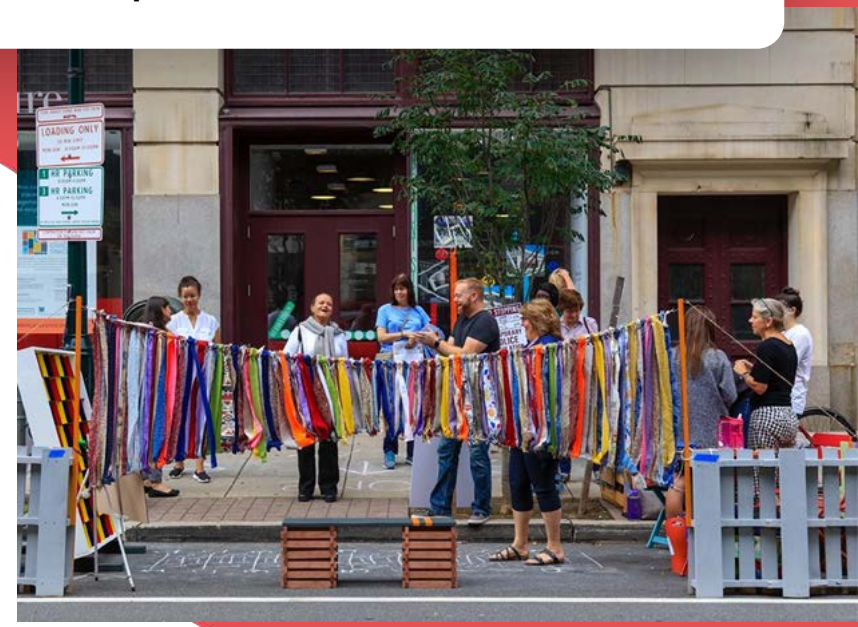
Does it include the 6 Cs?

- **Communication**
- Collaboration
- Content
- Critical Thinking
- Creative Innovation
- Confidence

photos: Sahar Coston-Hardy

Park(ing) Day

Since 2008, "the number of parks throughout Philadelphia increases dramatically each year on the third Friday in September, when activists, artists, architects, and other citizens transform metered parking spaces into temporary public parks. Known as PARK(ing) Day, this annual event re-imagines the possibilities of 160 square feet of public space. The event celebrates parks and other public spaces in cities across the country, and raises awareness of the need for more pedestrian-friendly spaces in our urban areas." (from the Parking Day Philadelphia website)



Does it include the 6 Cs?

- Communication
- Collaboration
- Content
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- Creative Innovation
- Confidence

photos: Rachael Todaro

PopUpPlay

In 2019, PopUpPlay and Playful Learning Landscapes partnered to bring playful learning to the Belmont Alliance Civic Association's Annual Movies on the Block event and PopUpPlay's 2nd Annual Play Fest on Philadelphia's Cherry Street Pier where our low-cost activities organically prompted the kinds of interactions that help build strong relationships between caregivers and children, while addressing children's skill development.

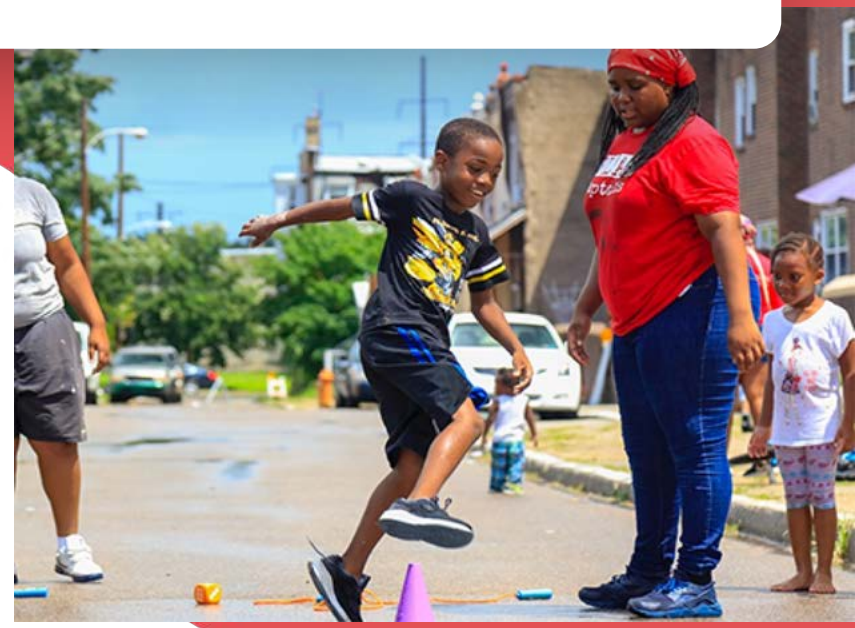
Does it include the 6 Cs?

- Communication
- Collaboration
- Content
- Critical Thinking
- Creative Innovation
- Confidence

photos: Sahar Coston-Hardy

Fab Youth Philly

The Philadelphia Play Streets program, overseen by Philadelphia Parks & Recreation, shuts down hundreds of city streets during the summer to provide free meals and opportunities for children to play with community-based organizations. One such community-based organization, Fab Youth Philly, created the Play Captains Initiative, which focuses on teens' workforce development and civic engagement with the mission to empower and train them in leadership, playful learning, and facilitation to make the Play Streets and neighborhoods of Philadelphia more playful for neighborhood children.



Does it include the 6 Cs?

