Design, Make, Play: Growing the Next Generation of STEM Innovators is a resource for practitioners, policymakers, researchers, and program developers that illuminates creative, cutting edge ways to inspire and motivate young people about science and technology learning. The book is aligned with the National Research Council’s new Framework for Science Education, which includes an explicit focus on engineering and design content, as well as integration across disciplines. Extensive case studies explore real-world examples of innovative programs that take place in a variety of settings, including schools, museums, community centers, and virtual spaces. Design, Make, and Play are each presented as learning methodologies that have the power to rekindle children’s intrinsic motivation and innate curiosity about STEM (science, technology, engineering, and mathematics) fields. A companion website (dmp.nysci.org) showcases rich multimedia that brings the stories and successes of each program—and the students who learn there—to life.

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CHAPTER 7

THE ULTIMATE BLOCK PARTY
Bridging the Science of Learning and the Importance of Play

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The Play Crisis

We are in the midst of a crisis. A play crisis. Play is a rapidly diminishing staple for today’s children. From 1981 to 1997, children’s playtime dropped by a staggering 25% (Hofferth & Sandburg, 2001). A more recent analysis shows that this low level of play was maintained between 1997 and 2003, but that during this time, children spent more time studying and less time outdoors, playing sports, or involved in passive leisure activities (Hofferth, 2009). Despite scientific findings that link play and recess to increased levels of attention and increased learning (for a review, see Hirsh-Pasek, Golinkoff, Berk, & Singer, 2009; Pellegrini, 2005; Pellegrini & Davis, 1993; Pellegrini, Huberty, & Jones 1995), recess has been eliminated in thousands of schools in the United States to allow for more time for academic study (Elkind, 2008). Dr. Edward Zigler, father of the Head Start program, has written that “play is under siege” (Zigler, Singer, & Bishop-Josef, 2004).

The issue is not simple. Much of the pressure to increase time spent in school and decrease play is fueled by international test results which found U.S. 14-year-old students, rank 17th among industrialized nations in reading, behind Finland, Poland, and Japan; 23rd in science; and 30th in math, 13 slots behind Slovenia (Fleischman, Hopstock, Pelczar, & Shelley, 2010). While our paltry rankings are not news, what is news is that science has made major progress in uncovering how children learn. The last three
decades of science of learning research has produced a wealth of empirical
data that highlight the power of play on development. Ginsburg et al.
(2007), in a white paper for the American Academy of Pediatrics, emphasize
that free and unstructured play is essential for all domains of development—
not just physical health. Free, unstructured play helps children reach
physical, cognitive, and social milestones. Further, it aids in managing stress
and promotes resiliency. Play is imperative if children are to thrive in a 21st-
century world. As the world has changed, so too have the knowledge and
competencies needed to succeed—such as creativity, critical thinking,
collaboration, communication, confidence, and content—all of which begin
in the sandbox during play and take us to the boardroom (Herish-Pasek et al., 2009; Hirsh-Pasek & Golinkoff, 2010).

Playful learning, encompassing both free- and guided-play activities,
provides children the opportunity to actively engage, explore, and discover
the world around them and integrate their learning based on principles
defined by developmental psychology and learning sciences research
(Bransford, Brown, & Cocking, 2000; Fisher, Hirsh-Pasek, Newcombe, &
Golinkoff, in press; Melzoff, Kuhl, Movellan, & Sejnowski, 2009). Free-play
activities—those that are fun, voluntary, flexible, have no extrinsic goals,
involves active engagement of the child, and often contain an element of
make-believe—allow children to practice new skills, test out ideas, and
expand their play (Johnson, Christie, & Yawkey, 1999; Pellegrini, 2009;
Sutton-Smith, 2001). From dress-up to stacking blocks to creating art,
research suggests that free play fosters mathematics, language, and early
literacy in children from diverse backgrounds. Additionally, children learn
and practice how to share, communicate with others, focus attention on a
task, test new ideas, and generate novel solutions—all of which are necessary
for later academic success.

