Do you still play? When experimenting in the kitchen, do you explore the combination of ingredients to invent something new? When at the park, do you feel the physical freedom and exhilaration when floating on a swing? When designing on the computer, do you lose yourself for hours in color and image? Is design play to you? Danish play researcher Karen Feder explains:

Play and design have a lot in common – it is imaginative, creative, explorative, iterative, meaningful, emotional and engaging. Remember how it was when you were a child, and you forgot all about time and place because you were so immersed in playing? To reach a “play state” – you have to go through the design process with an open mind, let yourself be surprised and embrace unexpected opportunities. This requires a safe and trustful environment – as play does – and an understanding of the process as an essential journey for the creation of meaningful design.1

Play begins in infancy, and small children spend much of their time testing hypotheses in play, helping with the mastery of skills. From an evolutionary perspective, the primary purpose of play is education. Humans are mammals, and children, like all other young mammals, play to practice all types of skills they will need throughout life, including survival skills. While young monkeys play at chasing one another, swinging from trees, human children chase each other in a playground in a game of tag. Someday, children may need to have experienced risk so that they can run to protect their bodies.2

In later childhood, most children play less than younger children, and today even less than they have in our most recent previous generations. This deprivation of childhood is harming many children.3 This is one of the most significant challenges for designers, educators and everyone involved in the world of creating for play. The view that play is essential for survival and personal growth is in sharp contrast to the organized, extrinsically motivated, time-restricted activities children experience more commonly today to support growth. While the time for play is decreasing, designers are finding other opportunities to sneak in play throughout childhood. Since most kids enjoy play, almost everything designed for them could be considered and conceptualized through the filter
of play. A medical device designed for kids can encourage them to engage in an active experience to heal. Teaching educational content through interactive media, a silly story, can motivate kids to learn. A playful approach to graphic design, music or toys can communicate healthy messages.

Play and Culture

Play is universal. Children’s brains are wired to learn through play. All kids around the globe participate in play. The time allowed and the attitude toward play activities vary widely in different cultural contexts. Rena Deitz, senior education specialist at International Rescue Committee, who has worked with refugee children, explains: “In camps, there is a lot of dead time, and there is more time to do things around play. In urban areas, it is harder. There is the reality of doing chores and working. Many kids don’t have time to play.”

Play is recognized as being so important to the development of children that the United Nations High Commission on Human Rights in Article 31 has recognized play as a fundamental right of every child, whether or not the culture in which they are socialized acknowledges, supports or sets aside time for play. Through play, children learn societal roles, norms and values. Many play patterns are similar from culture to culture, although the way children play and what they play with may differ. When a natural disaster occurs, at refugee camps or in war zones, in addition to food and water, non-profits also supply soccer balls and other play tools to provide opportunities for kids. Kids need to play to feel whole.

Structural aspects of the immediate environment – time, space, availability, social environment, parenting styles – are all factors affecting the frequency, duration and nature of play activities. For example, in Asia, cultural influences tend to see play and academic activities as separate from each other, although in
Italy, there is little distinction between play and children's other activities, and they strongly emphasize social interaction in children's play. As designers, it is essential to understand the values around play and design culturally appropriate products, experiences and environments. Here are some attitudes towards play across the globe.

Play as …
- a process of learning
- a source of possibilities
- empowerment
- creativity
- children's work
- fun activities

The LEGO Foundation continually develops and publishes research around play and is a great place to start when conducting research for a project.6

Play is fundamental to modern childhood and the way in which many children develop knowledge of their bodies, personalities, identity and social skills through exploring different play patterns. Many current theories of child development, education and parenting are based on the idea that play offers the experience for a child to construct learning rather than being the passive receiver of knowledge. What is the draw of play for kids? I have asked many kids of different ages what they like about play, and this is what they said:

- “It is fun,” Joshua, age 3
- “It’s fun,” Sam, age 9
- “I feel good when I play,” Olivia, age 6
- “I don’t know; it’s just fun,” Carlo, age 7
- “I like it,” Layla, age 5

I think we can all agree that fun is the most significant appeal for children. What they are explaining is play as a state of mind. Our designs drive that mindset. Play researcher Karen Feder suggests that designers consider this question:

Why do we need to design for play? Play is the construction of our (western) world and the way we have chosen to live our life, constraining us as human beings, so we need to create a kind of fake reality to play with and upon? For instance, why do we need to design artificial playgrounds, and make them look like nature? Why don’t we just prioritize wild nature in our surroundings? Maybe we can do something better or different with design, but the important thing is to constantly keep in mind, why we are designing for play.7
Defining Play

We all know it when we see it, but can play be defined? Even experts in the field who study play have a hard time agreeing on a definition. At a recent conference, I attended a lecture by Dr. Stuart Brown, the founder of the National Institute for Play. He defined play as a separate state of being. “In play, we identify innate talents and intrinsic motivations. It is important that we learn what our talents are and nourish them.”

Play is an attitude. A confluence of characteristics define play. We must look at the motivations and mental attitudes towards the activity and why they are doing it, not the behavior. Two people might be throwing a ball, and one might be playing and the other not.

Play is usually defined along a continuum of more play value or less play value. The motives and attitudes can range from 0% to 100%. It is impossible to accurately quantify precisely how playful an approach is based on an experience, but we can use criteria and methods such as observational research, playtesting and interviews to determine priorities, how engaged someone is in an activity, and whether our project meets the requirements we set. A behavior that brings forth an attitude that satisfies a more significant percentage of these characteristics would be considered by most people to be more playful, while one that meets few criteria could be referred to as less playful.

1. Play is freely chosen, self-directed and spontaneous. The person playing is always free to quit. It is the expression of freedom.
2. Play must be pleasurable and enjoyable. Children must enjoy the activity, or it is not playing.
3. Play is process oriented. Children engage in play solely for the state it brings.
4. Play has structure or rules that emanate from the minds of the players. All players must freely accept the rules, either their own rules or ones created within the group.
5. Play must be intrinsically motivated. Hybrid forms of work and play such as a goal-oriented assignment by a teacher that includes active engagement and intrinsic motivation can also be play and produce playful learning.
6. Play is non-literal and imaginative. Play involves an element of conceptual constructs or make-believe.
7. Play requires active engagement on the part of the players. Children are physically and/or mentally alert and involved in the activity with a relatively relaxed or excited frame of mind.

These criteria are not only useful to experts who study play but also helpful for designers to consider when developing insights during designing for play. A design that includes high play value appeals to different types of users or lengthens the life or usability of a design and would be considered by many
to be a better design. A design that has more play value would most likely be stronger than a design that has less play value in the eyes of a kid. Even better if it meets all sustainability and ethical criteria, and has a positive social impact. Paul Levine, CEO of Play Science, suggests: “Designing for play is hard fun. To design intrinsically motivated, fun, scalable and marketable play is challenging. There is complexity to it. You need to think about whom you are designing for, the context, platform, form factor, structure, positioning, and distribution.”

Design Prompts: Play Value

Ask yourself these questions throughout the stages of the design development process.

• When you are developing your design concepts, how many of these play criteria can be achieved within a single concept?
• Can you dive deeply into one of these play criteria and add several layers to make a multi-tiered engaging experience?
• Focus on the design of the scenario of play (play experience). How would a kid play with it? What steps might they take? How might they differ depending on their personality? Interests?
• Can spontaneity or something unexpected be added to the project?
• Can play prompts be added to leave space open for the child's imagination?
• What kind of rules might a child create at different developmental stages?
• How will a social group of children differ at various stages?
• How can this project include sustainability, meet ethical criteria and have social impact?

Benefits of Play

Learning through play is a term used in both education and psychology to describe how a child makes sense of the world they are living in. Play researcher Karen Feder explains:

Play is something we can’t live without, so it is essential that we nurture and ensure to keep on creating high-quality play experiences – not only for children but all human beings. Children are not only adults in the making, they are human everyday, and deserve to be treated with respect for their value in themselves.

Play meets the needs of the whole child directly and indirectly. As they play, children are improving cognitive abilities, honing communication skills, building creativity, processing and expressing emotions, developing physically and
enhancing social skills. Dr. O. Fred Donaldson explains: “Children learn as they play. Most importantly, in play, children learn how to learn.”

**Physical Development**

Play fuels brain development and production of the neurotransmitters essential for growth and learning. It is multisensory and engages the child through various inputs. Children develop fine and gross motor skills. It supports strength and fitness.

**Social and Emotional Development**

As children learn to play in different-sized groups, they learn about appropriate behaviors within particular contexts. Play helps children figure out the complicated negotiations and compromises of social relationships. They learn which behaviors are morally or culturally acceptable and which are not.

Children learn about themselves: what they like and don’t like and about different aspects of their identity. They gain emotional awareness and learn how to regulate their behavior, become independent and resilient in the face of a challenge, and build self-confidence; feelings of happiness, power over the environment, sensitivity to others, emotional strength and stability, spontaneity, humor, beliefs about self, and to manage fear, anger and frustration.

**Cognitive Development**

Play puts children into a present, attentive, focused, receptive, integrated state. Play provides a strong foundation for intellectual growth and creative thinking, and builds problem-solving skills and academic knowledge. Kids develop language skills, verbal judgment, reasoning and symbolic thought. Play builds the foundations for exploration, hypothesis testing and discovery for later learning. It allows children to imagine and discover, and introduces them to new situations, ways of thinking and environments. By touching this creative side, the children learn what they like to do, what they are good at and what they dream of being good at.

Consider these aspects of child development in your design. For example, say you are developing a baby toy that helps with physical development. Instead of just stopping there – elaborate. How can the toy strengthen different muscles to improve gross and fine motor skills? Which muscles have you chosen to develop, and why? How many other senses can you engage? Talk to a pediatrician. Knowing that a baby will put it in their mouth (after it has been on the floor), can it be made of an antibacterial material? Can you add a pretend play or storytelling element?