- Communication
- Collaboration
- Content
- Critical Thinking
- Creative Innovation
- Confidence

photos: Saxum

Supermarket Speak

The supermarket can be so much more than a place to buy food. There's learning in those aisles. Filled with labels and signs, numbers on aisles and cash registers, this project was designed as a low-cost intervention to spark adult-child conversations. Since conversations are the golden foundation for learning, Supermarket Speak becomes a vehicle for enriching language in our everyday spaces. The Too Small To Fail initiative even tried this technique in laundromats and in playgrounds.

Does it include the 6 Cs?

- **Communication**
- Collaboration
- Content
- **Critical Thinking**
- Creative Innovation
- Confidence

photos: Andres Bustamante

Fraction Ball

Can we redesign a basketball court to emphasize fraction and decimal number learning? Researchers at UC Irvine and El Sol Sciences & Arts Academy partnered in the creation of Fraction Ball in Santa Ana, CA. For Fraction Ball, the lines on a basketball court are painted to emphasize fraction and decimal learning by allowing children to take shots that are worth a fraction of a point with the goal of earning an exact number of points on a number line next to the court.

Does it include the 6 Cs?

- Communication
- Collaboration
- Content
- Critical Thinking
- Creative Innovation
- Confidence

Large scale activities and installations

Clustered activities offer more opportunities for learning. This larger scale approach requires dedicated funding and professional design and construction.

photo: Sahar Coston-Hardy

photos: The Ultimate Block Party

The Ultimate Block Party

Can we bring the science of how kids learn through play to the park for all to see?

Does it include the 6 Cs?

- Communication
- Collaboration
- Content
- Critical Thinking
- Creative Innovation
- Confidence

The Learning Goal:

The Ultimate Block Party targeted all of the 6Cs through a series of playful outdoor installations that focused on activities that sparked fun, active, engaged, meaningful, and socially interactive playful learning.

The Design:

The original 2010 Ultimate Block Party invited scientists from across the country to transform NYC's Central Park into a festival of learning.

The Team:

The Ultimate Block Party was an idea conceived by Kathy Hirsh-Pasek, from Temple University; Roberta Michnick Golinkoff, from the University of Delaware; Dorothy Singer, from Yale University; Susan Magsamen, from Johns Hopkins University; the Goddard Schools; LEGO Foundation; and KABOOM!

The Science:

Over 50,000 people participated, and 291 people were studied to ask whether they began to see the learning value in the playful exhibits. Those who visited 3 or more of the 28 exhibits began to link play and learning.