In guided-play contexts, adults create flexible, interest-driven, child-
centered play experiences that encourage children’s natural curiosity,
engagement, and thinking (Fisher et al., in press). Adults are seen as collab-
orative partners who actively facilitate the learning process in at least
two ways (e.g., Berk, 2001; Vygotsky, 1978). First, adults might enrich the
environment with objects or toys that provide self-driven experiential
learning opportunities and focus children on the dimension of interest. To promote spatial thinking, for example, adults may put blocks in
a child’s free-play area. Second, adults may facilitate children’s learning
by gently scaffolding their discoveries using a variety of techniques, including
commenting on children’s insights, co-playing with them, asking open-
ended questions, suggesting ways to explore and play with the materials in
ways that children might not have thought to do, or creating games that
help them hone their knowledge and skills (e.g., National Research Council,
2009). Building on the previous example, an adult may challenge children
to “design and build the tallest skyscraper” in the room and, after the activity,
ask children to compare skyscrapers and figure out why some toppled over
while others did not. Evidence shows education programs that incorporate
free- and guided-play activities, such as Tools of the Mind and Montessori,
promote long-term academic achievement (e.g., math, vocabulary) as
well as increased inventiveness, curiosity, social skills, and motivation
beyond traditional, structured programs (e.g., Alferi, Brooks, Aldrich, &
Tenenbaum, 2011; Bodrova & Leong, 1996, 2001, 2007; Burts, Hart,
Charlesworth, & Kirk, 1990; Burts et al., 1992; Diamond, Barnett, Thomas,
& Munro, 2007; Golbeck, 2001; Hirsh-Pasek, 1991; Lillard & Else-Quest,
The data paint a clear picture: the “active and engaged child”—one who
explores, interacts, and engages in the environment—is the child who is
best prepared for the future (Chi, 2009).

Despite this, 65% of children age 4 to 11 experience more than two hours
of TV a day, while more than one third (37%) experience fewer than six
active-play sessions a week (Anderson, Economos, & Must, 2008). These
same children are exposed to more highly regimented education programs
in place of play (Miller & Almon, 2009). For example, the “Baby Einstein”
phenomenon changed the environment of many homes in America. Experimen-
tal studies show that very young children are unable to learn vocabulary from educational videos (Krcmar, Grela, & Lin, 2007; Roseberry,
Hirsh-Pasek, Parish-Morris, & Golinkoff, 2009) and, in fact, increased
television watching among 8- to 16-month-old infrants is associated with
decreased vocabulary compared to little to no television watching (Richert,
Robb, Fender, & Wartella, 2010). Furthermore, television watching leads to
decreased communication between mother and child compared to book
reading or playing with toys (Nathanson & Rasmussen, 2011) across early
childhood. Despite these findings, 40% of children age 3 months and 90%
of 24-month-olds are already regularly watching screen media (i.e.,
television, video, and DVDs) (Zimmerman, Christakis, & Melzoff, 2007).
Others have found that highly structured educational activities in early
childhood result in limited, short-term gains and, in some cases, negative
effects on children’s motivation (Stipek & Byler, 2004) and long-term
academic outcomes (Marcon, 2002). Child psychologists also worry that a
lack of playtime compromises the next generation’s academic, physical,
and social-emotional health (Fisher, Hirsh-Pasek, Golinkoff & Glick Gryfe,
2008).

While science shows that play is vital for children’s learning and
development, the message is often lost in the mass commercialization of
childhood and the misguided belief that only highly structured activities
are the best way for young children to learn (Wong, Fisher, Uribe-Zarain,
Ma, Golinkoff, & Hirsh-Pasek, 2008). How might we reverse this trend? Could a group of scientists start a grassroots effort to change the culture of childhood today? Our plan was simple—channel the “block parties” of the past where families came together to share knowledge and play. In this case, we hoped to bring together the scientific community of researchers studying play, the professional community of educators, social workers, and librarians, nonprofit corporations invested in children such as museums, corporations that work with children, and most important, today’s families. Enter: the “Ultimate Block Party.”