If you are developing a design that focuses on improving cognitive development, don’t just stop there – keep going. What in the brain is getting wired?
Is it producing a learned skill, such as a language, or one that requires executive function development, such as the ability to control behavior? Can it do both at the same time, one as a primary objective and the other as a secondary benefit? Asking these questions will lead you to further research solutions that already exist, knowledge about the world you are designing for, and insights into what is needed to support growth. Look at academic journal publications and recently released studies. Start from where others have left off and develop new and better solutions.

**Structured, Guided, Free Play**

Do you learn more when you have a rigid assignment with detailed goals and deliverables, or do you prefer to make up your own? Do you like to have a mentor teaching you a new concept or skill, or would you rather figure things out through tinkering? Do you want to be a design entrepreneur, or would you prefer to work for a company? We all have our preferred methods of designing, and most likely the way we like to learn and work is rooted in the natural way we played as children.

These types of play pertain to the level of structure imposed on the play activity, ranging from a lot of structure to none at all. It is essential to focus on the quality of the play experience. In quality play, a child is engaging entirely and has a heightened ability to learn. If you have spent time with young children, you are aware that they are known to jump around from activity to activity, room to room, indoors and out, what seems to be every minute. Before you know it, there are puppets, blocks, toy cars and dolls scattered around the house and yard. Quality play has excellent benefits by expanding the child’s attention span and ability to stay focused on one activity, go into more depth and stay interested because they are exploring, figuring it out and accelerating concepts. They are making connections and advancing understanding to build upon.

**Structured Play**

Generally speaking, when a child is engaging in structured play, learning happens through accomplishing goals by achieving pre-existing objectives. Most games with rules fall under this category: card games, board games, puzzles, classic outdoor games like tag, organized sports and model kits are structured. Rules are put in place to govern the choices of the players, identify courses of acceptable action and challenges, and give feedback.

**Guided Play**

Guided play is when adults or more experienced children facilitate playing. Parents and educators can offer more targeted learning experiences. The adults may set up the environment or participate in the play. The adult’s role varies depending on
their goals and the child’s developmental level. When setting up the experience, they may provide objects, materials or an agenda with very little involvement. They may also participate as a co-player by asking questions, commenting or expanding on activities. Digital play can also be considered guided play.

**Open-ended Play**

Free play provides children with true autonomy to help them develop a lasting disposition to learn and freedom to explore and discover their interests, skills and mastery. Controlling the course of one’s learning promotes desire, motivation and mastery. It allows maximum exploration and heightened imagination. There are often unexpected twists and turns that can keep the play going for an extended period. Children engage in free play that flows without set rules or expectations.

It is much easier to design for structured play and guided play than for free play, because you can control more of the experience through rules and process-oriented tasks. When creating for free play, think through as many of the possibilities as you can and then embed prompts and features in the design to promote them.

**Design Prompts: Creating Quality Play**

- When designing for structured play, set up the rules of engagement. Break down the steps into tasks. What goals need to be achieved? How are they proven to be successful?
- When designing for guided play, ask: What is the role of the guide? The child? Is it a collaborative or directed experience? What kind of prompts can the guide use to promote further exploration?
- When designing for free play, try to leave as much as you can to be open-ended and up to chance. Imagine many alternative play scenarios and embed features in the design to bring those out.

**Individual and Social Learning**

Social play emerges over the development of the child.

**Solitary Play**

This is the primary play pattern for babies and young toddlers and most often seen before the age of 2 to 3 years old. The primary focus of solitary play is on exploration and learning how to do things. Playing alone gets refined and decreases throughout childhood while they start to increase in-group play activities. It is essential for all age groups, including older children, because it gives them the time they need to think, explore and create and to learn how to be alone.
There are many positive aspects to solitary play:

- Freedom to use the imagination
- Learning and practicing physical and mental skills
- Able to make their own rules
- Not having to meet anyone else’s expectations
- Being fully engaged in an activity
- Exploring, creating and learning how things work

### Only Is Not Lonely

<table>
<thead>
<tr>
<th>In America, more children are growing up as only children without brothers and sisters as playmates and therefore playing alone at home for much of their childhood.</th>
<th>Parents love to see their kids being independent, being creative with ways of entertaining themselves and not depending on TV or parents for engagement.</th>
</tr>
</thead>
</table>

**Onlooker Play**

Onlooker play is when the child watches others playing but does not join in with the play.

**Parallel Play**

In this stage, the child gravitates towards other children, becomes more interested in making friends and plays next to them, while always maintaining their independence. What we observe is a child playing alongside another child or in the middle of a group, while having fun in solitary activity.

**Associative Play**

This involves social interaction between the children. Children are playing separately and may share, pay attention to others and communicate with others, but do not coordinate play objectives or interests.

**Cooperative Play**

Children engage in cooperative play with a common goal and work together to achieve the goal. This is common in older preschoolers or younger preschoolers who have been around a lot of older children. Throughout childhood, children choose to and need to participate in frequent social play to learn among their peers.

- There are many positive aspects to peer-to-peer play:
  - Builds confidence in social situations.
• Child learns to work within a group, negotiate, advocate for their ideas and deal with frustration.
• Child learns social rules such as give and take, reciprocity, cooperation, sharing and reasoning.

### Adult–Children Play Interactions

#### Social play with adults

Adults are sometimes initiators, directors and partners promoting the play experience for children to play on their own, with peers or with them. Designing play interactions between adults and children is often favorable for bonding. Consider these different levels of involvement from the adult and how a caregiver best supports the play experience.

**Onlooker**: Adults observe children from nearby and may make an occasional comment, but do nothing to enhance or disrupt play. Observation can help the adult to understand children's play interests.

**Play manager**: Adults help children set the context for various activities and offer assistance when asked. They may propose extensions to the play scenario, but children are free to follow or ignore the suggestions as they please.

**Co-players**: Co-players join in play activities. Typically adults take small supporting roles, while the child takes the lead. Co-players might extend play and often model play skills for the child, such as sharing or role-playing.

**Play leaders**: The adult actively guides children's play by doing the activity. Play leaders aim to enrich and extend play by suggesting new themes, props or plot twists to the current scenario. This involvement usually occurs to start or maintain play.

#### Design Prompts: Social Play Interactions

• Imagine play scenarios that a child might experience when they are playing alone.
• How does your design promote different forms of social interaction between peers?
• How does social interaction change with co-players of various skills?
• How does the caregiver support the play experience?
• With a single concept, develop a range of play scenarios using the benefits of solitary, parallel, associative and social play.
• What will make an adult who does not want to play engage in play?

### Designers as Play Advocates

These are individuals or organizations that speak, write or design to support the benefits of children's right to play. The reduction of play in children's lives today has brought about a movement in society to expand access to play in underserved communities, bring back play for children and support the benefits of play across the lifespan. We ask questions such as: How do we get parents to recognize the value of open-ended play and support families to spend time together and play? How do we bring more play to education and increase recess time in schools?

Instead of introducing something new, the easiest way to design for behavior change is to choose a behavior that already exists and include the new behavior. This might end up being a final solution or a transition solution. Fitting play into unexpected places and the down times in between other events is also a good start. When people are primed for play, it will be easier to test out a new solution.
Interview with Marie-Catherine Dube, HOPE Initiative, Nepal playground

Marie-Catherine Dube is a play advocate who built a playground at a Nepal school while she was a student in college. Today she designs for water play.

What were the goals and objectives of this project? When I first landed in Kathmandu – bright-eyed and eager to dive in – my goal was to design and build a playground, immersing myself in the culture of this beautiful nation I knew nothing about. As I spent more and more time living day to day with the Nepali people, studying the schools, how the children play, my goals shifted and expanded. I realized the impact that designing a social platform could have; each day on the construction site was a battle in literally convincing people not only how important play is for children but that they – the community – could create the same playspaces THEMSELVES once I’d leave after a few months’ time. The overarching goal, therefore, became to create a social impact platform advocating and empowering the child’s right to play.

What research method did you use in creating the designs? Cultural and anthropological research: Visits to schools, playgrounds, observing children on the street, how every social class would play

Childhood development research: Understanding how play correlates to early childhood development in a third world context (versus the known; a first world context)

Design, materials and engineering research: how the locals utilized natural materials available to them, the best building methods based on the climate/materials, etc., third world playground safety (in a place where safety isn’t a primary concern, how do we enforce SOME safety in the design?)

Concept testing, user testing research

How did you incorporate the research into your final design? I wanted to put in as many opportunities for growth and development as possible while staying firmly in the realm of Free Play. I hadn’t expected to add aspects of culture and social behavior into the playground but repeatedly found that these would be important in a successful final design.

Some examples of how you considered children’s behavior in the design of this project? Children’s behavior in the most rural areas was surprisingly different from what I saw in the city’s ‘expensive’...
sloths. Rough-and-tumble play was most prominent as a play type, so I had to consider ways to cater to that in the overall design. There was also ‘generic’ children’s behavior; things I didn’t necessarily see on site but through other forms of research knew were essential aspects to also design for in the final playground.

You now work designing aquatic play structures for a large company – How is your design process different from the playground you built?

Well … going from designing play spaces in a third world environment to a corporate, global company … you don’t get much further apart on the spectrum! There is one sole thing that has carried over back and forth in both types of work as far as process, and that is play (how play influences the process and outcomes).

The most significant difference is that in Nepal, the process was “trial and error then learn from it and keep trying and keep failing till you get it.” At my job now, the process is more rigid; we’re still learning every day and developing best practices, but the creative aspect of trying and failing then learning and improving (the process I used in Nepal) isn’t as strong. You need to consider, though, the two extremes: a third world country where the project is brand new versus a corporate environment that has already been researched with trials and learnings.