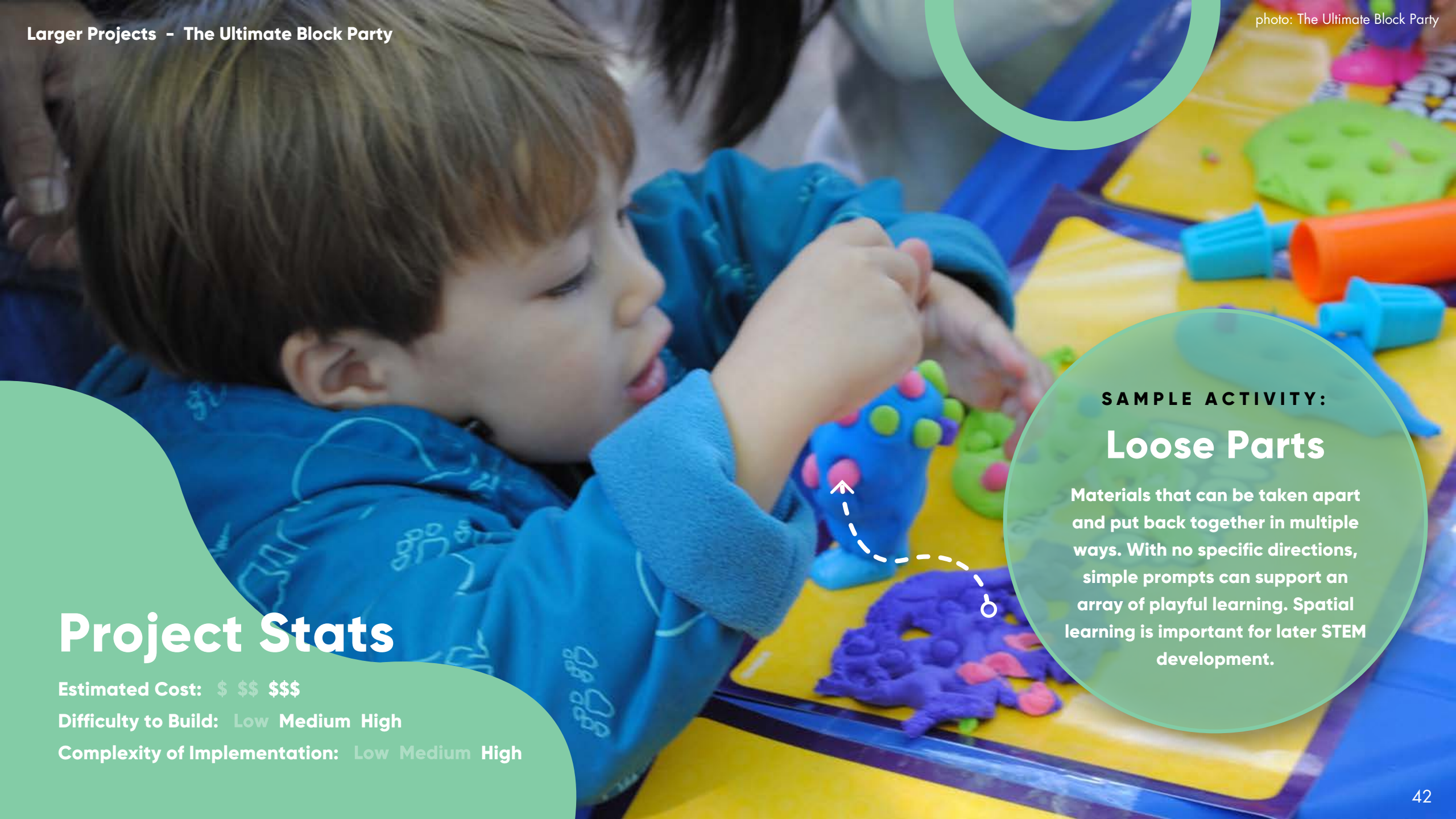


photo: The Ultimate Block Party

SAMPLE ACTIVITY:

Loose Parts

Materials that can be taken apart and put back together in multiple ways. With no specific directions, simple prompts can support an array of playful learning. Spatial learning is important for later STEM development.

Project Stats

Estimated Cost: $ $$ **$$$**

Difficulty to Build: Low **Medium** **High**

Complexity of Implementation: Low Medium **High**

photos: Sahar Coston-Hardy

Parkopolis

Can we stimulate math learning through number and measurement as part of a life-sized board game with fraction dice?

Does it include the 6 Cs?

- Communication
- Collaboration
- Content
- Critical Thinking
- Creative Innovation
- Confidence

The Learning Goal: Parkopolis supports children's playful Communication with adults and fellow peers around Content in science and math. It encourages Collaboration and cooperative game play, Creative Innovation in creating new rules, and the Confidence to persist on challenging activities.

The Design: Parkopolis builds ideas about numbers, measuring, and fractions – a stumbling block for many children – into a life-size board game. Children roll "fraction dice" to skip around the board in 1/2 and 3/4 leaps, and draw giant cards that engage them in play that is hands-on and "minds-on".

The Team: An initial pilot was developed in Switzerland through a partnership between Kathy Hirsh-Pasek, Andres Bustamante, the Playful Learning Landscapes Initiative, Christine Riesen and We Are Play Lab, and Nabil Shahidi. A full-scale version of Parkopolis was presented as an exhibit in Philadelphia's Please Touch Museum in summer 2018.

The Science: Early findings suggest that children start talking about fractions, use measurement and number language, and engage in scientific reasoning – just by playing our game! Parkopolis targets STEM learning through pattern recognition and memory. It calls on children to be mentally and physically flexible, moving their bodies in new ways, or measuring their jumps with a giant ruler.

photo: Sahar Coston-Hardy

SAMPLE ACTIVITY:

Choice Cards

Oversized playing cards present challenging activities, while allowing kids the flexibility to create their own rules.

Project Stats

Estimated Cost: $ **$$** **$$$**

Difficulty to Build: Low **Medium** **High**

Complexity of Implementation: Low **Medium** **High**

photos: Sahar Coston-Hardy

Urban Thinkscape

Can we turn bus stops into hubs for learning, so families can play math, literacy, and even impulse control games while they wait?

Does it include the 6 Cs?

- Communication
- Collaboration
- Content
- Critical Thinking
- Creative Innovation
- Confidence

The Learning Goal: Urban Thinkscape encourages playful interactions between children and caregivers that feature Content in math, science, and literacy, as well as Collaboration and Communication with peers, adults, and family members.

The Design: Urban Thinkscape began with a community's dream to energize Philadelphia's Belmont neighborhood with playful learning. They chose a bus stop next to a grassy lot where Martin Luther King, Jr. gave a historic speech in 1965 as part of his "Freedom Now" tour. Now, puzzles activate the space behind benches, children scramble and climb across story art, and a canopy projects shadows of fruits and vegetables onto the ground while children play on a puzzle wall depicting Martin Luther King, Jr. in a site brought to life by over 100 local youth and community members!

The Team: Urban Thinkscape is a partnership between the Belmont Alliance Civic Association, Temple Infant and Child Lab, Drs. Roberta Golinkoff and Brenna Hassinger-Das, and architect Itai Palti of the Conscious Cities movement. Public Workshop was also a vital collaborator.

The Science: Preliminary results suggest that families at the bus stop are now interacting around the games while talking about numbers and shapes. They are moving, thinking, and talking about language, literacy, and STEM.

photo: Sahar Coston-Hardy

SAMPLE ACTIVITY:

Jumping Feet

Shoe prints encourage jumping, and the pattern helps kids control impulses and think about their next step! Research suggests that controlling impulses is part of developing executive function skills, important for learning how to learn and for brain development.

SAMPLE ACTIVITY:

Stories

Kids move from one image to another, making up a story as they go. A large body of research establishes the link between the ability to tell a story and later reading comprehension.

Project Stats

Estimated Cost: $ $$ **$$$**

Difficulty to Build: Low Medium **High**

Complexity of Implementation: Low Medium **High**

photos: Halkin Mason

Play & Learn Library

The Free Library wondered if families could be encouraged to "stay and play" while also fostering learning goals in language and STEM.

Does it include the 6 Cs?