**THE ULTIMATE BLOCK PARTY**

On October 2, 2010, over 50,000 people attended our first “Ultimate Block Party” event, held in New York City’s Central Park. With the help of a wide range of scientists, community partners, corporate leaders, children’s museums, nonprofit groups, volunteers, and even celebrities such as Sarah Jessica Parker and Mariska Hargitay, we hosted the first celebration of the impact of play on development and shared this message first-hand—from the mouths of scientists to the ears of today’s parents and families. Since then, thousands more families in Baltimore and Toronto have told us the same thing that New Yorkers did: today’s families are ready for a culture change.

**Translating the Science of Play.** The Ultimate Block Party initiative sought to transform attitudes about how children learn by demonstrating that play can foster important learning skills in science, technology, engineering, and math (STEM) as well as in literacy and the arts. Recognizing that the general public is largely unaware of the explicit connections between play and learning, we developed the Ultimate Block Party to create unique opportunities for families to experience and understand the science of learning in action. We created playful learning activities that families could engage in and linked play to learning in a variety of ways, including an emphasis on how the arts impact children’s learning.

**Playful Learning Activities and the Playbook.** The Ultimate Block Party included 28 activities spanning eight play domains: adventure, construction, physical, creative, the arts, make-believe, technology, and language play. All activities were based on the learning sciences literature and were designed to appeal to a wide demographic audience (e.g., ages, interests, learning ability including learning disabilities, and physical ability). For example, studies show that block and puzzle play promote spatial understanding and mathematics achievement (e.g., Ginsburg, 2006; Ginsburg, Lee, & Boyd, 2008; Levine, Ratliff, Huttenlocher, & Cannon, 2012; Newcombe, 2010; Wolfgang, Stannard, & Jones, 2001); hence, the “LEGO Extravaganza” activity was created for the event. Other activities were based on research originating from the NSF Science of Learning Centers (Gentner, Levin, Dhillon and Poltman, 2009).

A pivotal piece of this outreach was designed to inform parents that play is central to children’s learning. We produced an Ultimate Block Party **Playbook** that we gave for free to each family at the event, full of useful information about play. For each of the eight play domains, we introduced parents to “The science behind playing around” and also suggested “More ways to play at home!” In addition, the **Playbook** contained descriptions and a map of the locations of the Ultimate Block Party activities. It also had a list of both scientific and popular resources for more information on the science of learning. Below, we highlight a few of the events we featured and the messages we gave parents to help highlight the science behind the play. Much of the text below appeared in the pages of the **Playbook**. To view the complete **Playbook**, visit www.ultimateblockparty.org.

**Where in the World? Adventure Play**

How do young children learn to navigate or “get around” in this great big world? Psychologists find that even preschool children have the ability to learn to use a map. Kids’ ability to think about space has been linked to achievements in science, technology, engineering, and even in math. A great way to improve this skill is through fun practice using maps and thinking in space or “spatially.” The adventure play activities allow you and your child to use a map to find your way around the park, go on a huge scavenger hunt for local “treasures,” and play a big game of hide-and-go-seek.

- **Hide-and-Go-Seek (sponsored by Hali):** You will need a phone with a GPS (such as an iPhone or an Android) to play this game. Players are divided into two teams, Hiders and Seekers. Hiders must work as a team to keep each other safe, while seekers must coordinate to find and tag Hiders. The app provides a map, showing other players’ approximate locations. Seekers are given exact locations of Hiders who are far away, but as they near the Hiders they must rely on their eyes to tag them. Hiders must judge when a Seeker is too close and figure out when their location is no longer secure.