Splashpads are all the rage these days, replacing or being added to more traditional play environments. Can you explain from a cultural perspective why they have taken off?

Culturally for us, in North America, water is something that signifies cleanliness and life and the experience of being refreshed. In some countries in South America, for example, public water is dirty and having a communal space where everyone goes to play is not appealing. There is a huge appeal for municipalities to install Splashpads because there is typically no supervision required when there is no water depth (a pool).

Can you explain the benefits of aquatic play?

Water is such a beautiful play tool. Accessible for everyone, it adds sensory experience and development for all: from those with any disabilities to energetic teenagers all the way to grandparents accompanying a visit. It can be used to encourage high-action movement, it can be therapeutic, it draws people in and brings people together. It can teach cause and effect, it can demonstrate different textures and sounds.15

“Water provides the perfect opportunity for multigenerational play, cooperative play, competitive play, and even individual play. Play is ALWAYS beneficial; water adds even more benefits.”

Marie-Catherine Dube.

Source: Vortex Aquatics Structures (used with permission).
Play Patterns

Children have many more things to learn than other mammals and therefore, play in many different ways to learn to master them. The play patterns in this section reflect the type of activity that children typically engage in. Children usually don’t follow strict rules and categorize their play. However, creators for play do, because we try to fit what we are creating into a segment of the market or produce specific experiences or learning outcomes. Often, children combine play patterns and have a few overlapping activities within an experience. For example, a child can be engaging in physical play (running) with an object (ball) or in constructive play (building) while pretending (an imagined city). Therefore, as designers, we usually prioritize these patterns and develop a design with a primary play pattern, a secondary play pattern and so forth. The primary play pattern is usually how we message or communicate the play experience to the child or caregiver, and the secondary play pattern might be embedded in and discovered by the child. However, the secondary play pattern might represent a primary play pattern for a child with different interests. Include several layers of opportunities for play in your designs and keep them open-ended so the experience can be interpreted and altered by the child.

Attunement Play

Personal connection with others brings about a feeling of joy. Sometimes that connection comes from what is said in a shared conversation, but many times what is not stated says more than the words. We begin to learn these expressions in attunement play. A newborn and a caregiver make eye contact, exchange smiles or make silly faces. With this connection, the child experiences a spontaneous surge of joy and responds. The caregiver returns the response and may add some rhythmic vocalization or baby talk. This is the grounding base of play that begins very early in an infant’s life and continues into all stages of human development. Interactions such as winks, facial gestures, the tone of voice, the movement of a hand or the tip of a head all have meanings. Mastering the meanings helps individuals develop abilities in non-verbal communication. This is very important, because a large percentage of what our brains perceive in communication with others is with non-verbal signals. “It is known, through research using brain-imaging technologies, that the right cerebral cortex, which organizes emotional control, is ‘attuned’ in both infant and caregiver.”16

Attunement and attachment are related. A caregiver who is responsive to a child’s needs beginning in infancy establishes a sense of security within that child. The child learns that their caregiver is dependable. This creates a strong foundation on which that child can explore the world. Throughout our lives, it helps us to build and maintain our relationships with others.
Design Prompts: Attunement Play

- You’ve heard it before – A picture is worth 1000 words. Show it.
- Instead of using words to describe what you mean, convert those words into expressions, gestures, actions or icons.
- Think about the subtlety of facial gestures and the meanings they carry. How can they be used to give direction or guide the player?
- Design interactions between individuals instead of between individuals and objects.
- Can you provide opportunities for attunement in experiences?
- Can your design build on eye contact, silly faces and exchanging smiles between players?

Physical Play (Active Play)

When kids nurture their bodies physically, they also nurture their minds. Young kids don’t think about the other benefits, such as health and being fit; they move for the thrill of it. It feels good. All young mammals engage in physical play. Through physical play, children learn to control their bodies and move quickly and efficiently through space to avoid and recover from falls. Walking, running, jumping, climbing, chasing and swinging are common play activities across cultures. How can physical play also be the most endangered form of play when children naturally gravitate towards it when given a chance?
Benefits of Playful Physical Activity for Children

Physical

- Stimulates brain development, significant organ growth and increased bone mineral content
- Improved cardiovascular fitness and aerobic endurance (heart and lungs)
- Maintenance of a healthy weight
- Improved posture, balance and coordination
- Deeper and better sleep patterns
- Building stronger bones and muscles
- Gross and fine motor skills development
- Increased flexibility
- Stimulates muscle growth and improves gross and fine muscle strength
- Helps with overall integration of muscles, nerves and brain functions

Cognitive

- Boosts cognitive abilities for learning
- Improved concentration and attention when doing academic tasks
- Innovation, flexibility, adaptability and resilience
- Greater learning is likely during and after physical play
- Organized activities such as sports require sustained attention and disciplined action
- Builds skills in risk assessment
- Regular active play and exercise enhance academic achievement

Social and Emotional

- Moderate to vigorous levels of physical activity can improve executive function
- Increased self-esteem and confidence
• Provides opportunities to make friends and enhance social skills
• Help with relaxation – children are calmer for more extended periods after physical play

Babies and Physical Play

Babies playing on their own are exploring all aspects of their environment, from the sound of their voice and the feel of their body parts to those of others. They want to gaze upon, grab, suck and rattle any object that comes their way. Babies play by engaging with an object, such as reaching to hit a ball hanging from the stroller. They also play with their bodies by wiggling their feet or putting their hands in their mouths. At a few months old, they begin tummy time.

<table>
<thead>
<tr>
<th>Tummy Time</th>
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<tbody>
<tr>
<td>Babies need time on their tummies to develop strong neck muscles that will help them accomplish other physical milestones like sitting, standing, walking and crawling. A baby will naturally start trying to lift their head to see what is going on around them but won’t be able to hold it up for long periods of time until around 3 or 4 months. Eventually, the baby will use this position to roll over, scoot and support themselves with their arms. Many toys have been developed, such as tummy time mats to promote engagement during play.</td>
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</tbody>
</table>

Big Body Play/Roughhousing

In big body play, children make exaggerated actions for fun. For example, a child may jump on the bed and then slam down on to the ground on all fours. It is natural and universal in children all over the world. It is rowdy, physical, and usually loud and to many parents annoying, although a vital component of children’s growth and development. It supports the development of children's social awareness, builds both verbal and non-verbal communication skills and emotional thinking, and gives children sustained physical exercise. Through big body play, they become attuned to body gestures and learn how to control and regulate body movements and adapt the intensity to another person and how to compromise.

Rough-and-Tumble Play

We share play chasing and fighting with other mammals. Play fighting is different from real fighting. In a play fight, the intention is to go through the fighting motions without hurting the other person or making the person leave. This builds strength, coordination and endurance. Evidence suggests that girls are just as physically active as boys until age 4 or 5, but girls are better able to moderate and tone down their activity levels. Boys everywhere
engage in more playful fighting than girls.\textsuperscript{17} Play fighting is one way boys bond or learn restraint with other boys. From about age 11 onwards, rough play is less innocent and has an underlying theme of establishing a dominance hierarchy.\textsuperscript{18}

Music and Movement

Dancing, musical games and movement activities also provide opportunities for physical play that enhance children’s coordination, control and body awareness. Children can explore the elements of music, such as beat, rhythm and tempo, which can become embedded in their body memory.

Older Children

Many older children channel their physical play into individual or group sports activities. Often kids try out several different sports before they choose the one or a few that they like, and then they focus on the mastering of technique and the social component. Casual physical activities such as flying a kite, dancing, riding bikes, swimming, roller skating, skateboarding, parkour and jumping on a trampoline all are forms of physical play older kids enjoy. They also like an excuse to “play like a kid” or hang out in a playground.

Physical Play and Risk

Physical play is full of risk-taking, a fact that frightens many adults who are risk-averse. Many experts feel that this aversion is excessive and even harmful. They point to children’s natural capacity for risk assessment, which needs to be developed rather than suppressed in childhood. Exposing children to risk prepares them to meet life’s challenges.\textsuperscript{19}

The Benefits of Parkour

Interview with Caitlin Pontrella, founding partner of the Movement Creative, a nomadic studio that provides accessible fitness education and design services, focused on promoting well-being through parkour and physical play.

What does being part of the parkour culture offer kids?

Kids have intergenerational social interaction with others and the community through movement and play. It is an independent practice with several aspects of personal growth, including learning to overcome obstacles and fears. With the technical movements, kids practice the decision-making skills assessment of acceptable levels of risk. They learn how to overcome scary and difficult challenges.

How does parkour excite kids/youth at different age groups?

Kids under 12 years old are physically excited and naturally create movements in play, so they readily embrace it. From 12 to 25 years old they take it seriously and get excited to have control and power where they don’t have it in other areas of their life. They enjoy the personal choice since they don’t “have to do parkour.” They also get involved in the broader social culture, lifestyle and social media around it. They like the interaction and acknowledgment of peers.
What does parkour offer kids to get out of their homes and interact with a city and community?
Kids get to know and gain a deeper appreciation of the place they live, can get excited by the city and go off the beaten track. The people involved with parkour are environmentally and socially conscious and community driven, supporting a healthy lifestyle, eating well, donating your time, sharing knowledge, a partnership with other people, and improving the environment.

Are there differences that boys and girls want from parkour?
There are not enough girls who practice. I believe this is reinforced by images in the media. They are adolescent male dominant, sometimes using references to the Ninja warrior, which forms our perception. Media tells girls it’s more important to look beautiful than to be strong. Longer communities with older leaderships are more gender friendly; younger communities struggle with it.