- **Communication**
- **Collaboration**
- Content
- Critical Thinking
- Creative Innovation
- **Confidence**

The Learning Goal: The Play-And-Learn Spaces will foster Collaboration through building activities with peers, Communication and language skills, and Confidence through physical achievements.

The Design: Each branch has a set of large multi-colored tangram blocks that allow children to build seating and forts, learning pattern recognition, shapes, and geometric construction. The Cecil B. Moore branch features a spelling/climbing wall, a stage box for fort building, and bookshelf puzzle nooks for reading. The Whitman branch sports a lookout tower with letters cut out of its sides. The Wyoming branch offers a stage with magnetic word panels and tiered amphitheater seating leading to a homework station.

The Team: The project is a partnership with the Free Library of Philadelphia, architecture firm DIGSAU, play consultants Studio Ludo and Smith Memorial Playground and Playhouse, fabricator Erector Sets. Playful Learning support from Kathy Hirsh-Pasek (Temple University), Brenna Hassinger-Das (Pace University), and Jennifer Zosh (Penn State University).

The Science: The play spaces are such a hit, attendance has doubled! There have been significant increases in physical activity and laughter, as well as more adult-child interactions.

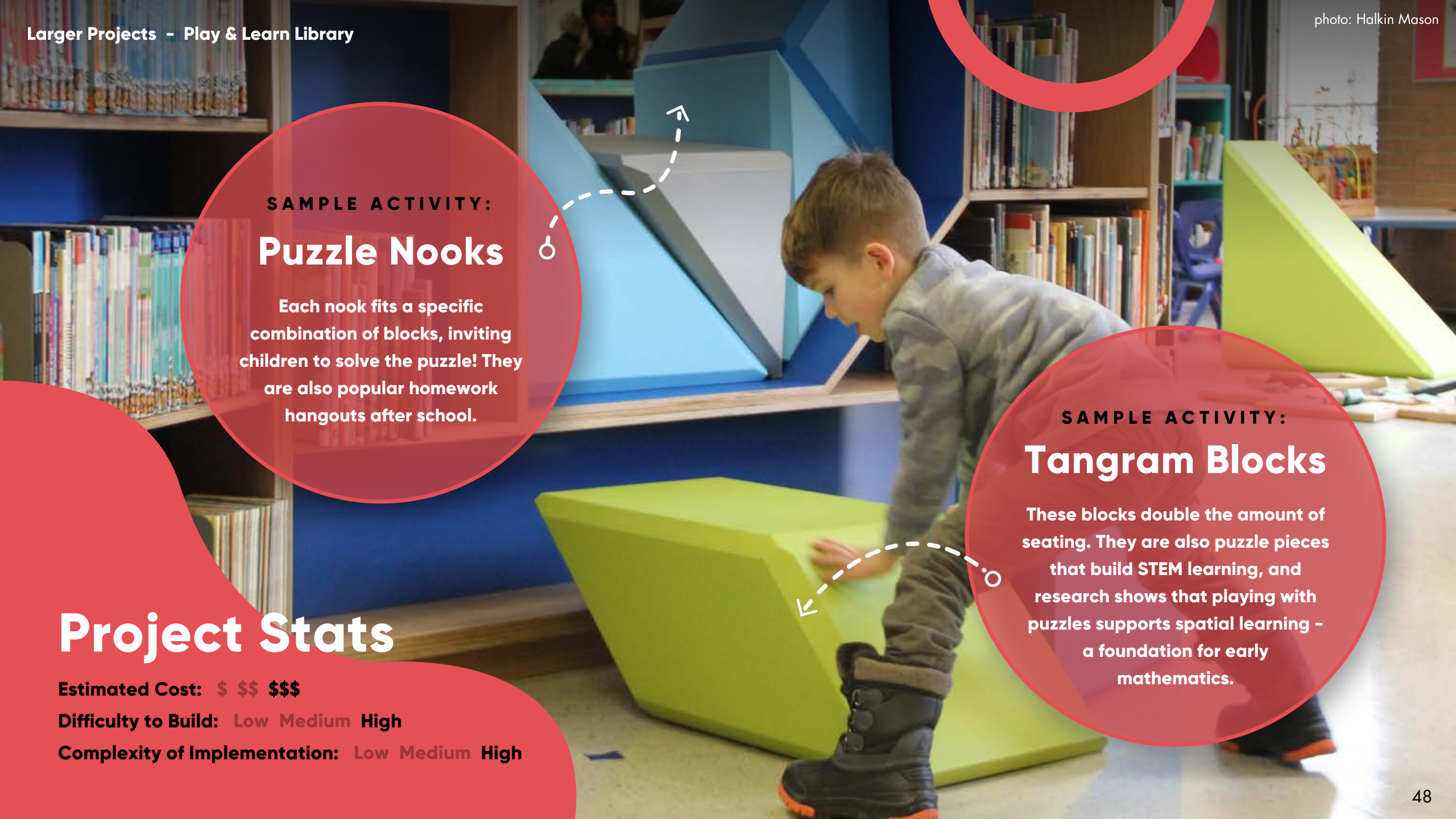


photo: Halkin Mason

SAMPLE ACTIVITY:

Puzzle Nooks

Each nook fits a specific combination of blocks, inviting children to solve the puzzle! They are also popular homework hangouts after school.

SAMPLE ACTIVITY:

Tangram Blocks

These blocks double the amount of seating. They are also puzzle pieces that build STEM learning, and research shows that playing with puzzles supports spatial learning - a foundation for early mathematics.