**Building the Future: Construction Play**

How do cars work? What holds up a house? Kids love to know how things are made. But did you know that giving kids the chance to build things (such as a block tower) also helps them learn about shapes, space, patterns, and even mathematics? And if children build with others, they practice working as a team, problem-solving, turn-taking, and perspective-taking.
Giving children the chance to build (and even destroy!) new structures gives them the opportunity to become child-engineers! Imagine the wonder! How did those small pieces come together to build something so large and wonderful? The activities in this section will allow you and your child to experience this wonder first-hand. You will get the chance to create a CLICK moment using LEGO CLICKs, build your own tallest skyscraper, race a one-of-a-kind model car, and even create your own playground!

- **LEGO Extravaganza** (sponsored by LEGO; Figure 7.1): Families will have an opportunity to build an original design by themselves or become part of a team of builders. The foundation of the activity is a blog (www.LEGOclick.com) that serves up daily musings on those daily moments of brilliance—the “light bulb” or CLICK moments—when ideas just seem to come together. From innovative activities and experiences to new inventions to everyday fixes, CLICK moments are the intersection of creativity and problem-solving, and often go unnoticed. For a child, a CLICK moment occurs when he or she snaps the last brick on his or her LEGO creation and declares, “I did it!” These moments nurture patience and persistence. The reward is a sense of accomplishment and a self-esteem boost that is the foundation for a lifetime of creativity.

- **Imagination Playground** (sponsored by KaBOOM!; Figures 7.2 and 7.3): Imagination Playground is a breakthrough play-space concept conceived and designed by architect David Rockwell to encourage child-directed, unstructured free play. Imagination Playground offers a changing array of elements that allows children to constantly reconfigure their environment and to design their own course of play. Giant foam blocks, mats, wagons, fabric, and crates overflow with creative potential for children to play, dream, build, and explore endless possibilities. Kids learn how to use their imaginations and foster their building skills as they create houses, barns, and simply interesting block configurations. Social skills are also enhanced as kids who have never met before team up to make something together.

- **Skyscraper Challenge** (sponsored by NSF’s Science of Learning Centers and in collaboration with the Chicago Children’s Museum): Design your own skyscraper and enhance your understanding of the science, engineering, art, and technology behind what keeps the world’s tallest buildings standing! Using a variety of materials resembling a large plastic erector set, children were encouraged to build the tallest skyscraper while exploring their knowledge of physics. After constructing their tower, children were asked if it “wobbles,” and learned that structures built with a cross-brace for support were much stronger than those built without. What a fun way to become scientific engineers!
Get Moving! Physical Play
Following rules, learning self-control, even learning to count—these are things that can be learned through play. When we play games, we add pleasure to the task of mastering our minds and bodies: “Put your hands on your head”; “Simon says, touch your ear.” In this seemingly simple task, if you know to touch your ear but not put your hands on your head, you are practicing “executive functions” like regulating and controlling your impulses. Research suggests that self-control is critical to success in school. And, as you might guess, when you pay attention, you will perform your classwork better and will also be better at forming friendships. The activities in this section will get your body moving and your brain learning!

- **Pop-Up Adventure Playground** (sponsored by the New York Coalition for Play): Children need to be in charge of their play! At the Pop-Up Adventure Playground, kids have permission to create their own play environments and scenarios. Do not be surprised if kids continually transform this space throughout the day. Children will encounter an assortment of materials such as planks of wood, cardboard boxes, lengths of fabric, mixing bowls, sand, water, leaves, and branches. Stand back and enjoy your kids using this stuff to construct whatever they desire—hideouts, forts, flying ships—the sky is the limit! The play may be loud or quiet, silly or serious. One thing will be true: kids and their imaginations will rule!

Just Add Imagination! Creative Play
Kids love to create—new works of art, music, and dance! Being creative and exercising their imagination is important for kids to become better observers and innovative thinkers. Practicing drawing and painting when you are little helps you learn how marks on a page can express your feelings and ideas. Creating art lets children imagine worlds that might be and songs that never existed. In this section, you find that art can come from everyday materials such as cardboard and sidewalk chalk. Create your own brain art using a seven-foot 3D sculpture, and then design your own kite.