What could designers be doing to be advocates for this movement?
Design spaces and details integrating play visions to make parkour possible on any outdoor site, for example, with the furniture. Study spaces with a big following. Why kids like and engage in these spaces. What makes them playful? Are they multi-tiered? Do diverse people train in walls, curves, railings, and in nature? Add ornamentation that kids could climb on. There are cheap ways to create interaction with the environment differently. For example, temporary installations, public art and using vacant lots.

Body Movements for Physical Play
- Use traveling movements such as walking, running, jumping, sliding, shuffling and rolling
- Move in different directions such as forward, sideways or backward
- Move in place, bending, pushing, stretching and twisting
- Explore moving at different levels such as from low to high, or create shapes with the body
- Explore balance and control when stopping or keeping the body still to hold a pose
- Move and climb through an obstacle course (jump, hop, run, crawl, sidestep, slide, walk and balance)

Design Prompts: Physical Play
- Actions speak louder than words. What types of physical movements does your design promote?
- Can you provide a range of physical gestures, from large to small, within your design?
- How does your design support a child’s natural drive to move freely?
- How does your design support a child’s physically healthy lifestyle?
- What are the cognitive and emotional benefits of your project’s physical play?
- Can physical play be combined and contrasted with calmer activities to enhance both experiences?
- Can you sneak physical activity into a design for the static user?
- Can music, dance and movement enhance your play experience?
Interview with Jay Beckwith (play systems designer), expert in residence at Gymboree Play and Music

Jay has been designing play systems for over 50 years. He has seen the many changes in childhood and the industry over that time period. He also has worked on his own theory around natural play patterns, which I find to be particularly helpful when brainstorming a diversity of ways to move the body in play and developing play activities.

What are the most important things designers need to be focusing on related to play in the coming years?

1. Let’s think about designs that reconnect kids to nature. Today most children live in cities and are less and less connected to nature. They don’t get the beauty of nature or have an understanding of its importance.

2. Genuine play rises from biology. Children are triggered to play by specific environmental cues. When you get the play experience right in your design, you know it because it appears right in front of you, naturally.

3. Embed challenges. Kids are fearless, parents are fearful. Kids often play up to the point of pain. I intentionally design for small failures, what I call self-correcting errors, as this has been shown in many studies to maximize learning with little downside.

4. Inclusion: Design play settings for everyone. Include people of different abilities, ages, and from different cultures. Why are “adult” play apparatus just outdoor gym equipment? Play isn’t just the domain of kids. It is for all of us. Currently, it is isolated and protected. We need to weave it into life.

Can you develop design challenges that you want designers to work on developing?

• The modern playground has become a play ghetto. They are built to get kids out of their homes and outside rather than to play in their neighborhood as a member of a community. As designers, how do we de-ghettoize play by including it in the fabric of our cities?

• The adventure playground doesn’t need to be junk. How do we provide for loose parts in a public setting?

• How do we engage and inspire the community? Offer them control such as playgrounds built by the people, mainly artists, in the community.

• Think about the players and the rules or freedom of engagement. It is not just the environment. Remember, a chessboard is black and white squares until you put the players on it.

Natural play patterns developed by Jay Beckwith

Play behaviors in children arise out of fundamental biological drives and are triggered by specific elements in the environment, which, in turn, elicit predictable play behaviors in all children. For example, a tree with specific shapes will elicit climbing, a railroad track will be an opportunity to practice balance, a mud puddle is sure to be jumped in. Three characteristics identify natural play patterns:

• The play pattern begins at birth and always by 12 months

• Play patterns have clear developmental sequence

• The physical manifestation of the pattern is reflected in the areas of the brain that are being developed through the exercise of the pattern

Face: Eye contact, bond, expression, babble, words, communicate, language

Hide: Object constancy, sense of self, pretend, intimacy

Accelerate: Slide, spin, jump, eye tracking, proprioception

Walk: Roll over, crawl, cruise, toddle, balance, run, dance

Climb: Brachiate, lateralize, motor planning, spatial awareness, height

Contest: Rough and tumble, strength to weight, games, sports, fitness

Jump: Bounce, jump, fly, land

Grasp: Touch, thumb, hand, gather, collect, pattern recognition, data, science

Combine: Associate, join, make, transform, engineering

Rhythm: Listen, babble, beat, syncopate, sing, harmony

Object Play

Have you ever heard someone say: “My favorite thing to do when I was a kid was banging on the pots and pans in the kitchen”? Object play includes playing with
things: toys, sticks, rocks, art materials and all types of loose parts. Constructive play (making new objects or constructing ideas) is a type of object play. They are all examples of handling physical things in ways that promote curiosity.

Did you learn to count on your fingers before you could do it in your head? Hands-on playing with physical things helps with learning manipulative physical skills and social and emotional skills, and is also a driver for cognitive development. This influences body memory and wires kids’ brains. In fact, young children learn best when manipulating objects. By freely experimenting with diverse objects, children gain information about the world and their place in it.

Inquiry is a way of questioning the world. We seek to learn something we don’t yet know, looking for answers to our questions. As young children sort and arrange materials, questions arise naturally. They wonder: What will happen if I put this here? How tall will it go? What color can I make if I mix blue and yellow? What will happen if I pour water from this bucket into a funnel?

Objects, or more specifically toys, created for play are designed to promote inquiry. Leave room open in the design of the object or prompts for the unexpected interpretation by the child. The object is a means to the end, the experiential results (play) that the object (tool) produces. Think about what kind of experience you want to create, not what kind of tool you want to make. Design that experience and then tool(s) will support it.

Benefits of Object Play

Physical

- Manipulation of small objects gives children the chance to practice fine motor skills.
- Playing with larger objects or ones that promote movement enhances gross motor skills.
- Playing with balls and other objects in sports enhances skill and fitness.
Cognitive

- They gain knowledge through experimentation: They learn about the nature of objects and generalize about broad categories of similar objects.
- Creativity: Activities such as building towers and sculpting clay help develop strategies to tackle problems successfully. Objects become symbols for the imagined.
- Convergent and divergent problem-solving: Children come up with new ideas and recombine them to create novel scenarios.
- STEM–STEAM–STEAM-D: Through play blocks, puzzles, sand, balls, crayons and paper, children begin to understand logical scientific thinking, such as the concept of cause and effect. They practice experimentation, observation, measurement, quantification, classification, counting, ordering and part–whole relations.

Social and Emotional

- Through objects, children can create and express themselves.
- Social object play with adults and peers benefits children’s learning to negotiate and interact with others.
- By playing with objects such as dolls or teddy bears, children can mimic or explore a range of emotions, nurturing and empathy.

Theory of Loose Parts

This theory was first proposed in the 1970s by architect Simon Nicholson, who believed that it is the loose parts in our environment that inspire creativity. Loose parts are materials that can be moved, carried, combined, redesigned, lined up, and taken apart and put back together in multiple ways. They are materials

► Figure 6.7

Milk crates are objects for constructive play and storytelling in a Danish playground.
Source: author photo.
with no specific set of directions that can be used alone or combined with other materials. Loose parts can be natural or synthetic. Stones, stumps, sand, gravel, fabric, twigs, wood, pallets, balls, buckets, baskets, crates, boxes, logs, rope, shells and seedpods are all examples of loose parts. Today there is a strong movement to integrate loose parts in designed objects and spaces.

**Loose Parts**

- encourage open-ended learning
- can be used in any way children choose
- can be adapted and manipulated or used in many different ways
- encourage creativity and imagination
- develop more skill and competence than most prescribed toys

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**Timeline for Object Play**

- Exploratory play is the first form of object play and typically begins around 5 months of age. At first, they explore the world orally. At 5–6 months, they explore objects with their hands and eyes together by looking at them, passing them from hand to hand to learn more about them. This is unique to humans.
- By the second year, children begin to combine objects in play and start to treat objects according to their intended function.
- Later within the second year, children begin to treat objects symbolically; for example, a block may represent a piece of cake.
- Over the following few years, children use objects in pretend play and the creation of increasingly complex and representationally realistic structures in construction play.
- They also use art materials to create symbolic representations of their thoughts and the world around them.

Many objects within the same category – puzzles, games, blocks, dolls – build in complexity as a child grows.

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**Figure 6.8**

Soft loose parts where children create their own games to engage in pretend, social and physical play.
Source: Maryam Aziz (used with permission).
Manipulatives

Manipulatives are physical objects that engage a child visually and physically in learning concepts, such as coins, blocks and puzzles. The use of manipulatives is constructivist, because students are actively engaged in discovery during the learning process. Children who gain confidence manipulating objects become good at creating ideas and working with numbers and concepts.

Interview with Jed Berk/Itsabob

Jed Berk merges the fields of art and design with his balloon creations.

Can you explain how the goals of this project evolved from some of your previous work?
I was showing my work in galleries and museums around the world, and I noticed that balloons bring a sense of wonder and joy to everyone. I wanted to find a way to bring my work into people's homes and everyday lives. The feeling of letting a balloon go inspired the play experience for this product.

What research methods did you use in creating the design?
You squeeze the Itsabob to bring the balloon down, and when you let go, the balloon floats up again. I worked on many design iterations and prototypes to capture the interaction in a straightforward squeeze gesture. I developed several mechanisms and playtested many times to get the feeling right.

What were some challenges you had when you began manufacturing?
Stripping out the complexity has been the focus of bringing this product to market. Even with intense prototyping, I spent many months working with the manufacturer to recreate my development in the prototype through their manufacturing processes.

How do you market the product?
Marketing is challenging because the product needs to be demoed, and that is difficult. Once it is seen, it sells itself. I have sold it at events and fairs, and that has been positive. Another challenge is that the product doesn’t merely fit into a given market. It is part whimsical toy, part art object, which transforms balloon play. So I have to be creative with ways for people to understand and experience it.