Project Stats

Estimated Cost: $ $$ **$$$**

Difficulty to Build: Low Medium **High**

Complexity of Implementation: Low Medium **High**

A Deeper Dive into the Science behind Playful Learning

A Deeper Dive into the Science...

How Playful Learning Helps Build Early Competencies

Playful Learning, also known as guided play, refers to a type of play in which children are actively exploring during an engaging activity embedded in a relevant, meaningful context that is structured by caregivers or the environment to guide children toward focusing on the elements that promote learning.[1, 2] By prompting caregiver-child interactions, Playful Learning Landscapes has increased frequency in children's and caregiver's math, spatial, literacy, and science language use and exchange across several empirical studies.

Principles of "How" Children Learn

Children can learn through all kinds of play, but learning is most likely to happen when play is infused with learning goals and when the child is the explorer and discoverer working towards those learning goals. Similarly, children can learn from all types of educational practices, but they learn best when experiencing a core set of principles; learning should be **joyful, meaningful, actively engaging, socially interactive**, and **iterative**.[3]

Specifically, regardless of how one labels a particular educational activity, children learn best under these conditions: a) when they are having fun and enjoying the activity, b) when the activity is meaningful or has significance in their lives, c) when they are actively engaged and involved in the material to be learned, d) when they are social or working with someone else or on a team, and e) when the activity changes with the child's abilities. Play includes all the principles of learning that fuel children's learning.

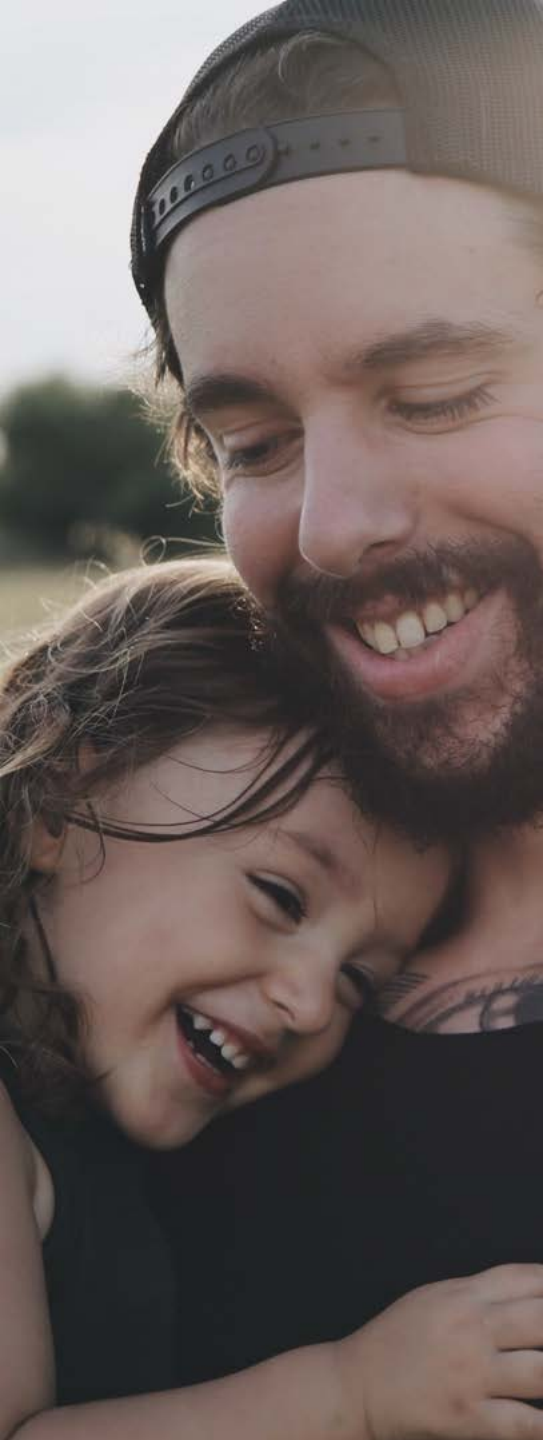
When play is infused with intentional learning goals and when the children are "in charge" and the adult is the "guide on the side", it becomes playful learning.

The Spectrum of Play

Play is difficult to define, but most scholars and play experts have settled on a general definition that play includes joy, agency, flexibility, imagination, and structure of some sort.[4, 5, 6, 7] The most recent and comprehensive way to define play, however, is on a spectrum,[8, 9] with free play anchoring one end (adults neither initiate the play nor direct it) and direct instruction on the other (adult initiated and adult directed instruction). Note that even if an activity is playful, if it is initiated by and directed by an adult, it is direct instruction. Guided play and games lie in the middle (adult initiated but child directed).