- **Brain at Play** (sponsored by Children’s Museum of Manhattan; Figure 7.4): Children’s Museum of Manhattan (CMOM) asks: “How does play make the brain hum with activity?” Children paint, collage, and draw on a huge 7-foot, interactive, three-dimensional sculptural “brain” that sparks the connection between play, creativity, and healthy brain development. Pulsing lights flash and portals strategically placed throughout the sculpture inspire children to send “play messages” into the large brain, creating documentation of thousands of children’s favorite play activities. These play messages were posted on CMOM’s website after the event to help families discover how important play is to their children and inspire them to find new ways to play (www.cmom.org).

Got Rhythm? Music and Dance Play
Music is a language all its own. Emotions, feelings, movement, and ideas are all invoked and expressed through music. Plus, getting up to dance to the beat helps children be active and exercise their bodies. The activities in this section enable children to find their rhythm.

- **Sesame Street Sing-a-Long** (sponsored by Sesame Street): Come sing along to some of your favorite classic Sesame Street songs with “Gordon” from the Emmy Award-winning series on PBS created by Sesame Workshop. Music can be a playful and engaging way to help children learn about and explore their world as they strengthen their language and literacy skills, develop academic skills, enhance their social and emotional development, and foster artistic confidence and creativity.
pretend they are chefs, create their own placemats, cook imaginary meals, wait on tables, dine, make change, and much more at the Let’s Play Café. As children play with their friends in this rich learning environment, they are rehearsing real-life experiences! They negotiate who will be the cook and who the customer at the restaurant, they practice communicating their ideas and feelings to another person, they learn how to balance their wants/desires with those of other children, and they practice sharing. But that is not all! They also gain skills in math, hand-eye coordination, creativity, and problem-solving. This play-and-learning destination is sure to delight children and their families.

Tech-Time! Technology Play
Children specialize in “why” and “how” questions: “Why did my ice cream melt?” “How does it snow?” Children are natural-born scientists who conduct little experiments each and every day. When children question the meaning of events and why they happen, they are improving their powers of observation, reasoning, and prediction while generating excitement about science. Thinking scientifically also fosters creative thinking and hypothesis-testing as children ask themselves how and why a particular thing occurred. And just like scientists, children learn from their successes and their failures.

For instance, recent work suggests that even short-term music training may improve preschoolers’ performance on tests of verbal intelligence and executive function (Moreno et al., 2011).

Pretend Worlds: Make-Believe Play
How do kids learn to control their behavior when they feel sad or mad or just plain rotten? They play! Scientists tell us that letting kids engage in make-believe gives them a chance to work through their feelings and figure out good ways to respond. Playing make-believe helps children control their thinking and behavior. This “self-regulation” ability is important for kids to learn for future success. Self-regulation goes beyond learning to walk away from the cookie jar when dinner is almost ready. Self-regulation helps kids develop persistence, master tasks, cooperate with you and others, and make good moral choices. Through becoming a restaurateur and consulting with The Muppets’ Swedish Chef, and even through practicing “clowning around,” kids learn to do the right thing.

- Let’s Play Café (sponsored by the Goddard School; Figures 7.5 and 7.6): Make a reservation at this special make-believe restaurant! Children can

Figure 7.4 “How does play make the brain hum with activity?” was the question posed at the Brain at Play activity. Children gladly answered on this huge 7-foot, interactive, three-dimensional sculptural “brain.”

Source: Diane Bondareff.
Say What? Language Play

Language makes humans special. Spoken and written language allows us to communicate, pass on our traditions and stories, and form relationships with those around us. Research has shown that the amount of language children hear addressed to them—from birth on—influences not only their vocabulary size, but also their school achievement. Language lets children interact with others, express their emotions, and learn about the world. Learning more than one language is easy for children if they are immersed in it and is a gift that lets them participate in an even larger world. For all children, being able to read opens up the universe!