You obtained a patent on this design. Can you explain why?
I wanted to ensure that I wasn’t infringing on others and to then secure and protect my IP. The patent for Itsabob can be found on uspto.gov.

Did you have surprises in how kids used or experienced it once it was on the market?
When creating it, I always saw one or two working at a time. When 30 kids at a birthday party have them, and it is a group activity, it is an incredible experience. I love seeing expressions on people's faces at that a-ha moment when they let go.

▲ Figure 6.9
The string extends by squeezing the toy and the balloon floats away. It is reeled in by squeezing again.
Source: Jed Berk (used with permission).
Design Prompt: Object Play

- How do we provide children with the tools they need for freedom?
- Can objects become a springboard to create deeper human interactions?
- How do we create play from objects that are easily accessible?
- Gather together loose parts and create three very different open-play scenarios.
- How can interactions support the concepts you would like to act out physically through manipulatives?

Constructive Play

In addition to language, a significant point of difference between humans and other mammals is the complexity and diversity of the things we make. As a species, where we lack in physical capabilities such as strength and speed, we have filled the gap and created devices to help us. Even though today most of us don’t build our own homes or make our tools, transportation and communication devices, we still practice for these skills as children with blocks, sand, water, tools and chalk on the sidewalk. Constructive play can be intellectual as well as manual. Children can construct stories, songs and secret codes.

Constructive play allows children to experiment with objects and test hypotheses. They build their “what if” skills. They find out combinations that work and don’t work and learn basic knowledge about stacking, building, drawing and constructing. In the cases, they make something that they see in real life in their culture and recreate it. For example, in hunter-gatherer societies, children make small versions of their huts, bows and arrows, and baskets in their play to practice the skills they will need to make real ones later on. In our society, they may make a spaceship from their favorite movies, possibly leading to a career in transportation design or at NASA.

Benefits of Constructive Play

Physical

- Strengthens gross and fine motor skills to manipulate and control the objects or materials

Cognitive

- Enhances creativity and problem-solving skills
- Strengthens the ability to plan the use of materials to see a design idea become a reality
- Allows children to test ideas and expand divergent thinking
- Builds a foundation for abstract thinking
CHAPTER 6 Play

Social and Emotional

- Nurtures perseverance in the face of construction challenges
- Children learn teamwork and the ability to cooperate collaboratively and complete a task together
- Gives children a sense of accomplishment and control of their environment
- Builds confidence in accomplishment – I made that!
- Recreating scenes from their life, such as visiting the park, helps them reflect on their world
- Allows for failure
- Creativity allows children to express themselves openly and without judgment. The ability to be creative, to create something from personal feelings and experiences, can reflect and nurture children’s emotional health

Timeline for Constructive Play

Constructive play starts in infancy and becomes more complex as a child grows. For young children, it involves open-ended exploration, gradually becoming more functional, then evolving into conceptual transformations.

- Babies put things in their mouth to see how they feel and taste.
• Toddlers learn what various objects can do. They build things with toys and materials.
• In the preschool years, constructive play merges with exploration and make-believe play and builds conceptual understanding.
• Has social imaginary situations, specific roles and implicit rules, and is recognizable by its persistence and tendency to become more elaborate over time.
• Grade school-aged children may turn to a potter’s wheel, complex models, 3D puzzles, woodworking projects, knitting and small detailed construction toys.
• Older children will construct real objects, such as sewing their clothing or building their own skateboard.

Designing for Invention and Creativity

Interview with Cas Holman, founder of Heroes Will Rise, a toy company that encourages exploratory, unstructured play.

How do multiple play patterns in your toys work together to enhance different types of learning?
By letting children direct their play, the materials require imagination differently than if they had instructions. There is a value in practicing following instructions, but there is a much greater value in imagining and inventing something on your own – then figuring out how to make it. The figuring out is critical, and it’s also the play. To try something, fail, undo it, redo it, test it, discover something you didn’t expect, take it apart, learn from all of that, try again … Often there is no goal in what they are making, so there is no doing it wrong – just challenging, playful experimentation.

How does the scale of your product impact the play value? The materials you choose?
It’s inspiring for children to make something bigger than themselves – to create and/or affect their environment, make it their own. There tend to be a few stages of play – first they build a thing – then they play in/on/around the thing they built. It’s uncanny how often I hear kids say “It’s real!” when they approach Rigamajig. For children to feel trusted to use large, heavy materials is very empowering. That’s us, adults, telling them: “You can make this, we trust you.”

▲ Figure 6.11
The scale of the blue blocks makes Imagination Playground a collaborative experience.
Source: Cas Holman and KaBOOM! (used with permission).
Can you explain your involvement with Anji Play?

My role is to help Anji Play to standardize and “productify” these over 150 individual parts. I set to work standardizing the dimensions and figuring out which of the three types of wood used would be best. In talking to Ms. Cheng about her experience with each, she explained why having one size ladder in three different types of wood is important – this is how the child learns about materiality. The bamboo ladder is lighter, the rungs and rails are one entire stalk of bamboo. It’s hollow so sounds different when you drop it. Pine, by comparison, is heavy, the rungs and rails are square, and has wood grain. The sound it makes is more of a thud than a drum; solid versus hollow. The ladders are very long, so children learn how to ask for help from peers and cooperate in moving and setting them up. How could I assume the function of a ladder was to climb?

What are some key learnings from Imagination Playground and Rigamajig about making a product kit of loose parts?

Storage is critical; and design them to be easy to put away, ideally by the children. In Anji Play, children move seamlessly from playing into clean-up. An observer could easily not notice they are cleaning up, save the music that signals clean-up time. There is a lot of sorting, organizing, stacking, cooperating that happens in putting loose parts away, and kids love all those things. Anji is proof that there is value in children contributing to their community. They want the materials to be put away correctly.24

Pretend (Imaginative Play)

Pretending involves creating alternative realities to the real world and building on the capacities of the imagination. They think about things that are not immediately present, much as we do in the brainstorming process or as scientists do when developing theories. Children enact different people, places, times or scenarios from their imagination by establishing propositions about the nature of their pretend world, and then act them out logically. Children learn to abstract, to try out new roles and events, and to experiment with language and emotions, enact various situations and think flexibly. In an ever-more technological society, practice with all forms of abstraction – time, place, symbols, words and ideas – is essential. Play futurist Yesim Kunter suggests considering the playability quotient in designing play tools (toys):

They need to fit easily to the child’s imaginative storytelling, first his inner speech second his social speech. If it doesn’t live in the imagination, then it will result in two seconds fun, and it is not well designed. It needs to have this magic spark that can evolve as the child plays!25
Through pretend play, children can examine and understand various types of interpersonal interactions and social situations. Source: author photo.

Symbolic Play and Socio-dramatic Play

Symbolic play mentally transforms objects to represent pretend entities – for example, a child pretending a banana is a telephone.26

Socio-dramatic play is the social version of pretend play, where children within a social group pretend and cooperate to take on different roles, for example, “let’s play superheroes.” Then one child becomes Batman, another Wonder Woman and one Spiderman. As they enact roles, they are exercising their ability to behave in accordance with the shared understanding of what is or is not appropriate and practice negotiation and self-control. Kids learn very quickly that if we work to get along with people and keep our friends happy, we too will be happier and the play will last longer.

Benefits of Pretend Play for Children

Physical

- Learning by doing. Physical expression and learning through the physical gestures and body.
Cognitive

- Linked to divergent thinking, creativity, and flexible and creative problem-solving.
- Exercising decision-making as the play progresses.
- Pretending contributes to children's understanding of language and literacy symbols and their meanings. They learn to build and remember narratives. Children practice language usage in pretend play more than other forms of play.

Social and Emotional

- Navigating interpersonal reactions: Negotiating and cooperation with others and jointly engaging in the rules of engagement.
- Socialization: Children can experiment with skills and a variety of roles and learn about realities and expectations.
- Social understanding: They gain better understanding of themselves and others, and that other people have intentions and desires that are different.
- Coping and emotion regulation: Fantasy gives children skills to regulate their thoughts, feelings and behaviors.
- Offers children an opportunity to achieve mastery of their environment and control the experience through their imagination.
- Helps develop each child's unique perspective and individual style of creative expression.

Timeline for Pretend Play

(0–2 years) Babies and toddlers will use what they remember in pretend play. In their second year, children begin to engage in symbolic play. A teddy bear will represent a baby, and blocks will become a tower. At around 18 months, children begin to transform and animate objects such as a stuffed animal in their environment by giving them life. Shortly after, they give objects different functions – for example, pretending a box is a house.

(2–3 years) More imaginative fantasy gradually emerges in the pretend in two-year-olds. They sometimes lose sight of the line between fantasy and reality – even in their own pretending. They can understand pretend actions by others and respond appropriately within the pretend context. For example, an adult or another child can pretend a lump of mud is a cake, and the child may pretend to eat it.

From toddlerhood to preschool age, the pretend becomes increasingly decontextualized, play can occur with or without objects, and children can create imaginary characters and situations.

(3–4 years) Preschoolers relate to their real-life experiences. In peer play, one child often assigns roles to the others, who may or may not make the play their own. Imaginary friends often appear around the age of 3 – and can
play a significant role in a child's play. They have reached the peak time for pretend play, more realistic and detailed.

(5–6 years) They have a stronger grasp of the difference between real and pretend. Their increased attention spans and awareness of detail enable them to stick with and extend play themes for long periods of time. Pretending is social, and interacting together is fun.

(6–11 years) In the early years of elementary school, children continue to pretend. It is used in academic programs to teach literacy and other school subjects and nurtures a child's abilities in creative writing.

(12+ years) In middle school, pretend play wanes as they become more interested in organized games; however, they still engage in private fantasies or pretending in the context of digital media.