Figure 1: Spectrum of Play, adapted from and originally published in Zosh et al., 2018 [10]

	Free Play	Guided Play	Games	Co-opted Play	Playful Instruction	Direct Instruction
Initiated by:	Child	Adult	Adult	Child	Adult	Adult
Directed by:	Child	Child	Child	Adult	Adult	Adult
Explicit learning goal:	No	Yes	Yes	Yes	Yes	Yes



Conceptualizing play as a spectrum, an idea that was first floated by Doris Bergen in 1987,[11] allows one to categorize play on several dimensions based on who sets up or starts the play event and who directs the action within the play event. When a child defends the fort that s/he imagined and built from the couch cushions, s/he is engaged in free play and becomes that knight in shining armor. Play in a children's museum or on a playstreet occurs within a well-curated play activity, but children direct their engagement within the setting. Games with rules (or a loose set of rules) form a subset of guided play, in which the adult may not be guiding players directly but keeps them on task and reminds them of the rules. In games with rules, the adult is like a coach in a play environment. In direct instruction, the adult morphs into the director role. Traditional school can be fun, but you need to wait for recess to find real play. Thinking of play as a spectrum holds different value and promotes unique outcomes.[12,13]

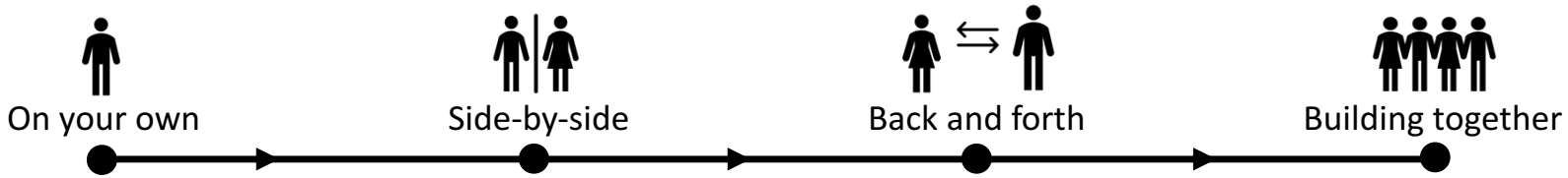
Free play is a wonderful way for children to explore the world around them, interact with others, and creatively imagine new realms. Research suggests that pure exploration might not be the best way to ensure desired educational outcomes.[14] While children benefit from the unconstrained social interaction and joy of free play, evidence suggests that more guided forms of play can help children to develop their abilities in math, language, spatial skills, literacy, and other areas. In guided play, adults or the play environment gently guide children's activity, consciously enhancing its learning elements.

The 6Cs: Twenty-First Century Skills for "What" Children Learn

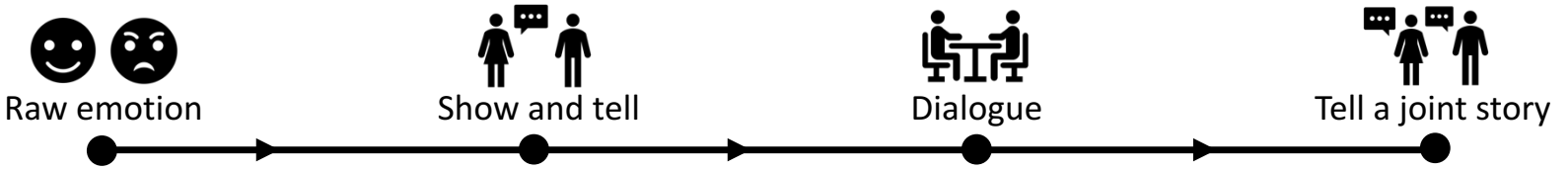
Golinkoff and Hirsh-Pasek's book, *Becoming Brilliant,*[15] reviews a suite of skills consistent with those of the Partnership for 21st Century Learning, noted in Trilling & Fadel's book, *21st Century Skills: Learning for Life in Our Times.*[16] Golinkoff and Hirsh- Pasek argue that playful learning embraces and enhances each of these competencies that build on one another.

The types of learning goals that are embraced by science and in the business community can be termed "the 6Cs," or the suite of skills children need for success in and out of school to move from crib to career. The 6Cs represent a systematic model of content that serves as the intentional learning goals promoted by playful learning: **communication, collaboration, content, critical thinking, creative innovation**, and **confidence**. Each competency builds within itself and in tandem with one another.

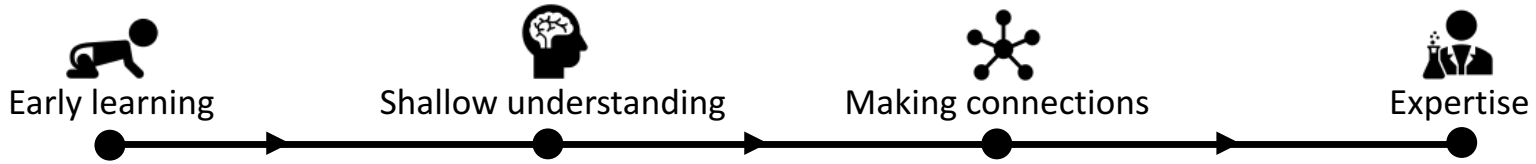
Collaboration includes working in teams or one-on-one with others, as well as demonstrating socially appropriate behaviors, building off others' ideas, recognizing people's unique set of experiences and knowledge, and building community.



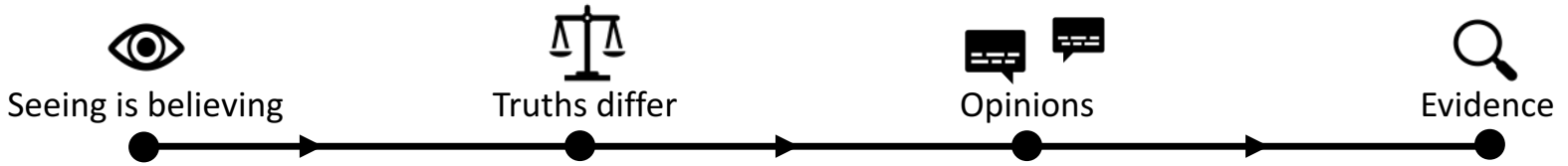
Communication skills like speaking and writing, as well as listening and understanding others' perspectives are born from collaboration.