- *Bilingual, Bicultural, Brilliant!* (sponsored by the University of Washington’s Institute for Learning and Brain Sciences): Why is it cool to know more than one language? And why is it so much fun to play language games? The activities here demonstrate the benefits of being bilingual and bicultural through simple games and activities. For instance, playing bilingual bingo will demonstrate that speaking more than one language can help children and adults be more flexible thinkers. Children and parents who speak English, Spanish, or a combination of both languages will really enjoy these games.

Facilitators at the Ultimate Block Party

**Volunteers.** Over 100 volunteers from the community, ranging from high school and college students to teachers and parents, this large cadre of volunteers manned each of the 28 activities at the New York Ultimate Block Party. They were excited to be part of something that brought the word of playful learning to families and were eager to share in this unique opportunity. They were offered materials on the web to read about what the activities offered and how to help parents understand the value of play.

**Play Doctors.** Members from the NSF-funded Science of Learning Centers and others from the scientific community acted as *Play Doctors* who walked around interacting with families and children. Their primary goal was to facilitate the public’s understanding of how play relates to children’s learning and development based on scientific research. They wore white lab coats decorated with colored handprints and messages about the importance of play. They also wore pins that said “Play Dr.” so that families could identify them as targets to ask questions about the activities.

**Experts.** Professionals from a wide array of backgrounds, including art, music, law, architecture, finance, museum education, media, and toy companies, acted as *Experts* stationed at the various activities. Experts interacted with children and families, sharing stories about how their play activities promoted interest in their chosen careers.
ASSessment and Outcomes

Whom Did the Ultimate Block Party Reach?
The goal of the Ultimate Block Party was to convey the message about the power of play and the science of learning to the community at large. The original Ultimate Block Party event in the Naumburg Bandshell in Central Park, New York City, attracted over 50,000 attendees—82% of whom lived in New York City. Importantly, the event attracted a wide range of attendees of different races and ethnicities: 44% were non-white, and many resident New Yorkers commented that this part of Central Park is most frequently visited by an upper-class and largely white population. Many of those interviewed said that the Ultimate Block Party was a destination rather than simply something that they happened upon in their own neighborhood. Notably, the “age of oldest child” of about half the Ultimate Block Party participants was 5 years or under. Research suggests that early childhood experience is a key factor in later emotional, psychological, and academic development (as reviewed in the May 2010 issue of Archives of Pediatrics & Adolescent Medicine). In addition, our June 2011 Ultimate Block Party in Toronto, Canada attracted over 5,000 attendees, and over 10,000 people attended our October 2011 Ultimate Block Party in Baltimore.

Further analysis revealed that our reach was far greater than the number of attendees. By involving community partners, engaging in a press campaign, using social media, and working hard to contact as many people as possible both before and after the event, our public relations partner estimated an on-air or online reach of millions, print circulation of over 1.8 million, and an estimated print audience of more than 4.5 million. Since the event, the Ultimate Block Party has been featured as a full-page story in the New York Times, as a cover story in the Christian Science Monitor, and a story in the Chronicle of Higher Education. The media appear to be supportive of this message, and engaging with local and national news organizations can only help spread the word about the power of play.

Did the Ultimate Block Party Work? Assessing Beliefs about Playful Learning
A key goal of the Ultimate Block Party was to change parents’ beliefs about the value of play to learning. A team of researchers from Sarah Lawrence College and Yale University conducted an external assessment of the event to examine the messages conveyed to attendees, how its organization was viewed, and, more generally, people’s attitudes about play, to be used for future endeavors and outreach. The research team interviewed 258 parents or caregivers who attended the Ultimate Block Party event in New York City and Ultimate Block Party volunteers. One objective was to learn whether attendees’ attitudes about play changed and, if so, whether change depended on the number of activities individuals visited. We asked questions about the perceived relationship between play and learning. We wanted to discriminate between those who believe play leads to learning versus those who do not. Among those who participated in one activity, only 50% reported this direct relationship. Among attendees who visited two to three sites, 62% reported this relationship, while 83% of those visiting four or more sites reported the same. Thus, the more interaction participants had with the Ultimate Block Party activities, the more they believed that play leads to learning. Furthermore, participants made direct connections between certain activities and learning, demonstrating that they understood the value of spatial learning as instantiated through block play and a geo hide-and-seek game.