Design Prompts: Pretend Play

• Pretend a single object represents five completely different real-life things. Then build a story around it that integrates all five objects.

• Build three sock puppets and give each a name, a personality and diverse interests. Build a story that includes them each interacting with one another in a play scenario.

• Give a pretend function to a real object. Give a pretend object a real function.

• Play with an imaginary friend. Act out various emotional situations.

• Put together a costume box of scarves, purses, hats and clothes, and dress up as different characters.

*Storytelling (Narrative Play)*

Storytelling play is the play of learning and language, starting out with a parent telling a story or reading aloud to a child, and leading to a child retelling the story in their own words. Storytelling play often merges with pretend play. For example, a child may start recreating a scene from a book that they read and use the existing story as a springboard for a new one. Or they might start out with a story from their life and then retell it with elaborate fantasy details. It is an expressive form of play.

Stories help kids understand themselves, others, family history, morals and the human condition. Through stories, children see and hear the building of plots, characterization, climax, conflict and conclusion, and learn to organize experience structurally and communicate with others.

Timeline for Storytelling

• (2.5 years old) A child may begin to retell essential stories about themselves that they have heard.

• (3–4 years old) They can tell many kinds of stories: autobiography, fiction and reports they have overheard. They can tell stories with other people, and to other people.
(5–11 years old) They spend a lot of time learning through stories and creating their own stories.

(12+) Adolescents are formal and conversational about the stories they tell and enjoy critiques and debate.

Benefits of Storytelling Play

Physical

• Acting out a story through body language and facial gestures helps kids learn about non-verbal communication.

Cognitive

• Through listening to compelling and fascinating speech, children build language skills and vocabulary and learn how to make a story interesting, exciting or sad.
• When children recreate stories, they have to remember key points of the plot and character names. They build memories best through stories.
• Storytelling opens children’s minds to new worlds, other cultures and life philosophies. Storytelling is also a way to bring history alive and inspire further exploration of historical events.
• Children tap into their imaginative minds and provide their versions of the story.
Social and Emotional

• Stories often show us about the human condition and that we are all the same.
• Sometimes it is easier to communicate serious topics than in serious conversations.

Design Prompts: Storytelling Play

• Pick a topic for a child’s social and emotional development and think of an existing story that addresses that topic. Build on it.
• Choose an existing folk tale and recreate the storyline with new characters in a contemporary environment.
• Recite a historical story in two different ways just by changing your voice and expressions. First make it dramatic, then make it funny.
• Creating a diorama or building a 3D model allows a user to interact with a story and the characters.
• Put on a costume of a known character and act out building on their identity.

Creative Play

Think about the creative potential a cardboard box holds for a kid. It could be a spaceship, a robot, a house or a car, depending on the day, mood or interests. Creative play is when one expands on what is known in the current state, to create something new. Creativity allows children to express their uniqueness openly and without judgment. The ability to be creative, to create something from personal feelings and experiences, can reflect and nurture children’s emotional growth, providing opportunities for trying out new ideas, and new ways of thinking and problem-solving.

The experiences children have during their first years of life can significantly enhance or squash the development of their creativity. Any creative act can help children express and cope with their feelings and can help others to learn more about what the child may be thinking or feeling.

Creative play allows a child to develop divergent thinking: the ability to see things not for what they are but for what they could be. What is taking place in their head is that the brain scanned the objects around them, assessed their physical and aesthetic properties, and mapped those features onto alternative symbolic identities. Developing divergent thinking skills and imagination through pretend play, constructive play or creative play influences creativity as an adult.

If creativity is not a defined genetic trait but a skill and process practiced over time, then what can we do now to inspire and foster creative development from a young age? As children spend more and more time taking standardized tests and engaging in highly structured play (organized sports, video games, etc.), open-ended and imaginative play is being marginalized. Many designers and educators believe it is our responsibility to promote creative play to inspire children and build the “what if” skills that will be critical to their creative success.
If this magical age of creativity found between the ages of 3 and 5 is to be maintained and developed rather than stifled, then great care is needed to develop its evolving process.27

Benefits of Creative Play

Social and emotional

• Helps develop each child’s unique perspective and individual style of creative expression.
• Expresses the child’s personal, unique responses to the environment.

Cognitive

• Allows a child to develop the critical cognitive skill known as divergent thinking.
• Offers children an opportunity to achieve mastery of their environment. They control the experience through their imagination, and they exercise their powers of choice and decision-making as the play progresses.

Games with Rules

People need to abide by norms, laws, and social agreements made between themselves and others to have peaceful communities. Social skills are practiced in formal games. In other forms of play, there are rules, but they are usually implicit; they are understood but usually not explicitly stated. In formal games, the rules are explicit. In competitive games, the rules are stated to be fair, and there are often winners and losers. There are also cooperative games with rules, such as jump rope. Games with rules are often characterized by logic and order, and as children grow older, they can begin to develop strategy and planning in their game playing. Board games, digital games, apps, party games, card games and sports can only function because everyone is adhering to the same set of rules.

Students addressed the day-to-day challenges and aspirations of at-risk teenagers and set out to design an art park to foster safe, artistic expression.

Source: design by Anycia Lee, Evian Olivares; photo by John Dlugolecki (used with permission).
Often children create their own games with rules, either by modifying an existing game or by creating a new one. As children develop the concept of their game, they need to negotiate with each other to make the game enjoyable for all players with various skill levels. Adapting the rules to make the play fair for everyone makes the game more fun and extends the play time.

### Requirements of a Game

- Games require a definite beginning and end.
- Rules are the essence of the game and must be honored to engage successfully.
- Social games require players to take turns and follow specific procedures to complete the game.

### Benefits of Games with Rules

**Physical**

- Active games with movement help develop fitness and gross motor skills.
- Dexterity games help practice with manual dexterity.

**Cognitive**

- Games for small children often have educational benefits: number, color, shape, letter recognition, grouping, counting, reading, visual perception and eye–hand coordination.
- Board games such as chess and checkers strengthen logical thinking, problem-solving, rationalization and strategy abilities, since they must consider both offensive and defensive moves at the same time to succeed.
- Memory, math, planning and deductive reasoning skills are exercised when playing many board games.
Social and Emotional

- Teaches children an important concept: The game of life has rules (laws) that we all must follow to function productively.
- Social games enhance social skills and strengthen self-regulation, and kids learn to be winners and losers.
- Team sports require and teach cooperative play, competition and teamwork.
- Games expose children to real-life situations, stories and narratives that expand their knowledge of the world.

Timeline for Games with Rules

Developmentally, most children progress from an egocentric view of the world to an understanding of the importance of social contracts and rules.

Preschool children participate in simple games with rules such as follow the leader, tag, musical chairs, matching games, and board games with spinners. Digital games are continually being developed to reach a younger and younger audience, including toddlers.

Games, both physical and digital, allow children to imagine in a fantasy world as they play through the game.

Before the age of 6 or 7, competing and reaching a goal, strategy and logic aren’t important to many kids, because they don’t understand what it takes to win. As kids get older, the competition, challenge, feedback, winning and losing, and the social aspect of board games become more essential.

Board Games

The in-person social component to games is a welcome reprise from interacting with or through a digital device. We are seeing not only an increase in board game playing but also a diversity of games kids are playing.

Board games include games of chance (outcome is strongly influenced by a randomizing device (cards, dice) and games of skill (determined by the mental or physical skill of the players). They often combine both chance and skill. They may be themed with a clear narrative, such as Monopoly, or have no theme, like checkers. Many board games also have digital versions that reinterpret or extend the gameplay and storytelling.

I have experienced that developing a novel, useful and non-obvious game interaction and mechanic that could be patented is important in the game industry. Including novelty features that enhance the interaction between the game and among players and visual development of the board game enhance gameplay as well as branding the game.

Genres of Board Games

- Strategy games
- Cooperative games
- Party games
Design Prompts: Games

• Can your game appeal to different age groups, personalities or interests? If so, how?
• How does the style of the artwork contribute to the game experience?
• Do your users care a lot, or are they indifferent to the rules, winning or losing the game? How might this change the game strategy for different users?
• Can you develop a unique interaction among players?
• How will you playtest your game throughout the process?
• What types of social dynamics might there be in the group of players?
• How do these areas—strategy, socialization and physical skills—translate for your audience throughout the game?

Interview with Robert Cron, co-owner of GameHaus, a board game café in Glendale, California, with over 1,400 board games

How do you see the GameHaus fulfilling the role of a third space and provide a sense of community?
We’re all here to “nerd out” over the same thing, in varying degrees. The fact that you’re having fun is tantamount to the experience we provide. Enjoying a game like Diplomacy doesn’t override fun playing a game of Chutes & Ladders.

How did you decide on which games to include in your library?
We have a good variety to appeal to a broad range of tastes—some people only want to play familiar family favorites or old standbys, so there’s Battleship, Clue, Stratego, Mastermind, and all those titles that have been around for years. The downtime of learning rules is minimal. But we also try to appeal to the more experienced and hobby gamers, so we have games like Settlers of Catan, Ticket to Ride and Pandemic on the shelves. We even have a small section of old hex and tile wargames (because in a sense we’re completionists), though they rarely get played. You wouldn’t go into a major bookstore and only find romance novels, or horror novels, or biographies.