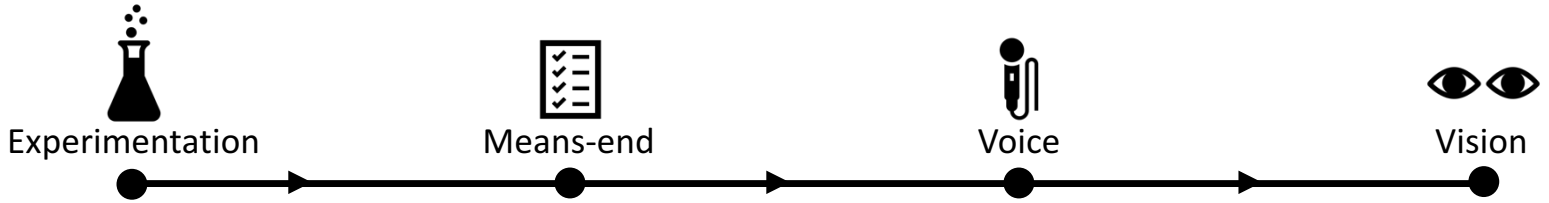
Content embeds learning traditional content like math, vocabulary, science, and history, but adds the cognitive-behavior skills humans need to learn that content. The "executive function" skills that help us learn include problem solving, memory, attention, impulse control (thinking before just doing), and flexible thinking. These competencies tend to use communication as a base.



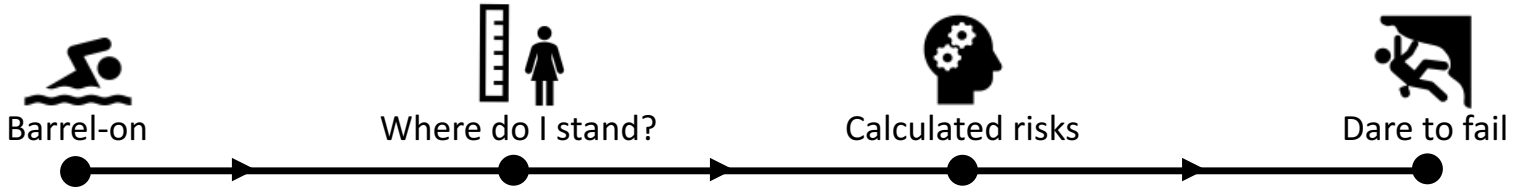
Critical thinking includes strategies for problem solving, building evidence to derive a position, and making connections between different areas of knowledge. It is based on content.



Creative innovation refers to finding new solutions, changing traditional patterns or rules, and discovering novel paths through a problem space.



Confidence refers to learning from failure and adopting a stance that with effort you can do better. The result, having confidence allows you to push limits and take reasonable risk.



Playful learning not only embraces the "how" of learning, but also the "what" of the 6Cs.

Scientific Evidence of Playful Learning

The scientific literature is steeped with the evidence supporting playful learning. Playful learning has been linked to particular socio-emotional, cognitive, and health outcomes within the context of cognitive behavioral science. Just like a dynamic classroom or out-of-school environment, these activities connect to outcomes that do not exist in isolation, but rather contribute to incremental development of multiple interrelated skills. For example, cognitive and socio-emotional development are actually mutually dependent: social collaboration is a prerequisite for academic success in reading and writing, and the building blocks of cognition are necessary for social competence.[17, 18, 19, 20, 21, 22] From the whole child perspective, playful learning is a developmentally appropriate way to simultaneously foster multiple twenty-first century skills.[23]

Cognitive Benefits

Research has noted a variety of cognitive, academic, and cognitive-behavioral benefits from a playful curriculum, playing educational games, and having access to recess and free play during the school day. Engaging in playful learning can support children's development of social behaviors, language, and vocabulary essential to success in school and beyond. Playful learning can also play a role in building executive functions or *learning to learn* skills.

Executive Functions

Executive functions are the foundation of how humans learn and include a rapidly developing set of higher order cognitive processes, such as working memory, cognitive flexibility, and inhibitory control.[24, 25] These comprise a suite of skills that prepare children for learning and are predictive of developmental trajectories and overall school success. When children have the opportunity to play games that include opportunities for children to work on their behavioral regulation, cognitive flexibility, working memory, and inhibitory control – their executive functions generally improve.[26, 27, 28, 29, 30] Games like Simon Says can support aspects of executive functioning. In the game Simon Says, participants are practicing executive skills such as controlling the impulse to do something when the caller doesn't say "Simon says" and thinking flexibly by responding appropriately when hearing "Simon says" and when not hearing "Simon says".[31]

Multiple studies with US and European children have reported similar positive results.[32, 33, 34, 35] Games like "freeze dance", "duck, duck, goose", and "red light, green light" service executive function because these games require children to wait, switch rules, attend closely, and sustain their attention, which are the behaviors that prepare children to learn.[36, 37, 38]

Even games that include elements of make believe, imagination, fantasy, pretend, and symbols have been shown to support children's executive functions, especially when guided by adults with specific learning goals. Consider when children have just read a storybook and retell the story while pretending to be the characters in the story. In this scenario, children initially activate their memory and communication skills by simply retelling the story. However, taking on the role of the character layers on an extra cognitive layer: children have to remember to stay in character with their friends and behave flexibly and respond to one another from their characters' perspectives, not their own. This type of play has been linked to improved executive functions.[39 , 40 , 41 , 42 , 43 , 44]

Even child-directed play has positive impacts for 6- and 7-year-olds' self-directed executive function. Children with more experience self-directing their unstructured play time had more highly developed executive functions.[45]

Academic Content

Increasingly, studies have demonstrated the power in teaching children academic content and concepts via guided play. Specifically, when an adult guides the learning activity towards an intentional learning goal he or she has in mind, but the child has the agency to make decisions and lead the activity, children tend to learn content better than when children play alone (in free play) or when they are taught outside a playful context (direct instruction).