Lessons Learned from the Ultimate Block Party
Since the original Ultimate Block Party in New York City, we have hosted two other parties—one at Fort York in Toronto and one at the Inner Harbor in Baltimore. After three Ultimate Block Parties, we have learned a number of lessons that can be applied to any design, make, or play event.

- Power from the people. The Ultimate Block Party would not have been possible without the contributions of countless numbers of individuals. Early on, we relied on guidance from our scientific and business advisory boards, who participated in the formation of this event from the ground up. Our scientific consultants helped make sure that all our activities were based in science and that we were fulfilling our mission of bringing science into the hands and homes of today’s families. Because of the scope of the event, we had outside help with public relations and marketing; we also had a production company to help make sure that this massive event went off without a hitch. One of our key partners in the NYC Ultimate Block Party was the Children’s Museum of Manhattan. This well-established, trusted, and well-connected partner not only shared our vision, but also facilitated cutting through some of the red tape that inevitably stands in the way of any community endeavor. Our Baltimore Ultimate Block Party was partnered with Baltimore City Public Schools, which allowed us to tap directly into a large school district and highlight this event to underserved communities. The Toronto Block Party occurred in partnership with the Ontario school system, which was heralding its new play-based curriculum.
- **Involving community organizations.** One surprising but unintended outcome was what happened when the Ultimate Block Party brought together community organizations and partners to plan the Ultimate Block Party. This was often the first time these community organizations had come together around the same table. We often heard these groups make additional plans to work together—both in preparation for the Ultimate Block Party but also for future events. The planning committees in all our locations reported that they simply were not aware that so many people, so close by, shared a passion for the promotion of learning and play in childhood.

- **Communication is crucial!** To have a well-attended Ultimate Block Party, communication must happen early and often with a wide range of constituents. Each Ultimate Block Party was up to two years in the making. Over these two years, innumerable emails, phone calls, and emergency meetings occurred to make sure every last detail was covered to ensure successful events. A massive community event requires that everyone—from the event planners to the security staff to the cleanup crews to the legions of volunteers—be on the same page. This means that from the beginning, everyone involved must develop a communication style that works and must be willing to change it as the project changes. What started as a few emails and phone calls between five to 10 people very quickly became a 100-plus-person effort that required constant communication.

- **Professionalism.** We learned that a high-end product commands respect. We made the decision to have at every juncture a consistent brand that was accessible, high-profile, and understatedly elegant. This was indeed an event about parents and families, but it was also one that preserved scientific integrity by offering the finest learning activities. Our production company utilized professionally made signage that lined our walkways and surrounded the event, making it clear to all participants that there were individual activities that were part of a consistent and thoughtful event (Figures 7.7 and 7.8). The look went beyond “street fair” to create more of a museum-moves-outdoors kind of feel. The Playbook, too, was published on shiny, glossy, heavyweight paper, and the website has a clean, very sophisticated yet playful look. Playing, making, and designing is serious business and needs to look that way to be taken seriously.