Do different types of games appeal to different age groups, personalities or interests? Why?
For diehard gamers, in particular, this is an extremely focused hobby. Websites and YouTube channels are dedicated to the newest and latest games coming out, forums are filled with back-and-forth discussion of whether or not the area-control mechanic of this game is utilized to the fullest, or if the components and map artwork does justice to the gameplay, or whether or not the theme is “pasted on” and not relevant to the experience. To some people, an experience like what we provide might be a novelty. To many of the more hardcore hobbyists, it’s an entertainment focus, so it’s something in which they invest a lot of time and effort and money and focus. It’s serious and something they enjoy immensely.28
Digital Play

Computer games can be a valuable tool in playful learning. Digital gaming has also been accused of inhibiting the development of social skills, increasing rates of obesity and promoting violent behavior. In a lecture I attended at the Play Conference, Dr. Stuart Brown shared an insightful comment. In his opinion, “It is not about if digital games are good for you or not – if the state of play in a digital game is beneficial then it is good, if the state is about addiction then it is not so good.” It comes down to the content that the kids are consuming, the amount of time they are spending with digital devices and the state that it brings them to.

As designers, we are looking for ways to integrate the benefits of what the physical and digital worlds have to offer. The boundaries are increasingly blurring to phygital, and concepts merging the two will be increasingly developed in the next decade. We see that Gen Z seamlessly integrated technology into their lives, and Gen Alpha already don’t differentiate between the digital and physical realms. Virtual reality (VR), augmented reality (AR) and mixed reality (MR) are just reality. Developers of digital products are looking for ways to enter the physical world, while developers of physical products are looking for ways to integrate digital products and experiences.

Kids and youth today have the tools and knowledge to create their own content. Coding is becoming a skill that tech toys and many schools are providing at an early age. As the graphics increase in sophistication, content created by children may look very similar to that created by professionals. This, in addition to the advances in 3D printing devices and materials and the simplicity of the software, means that younger and younger children who are interested will be completely capable of designing and making their own games and toys. Tom Mott, interactive producer and learning designer, explains:

One thing I find fascinating is that digital play experiences can engage kids in a fantastic way. Kids spend hours figuring things out
on their own; not getting frustrated when something goes wrong; learning complicated things and then remembering them later. These are fantastic executive function skills. But what’s interesting is that the data is mixed on whether there’s a crossover effect outside of the game.30

For genres on digital games, see p. 429. For gamification in everyday life, see p. 431 in Chapter 9.

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Benefits of Digital Play

Cognitive

- Games promote playful education, especially for older kids, when other forms of play have diminished.
- Games challenge kids to make decisions through graduated levels of complexity and advanced knowledge and skills.
- Games motivate children to play, teach them to stick to tasks longer, and increase visual-spatial abilities, memory, critical thinking, problem-solving, executive function, qualitative thinking, exploration, experimentation and creativity.
- The multiple modalities (visual, tactile, auditory) can serve the needs of different types of learners.

Figure 6.18

In this digital interactive immersive aquarium environment, kids can draw their own fish and add it to the digital display.
Source: author photo.
• When applied to educational content, it has the ability to increase the retention of the material. Content that promotes call-and-response interaction promotes more learning and engagement than static consumption.

Social and emotional

• While electronic play and gaming can be used for a solitary activity, it can also increase group social play and community and develop social skills.
• Cooperation and teamwork are needed for multiplayer games.

Physical

• Practice with hand–eye coordination, spatial skills and fine motor skills

Design Prompts: Digital Play

What part of your project is best experienced in the physical world? The digital world?
What should the players interact with on screen, on the device, in the real-world environment?
Will the devices talk to each other, kids and real-world objects? What will they say?
What mental models do users in your audience currently have?

Technology and Play

Interview with Dan Winger, senior innovation designer, LEGO group
Industrial designer Dan Winger develops new experiences that bridge physical and digital play.

Which technologies do you see as having the most promise in the future of play?
In the past several years, we’ve experienced a technological revolution like no other in history. There have been major advances in the areas of computer vision, artificial intelligence, machine learning, big data, blockchain, 3D printing, connected devices, virtual reality, augmented reality and mixed reality. These will soon be disrupting the entertainment industry (along with many other industries as well) and enable all types of new experiences. I’m most excited about mixed reality because it can layer playful entertainment and elements of gamification within our interactions with the real world. Many technologies are driving us deeper into digital experiences, but MR has the power to drive us to back to physical play and interactions.

Can you list three advantages that digital play can offer in the activity of play that the physical world cannot?
Some play experiences are better in the physical world and some better in the digital, but in many cases, the two working together can enhance both. The list of advantages for both sides can be quite long, but here are a few examples.

a. Ease and access to creative material. For example, when building in Minecraft or LEGO Worlds, you have an infinite supply of bricks to create with, you won’t have to sift through your entire collection looking for that element, and there’s no mess to clean up when you’re finished.

b. Competing, sharing and social interaction on a global scale. Many digital experiences allow you to play with your friends remotely, meet new like-minded friends, and collaborate or compete with others around the globe. Also, there are many online creative communities – sharing galleries of user-generated content.
Mark Hatch, the author of *The Maker Movement Manifesto*, says, “You cannot make and not share.” The ability to share your work can be one of the most influential motivators to create. Creatives motivate each other, teach and learn, share ideas and projects, and make friends with others that share similar passions for creating.

c. Greater levels of wish fulfillment and escapism. In video games, you may have superpowers to save the world, compete to be the strongest warrior, explore fantasy environments and alien planets, tend to a farm, collect and train exotic pets, or many other fantastic experiences.

How do you envision the seamlessness from physical to digital play evolving?

Many existing experiences merging physical and digital play – such as the Toys to Life category – often involve a physical toy or creation being unlocked within a digital game. A shallow physical experience (or even just a physical product) leads to a rich digital game, in which the material and digital experiences never truly happen at the same time. Shortly, with technologies such as the Internet of Things, computer vision or mixed reality, you can have all the rich digital content occurring as you play with your physical toys.

How do you decide what should remain a tactile experience versus a digital one?

My work has been focused on creating new hands-on play experiences. This is often achieved by leveraging digital technologies to adapt to today’s evolving play patterns. So whether it’s weighted towards the digital or physical, the distinction can be quite clear by asking a few questions.

- Does the digital experience extend, enhance and create more engagement with the physical product?
- Does the digital content inspire more hands-on creative building and play?
- Does it enable new types of play that could not be achieved otherwise?

If the digital features and experiences address these and similar questions, then it adds value to the physical experience.

How can technology help kids with these different types of play?

Constructive Play

Technology can open up new ways of playing with your creations and strengthen emotional engagement. Minecraft gave kids their own entire world to build, customize, interact with and explore with friends – something that could only be achieved digitally. Similarly, products allow users to build and share their own games, and leveraging computer vision technologies, you can even bring your physical constructions into your digital experiences.

Active Play

Over the last several years there has been a lot of development in this area, mainly leveraging technology to gamify fitness and active play. Data tracking of your runs and bike rides opens up asynchronous competition with other members of the community. Athletes can compete with others in real time without leaving the house in a simulated video game experience. The hugely successful craze of PokemonGo simply got users walking around their city to catch fantasy monsters in an augmented-reality, geolocation game. Many of these services have targeted older early adopters, but we’re beginning to see these experiences being aged down for kids as the technologies become more accessible.

Pretend Play

Many video games, such as World of Warcraft, offer an immersive escape into a fantasy life and world, but it is one of the more challenging play types to integrate physical and digital play together. It’s difficult to balance and align the digital content with the stories and fantasies happening within a child’s own mind. I believe core value is that digital content can remove the ‘blank canvas,’ and provide kids with inspirational triggers to spark their imagination. This can be in the form of missions or story starters to get them acting out a variety of scenarios. This area will become incredibly exciting when near-eye mixed reality devices become mainstream as fantasy content, features and stories can be overlayed on your physical toys. Also, voice-activated AI platforms could even trigger creative storytelling and role-play through audio content alone.

Toys

Toys guide play in many different ways. A simple square of fabric used as a cape will guide play differently than a Batman cape. The toy designer’s role is to keep the experience as the central focus and design the tools as a catalyst for children to use, construct worlds, hypothesize and imagine. In my conversation with Dan
Winger, senior innovation designer at the LEGO group, he recommended for designers to consider:

The product is a tool for the experience. Think beyond the toy and physical features and focus the playful experience it can enable. What stories will they begin to role-play? How can they play with friends? What triggers their interest to engage each day, etc.?

In aboriginal cultures, they make toys from found materials and replicate their lives in play. In consumer societies, toys are purchased. Handmade and the craft of toys exist all over the world. Exceptions I have found are in “toy deserts,” where underserved communities have little access, and households that withhold toys as a statement against consumerism and a means to give their children natural development.

Toys Research

In our research, toy designers are most interested in learning how children play. How children play can reveal a lot about who they are and how they see the world. How does the toy enhance or create an experience that further develops a child? What are the individual benefits? The social benefits?

- Through observational research, we try to uncover what children do when they play. What are the prompts that will bring about an engaging play experience?
- When creating new designs, study analogous experiences through classic toys that are out there to understand the overall patterns of behavior.
- In playtesting with multiple children in different age groups with different personalities and interests, we can map out how different children respond.
Use scenarios to think through possible play experiences. We can never really foresee all the ways a child will use a toy, but we can embed features that open up opportunities for the imagination.

We look at education through psychology studies on play to get to the root value of the play experience we are creating.

Talk to psychologists and educators who continually observe and evaluate many different children and can offer insights from a professional perspective.

Review the Toy Industry of America trend reports every year to see how megatrends in culture are affecting the toy industry.