Research revealed that 4- and 5-year-olds engaging in guided play were more likely to grasp the geometric properties of shapes and retain them a week later when compared to free play and direct instruction.[46] When children and caregivers played a shape and color matching game at home, lower income pre-kindergarten children showed significant improvement in shape knowledge.[47] Guided play in the context of a storybook intervention can even improve

mathematics vocabulary in kindergarteners with math difficulties.[48] Research has also indicated that 4- and 5-year-olds exposed to hybrid book-reading and playful learning literacy interventions, in which children's vocabulary lessons are introduced through storybooks and supported through free play, guided play, and directed play opportunities, learn more vocabulary through adult-supported play than free play.[49]

One of the driving processes connecting playful learning outside of school to in-school success is the amount of content-driven language children hear outside of school - the more math-talk children hear outside of school is related to their in-school math success.[50, 51] Research demonstrates how playful contexts lead to greater child-caregiver talk about content language that is critical to children's in-school learning. For example, board games spur more math talk than puzzles or math-based reading activities for low-income preschoolers.[52] In research comparing math talk elicited by direct instruction, guided play, and free play between parents and 4- and 5-year-old children, the guided play condition elicited more math talk than the free play condition,[53] and parents considered the guided play condition more fun than the direct instruction condition.[54]

Social-Emotional Benefits

Play is important for social-emotional development. The most prominent benefits stem from social play, as simply providing children opportunities to play facilitates meeting new friends and enhancing friendships by creating a shared play culture.[55] Play can maintain friendships by creating identities and cohesive structures in peer groups or allowing peer groups to mix and rotate to engage in different forms of play.[56] Because play often has overarching goals, children are both collaborating to achieve those goals and learning how to work towards a goal with peers.[57, 58] Recent work has noted how play-based kindergarten curricula, such as Tools of the Mind, can support children's socio-emotional

competence, with fewer behavioral problems, and greater self-regulation and positive social relationships.[59] Children's socio-emotional competence occurred from improvements in executive functions, supporting how play can simultaneously support socio-emotional and cognitive development.

Similarly, during child-directed play, peers collaborate in creating rules, or altering rules to games with strictly set rules, developing children's self-regulation.[60] Play that requires or encourages negotiating rules and limitations, taking the perspective of other players, and collaboratively creating play worlds or frameworks with peers has been linked to greater recognition that other people have their own unique perspectives and mindsets.[61, 62]

Physical Benefits

Physical activity during play is important for gross motor development, and additionally has links to cognitive development. Research has indicated that gains in academic achievement are greater for children involved in physical activity interventions.[63, 64] Similar research has revealed children's level of aerobic fitness was related to executive functions.[65] Review work has argued that cognitively enhanced physical activity, such as physical activity that has rules, is social, and requires attention to detail, has greater benefits for academic success than physical activity or exercise without rules or social interaction.[66] Even providing equipment and suggestions can enhance children's physical activity.[67]

Long-term Benefits of Early Competencies

Children spend more of their time outside of school, and much of their learning occurs within a family context.

Parent-child interaction early on has been found to support vocabulary growth because it provides an opportunity for children to engage in activities with the guidance of a more experienced partner.[68, 69, 70] When a parent and child jointly attend to an object, increases in both the number of utterances and turn taking occur[71] which, in turn, supports vocabulary.[72] Vocabulary develops at an exponential rate such that rich vocabulary early on leads to richer vocabulary later.[73] In turn, the breadth of vocabulary supports a cascade of outcomes over the life span including reading skills,[74] math skills,[75] social/emotional development,[76] high-school performance,[77] and employment.[78]

Children's learning and development of critical skills start well before children begin school. Evidence suggests that early literacy skills are predictive of later literacy skills and can be enhanced with guidance from parents or caregivers.[79] Being able to identify letters and use vocabulary early on also predicts higher reading performance and other language skills.[80] Additionally, children's ability to demonstrate oral language competency (e.g., communicative behaviors and the understanding of narrated events) at age 5 predicted reading comprehension skills at age 8.[81]

Engaging in everyday activities involving numbers such as playing games or cooking have been linked to children's concurrent and later math abilities. Large-scale studies have shown math reasoning skills to be the most predictive of later performance in higher-level mathematics and analytical verbalization skills in middle school, high school, and beyond.[82] And, one of the most robust findings in cognitive psychology is that early spatial skills and language predict later math achievement and help to predict STEM careers.[83, 84] By using language as a tool to facilitate cognition, parents can also guide conversations toward math concepts to enhance their children's concurrent and later math abilities.[85 , 86]

Footnotes

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Recommended Reading

Recommended Reading

Actively Engaging:

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Meaningful:

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Socially Interactive:

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Joyful:

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Data from Learning Landscapes sites (continued):

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