- **Training.** Any community event will benefit from the help of volunteers, but only if these volunteers are well informed to help make a difference in their community. One core aspect of the Ultimate Block Party was incorporating the help of many volunteers. We had two different types: professionals (i.e., researchers and scientists) and community members,

*Figure 7.7 We utilized consistent branding/signage to identify different activity centers to help families navigate through the park.*

*Source: Rachel Weaver Rivera and Lisa Sullivan.*

and we did not expect everyone to know how best to interact with families in the community. So we trained them. We equipped our Ultimate Block Party volunteers with an extensive handbook outlining our event, our goals, and their responsibilities. We used YouTube to share our goals and aspirations for our volunteers’ participation. We also outlined ways to help maximize their impact by advising them on how to interact with a variety of families. For example, we instructed
our volunteers to engage in discussion with parents about the motivation of the Ultimate Block Party movement, to point out the learning that existed behind their child’s play at the activities, and to highlight ways in which the Playbook could help them bring the lessons home. The sheer number of volunteers allowed us to maintain a “presence” throughout all the events to help parents and families learn how important play is in their children's development. Local researchers and professionals and interested community members help expand a dedicated staff. From lending scientific expertise to pointing people in the direction of their choice event, volunteers make an event shine.

- **Social media is your friend.** One of our main Ultimate Block Party objectives was to maximize the number of people who heard about our
Bridge the gap. One main focus of the Ultimate Block Party was to bridge the gap that exists between today's families and today's scientists and researchers. We wanted to bring the science of play to everyday life. To do this, we charged a scientific advisory board to help us ensure that the science supporting the event was strong and accurate and reached out to local scientists to serve as volunteers and Play Doctors on the day of the event. Local universities can offer scientists (oftentimes in psychology, education, or human development departments) who want to be involved and can contribute to the playing, the making, and the designing. These researchers have often dedicated their careers to finding out how children learn about the world, and many are elated to work closely with their community. They have access to the latest scientific research and can help distinguish between "hype" and the real science that exists.

Moving Forward: Playing for the Future

The Ultimate Block Party is a new approach that puts the science of learning into the hands of families, practitioners, educators, and policymakers. To date, our proof of concept demonstrates that a highly professional approach that allows people to experience learning through play activities is attractive to families of all races, ethnicities, and income levels. It is a concept that travels well across borders and promises global reach and local flavor. And it emphasizes the value in the lost art of play. Society appears ready not only to hear this message, but also to participate actively in this change. The Maker Movement is another stellar example of a grassroots effort that is quickly causing large-scale changes in thinking. In 2006, 20,000 makers—crafters, builders, artists, engineers, researchers, and scientists—gathered in San Mateo, California to celebrate do-it-yourself play of all types. Only five years later, 100,000 makers joined in the play, and two additional sites held their own Maker Faires. From the inaugural success of the Ultimate Block Party in New York City and other cities to the practical explosion of the Maker Movement both nationally and internationally, one message is clear: Society is ready for change—and people are ready and willing to design, make, and play their way into a better future.

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REFERENCES


This project began when I posed a simple question to an undergraduate research student: Can we create play dough conductive enough to build circuits with? This was quickly followed by more questions: If so, what could we do with it? What could others do with it? My research over the last few years has been focused on engineering education at the pre-collegiate level and incorporating play into engineering, so the idea of sculptable circuits was intriguing. While previously existing primarily in rigid board form, circuits can now be sewn and painted (Buechley, Elumeze, & Eisenberg, 2006; Buechley, Hendrix, & Eisenberg, 2009; Qi & Buechley, 2010). Many adults, myself included, have fond memories of playing with play dough, and we thought it would be fun to add electronics to this activity. Could we make circuit building as playful, and intuitive, as manipulating play dough? If so, would this be appealing to individuals, particularly children, who may have no previous exposure to electronics?

Play dough was particularly enticing to our research group because it is something that most children have experience with. Homemade play dough is cheap and relatively easy to make. Additionally, play dough is non-permanent—if you do not like your creation, you can squish it up and start over. Our hope was that by combining something as familiar and easy to use as play dough with electronics, we could create an activity in which circuits could be explored playfully and easily.

Play dough has previously found a place in the physics classroom, typically in resistance-measuring labs (Jones, 1993; Watson, 2000). There, exercises often involve students measuring the resistance of play dough tubes. At the beginning of the Squishy Circuits project, these resistance labs