Suggestions for designing toys from play futurist Yesim Kunter:

- Understand the audience: Who is going to play with it? What is the age group it will be aimed at? What are the needs of this demography? Understand the audience's needs and motivations.
- What type of play does it provide: Is it provoking solitary play or social play? Object play (functions, mechanisms), social play (imaginary-role-play), active play (fine–gross motor), games (play with rules and objectives).
- Focus on the “fun” element of the design.
- How is all of this captured in the final design: fun, function, color, form, and subtly communicated to the customer within seconds.32

Toys and their Role in Learning

The framework for the TIMPANI (Toys that Inspire Mindful Play and Nurture Imagination) study can be helpful for designers to build assessment techniques that can be used in playtesting and design refinement. It can also be used to assess a toy once it is on the market to see whether it is working as intended. The study codes children's use of the toys to produce quality play in different areas, using a coding instrument that they have developed:

- Verbalization: Talking to others, singing
- Thinking/learning/problem-solving: Figuring things out, working through a problem
- Creativity: Unexpected ways to play with the toy. Transforming the toy
- Social interaction: Parallel, associative, cooperative

A few things they have learned from the study over the years:

- Basic is better
- Construction toys score very well in multiple categories – lacking gender, different socioeconomic backgrounds
- Children have different background knowledge. That creates different impacts on children33

Use this method as a framework to build your own assessment tool for play value.
Interview with Tom Mott, senior producer, and interactive learning designer

Tom Mott is a designer who works in many areas, including project management, user experience design, learning design, game design, gamification, research and writing. He creates learning products for companies such as LeapFrog. He has a background in Fine Art.

What are the most important things for toy and game designers to know about child development?

Physical: Kids need to move! Little kids don’t have exceptional motor skills yet.
Social/Emotional: Kids have different temperaments. A timed game can be fun for one kid and stressful for another kid.
Cognitive: You always need to think about appropriate cognitive load: At what age can they follow two-step or three-step directions instead of just one?
Play: Think about repetition: If your toy or game has something that people love, they’ll want to do it again and again.

How much do you consider children’s behavior throughout the experience in the design of a product?

I consider it constantly. When working on interactive products, I strive for a balance between free play and “guided play.”

What are the most important things for designers to know about the culture of childhood today?

For 2-6-year-olds: I think a lot of the old paradigms still apply. Parents don’t want just to stick their kids in front of screens. They want developmentally appropriate toys and games. If you do happen to be designing screen-based products (web or apps) for that age range, there will typically be an expectation that (a) you’re not advertising to the kids or continuously upselling them; and (b) there are educational benefits, whether they’re explicit or implied.

For kids 7 years old and up: once you get into this age range, you’re competing with school, after-school activities, sports, homework, and the aspirational culture of smartphones, tablets and video games. More and more of these kids want to be playing. If you’re a designer of learning games, you’re going to be designing for a niche market. If you’re a board game designer, you need to think about gameplay that’s appealing to an entire family. One big challenge is that your target audience (the kids) are now in school for 6 hours a day. They’re learning all day. The parents say “We don’t need to keep buying all the learning products.”

What types of projects do you find best experienced physically? digitally?

Developmentally, kids still need to play with things, just because your brain does different things when you’re manipulating and touching actual objects instead of just processing audio-visual information.

Digital: One thing digital provides, of course, is solo gameplay: you can play chess with a video game without anyone else. You can listen to audio stories even when there’s not an adult available to read to you. I think social-emotional skills are best offered through direct interaction with other people, not through an app. That may change of course.

Physical: Kids need to burn off energy. And, like it or not, sports ability is a primary way that elementary school kids establish social bonds and relationships, so it’s essential to get the kids out of the house and moving around, not just playing video games.

Do you have any suggestions on how to best merge physical and digital play?

Many of the products I’ve worked on do this. They were physical products (books, maps, board games) that also have digital content in the form of interactive audio: tap the page with the stylus and hear audio responses. A couple of insights … with the caveat that the suggestions would change depending on the target age and type of product you’re making.

1. When possible, the physical item should function even without the digital aspect. A talking stuffed animal should merely function the way a stuffed animal does typically.
2. I love when the digital play supports or suggests the physical play. The physical movement reinforces the audio/visual learning. When we designed the Animal Adventure Board Game, some of the activities we included involved getting kids to move around the room like an animal (flap your “wings” like an owl!) which kids love.
3. So far, the best merging I’ve seen takes an existing play pattern (building with blocks, controlling a remote-control car, electric trains) and instead of merely replicating it digitally, you provide something they couldn’t otherwise do. Building blocks that come to life. A remote-control car that lets you explore from the car’s point-of-view and film videos. The ability to place a 360-degree camera on top of an electric train and film immersive videos that you can watch later. That’s so cool!
As a game writer, what are some of the things that you consider in story and character development and how that relates to the play experience?

Most of my products have many mini-games or shorter interactive experiences built into a more extensive product. For example, with an interactive book, the book itself (say, *Cat in the Hat*) is telling the story, and then the games and interactive audio that I write are supporting reading comprehension, engagement with the text, or just providing an additional way to interact with the characters in the story.

Two ways I think about a story and character development:

1. Ideally, these types of mini-games should either relate to the story or the characters. Not just a random “Let’s play a guessing game!” or “Let’s race!” but extend what’s happening on the page. If the Cat in the Hat is making rhymes … let’s make rhymes with him. If Fish is getting angry at the Cat in the Hat, let’s explore why he’s getting angry.

2. Fun games often have some conflict and resolution. At a minimum, that just means helping a character on the page. (“Let’s help the Cat in the Hat clean up the mess!” is much more engaging than “Let’s find things on the page.”) (“Oh no! Let’s set the table before the guests come!” is stronger than “Find the words on the plates.”)

What does the future of play look like to you?

I think there will always be social and physical aspects of playing: go to the park and play with friends. Run around. Play hide-and-seek. Build a clubhouse out of cardboard boxes.

I think that for 2–6-year-olds, a lot of traditional things will stay the same: blowing bubbles, imaginary play, dolls, action figures, hide-and-seek, developmentally appropriate toys, physical board books and picture books. Older kids (7 and up) are dying to get onto screens, whether that’s smartphones, video games, tablets or the TV, so we’ll continue to see video games, apps and phygital products for that audience. For adults, I see an increased interest in “gamification.” I think any teaching methods that make the material more engaging and help with retention are always positive innovations.

Toys and Technology

New tools in the coming years will enable designers to conceptualize, model, present and fabricate our visions. They will also influence the toys we make. Technologies have always been embedded in toys. Increasingly, toy companies are integrating technology, an upgraded experience factor that is being delivered by digital devices. The question for designers is when it is appropriate to use technology, and how we use technology to increase and produce a better-quality play experience to further development. The challenge for designers will be to maintain tactile engagement and the value of learning in the physical world.

Play futurist Yesim Kunter explains:

Any technology that becomes a norm for the daily life of the culture will translate into toys. Technologies that are here to stay that we can’t imagine life before them will have the most significant impact on the future of play. Some of the emerging technologies such as AI, IoT, Advanced Sensors, Robotics, Drones will change the way we interact with things/ourselves and objects, which means toys will adapt into these new lifestyles. At the same time the backlash of screen time and need of being outdoors and in nature, soft skills (empathy, intuition, understanding of our emotions) and creativity will also become exceptionally important in the development of our future humanity, which means some toys will follow this wave.
In many toys, specifically those that use lights and sounds, the technology is just there to sell it off the shelf or for a limited out-of-box play experience. A rocketship that has sounds and lights is exciting for one play session, but has no more interest once the child has experienced that it doesn’t lead them anywhere. Technology can be limiting when building an experience that needs to be programmed with a beginning, middle and end. It is not open-ended. The scripting takes away from a child’s ability to pretend and imagine. It is someone else’s story.

The best use of technology is when it is flexible and adaptive; when it is used to motivate kids in play, to learn about technology and to use it to create in a way that they could not without it.

Smart toys, with their own intelligence through embedded sensors, respond through speech recognition and use accelerometers and other electronics for the child to engage with the toy. Some technologies, when combined, can animate the toy and give it a lifelike persona or personalize the experience or play for the child. Adaptation of new play technologies in education, health and science is a burgeoning field. The problems occur when the toy does too much for the child, not when the child is playing with the toy.

Making Custom Toys

We are all familiar with the process of designers creating toys and kids playing with them. Today, through the DIY and maker movements, the interest in sustainability, the value of artisan handcrafted toys, and the proliferation of toy innovation on social media, parents and children are encouraged to make their own toys. Customization and 3D printing allow kids to design their own toys, not just for themselves but for broader distribution. Making the toys is part of the play.

Manufacturing techniques in the toy industry are slowly changing too. Online tools for toy configuration, crowd-sourced products and on-demand manufacturing provide opportunities for mass-customization. Toys can be tailored to kids’ specific needs, and they can be treated as individuals. The co-design allows kids to take an active role and is an opportunity to create value in the toy. Mass-customization also offers great promise to reduce the waste due to unwanted products.

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<td><strong>Today kids are getting older, younger. Children are moving through play stages faster than they did in the past. Kids are growing up and transitioning away from toys and traditional unstructured play to digital experiences and gaming at earlier and earlier ages.</strong></td>
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Sustainability in Toy Design

What we choose to make for children needs to have a direct impact on progress. The question at the outset of every project lies in the trade-offs between
a product existing and the immediate benefits it produces. Professor Heidrun Mumper-Drumm suggests:

Put a high standard on the design and manufacture of children’s products. We don’t care about them enough to invest in them. Children are designed “down to.” It is as if someone said, “Let’s just put some glitter on it to cover up the seam, or a sticker because they won’t notice it anyway.” Working from a the approach of sustainability gives us a positive context to explore.

Toy packaging is a significant problem on its own; Professor Heidrun Mumper-Drumm added: “Packaging is designed to sell products. Toy purchases are often impulsive, and packaging is designed to encourage ‘I want it, and must have it.’ The packaging displays all of the pieces, promising more than it delivers when it is opened.” As designers, we can surely develop better solutions beyond shelf-appeal.

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**Inspiring Kids to Learn and Discover with Toys**

**Interview with Eric Poesch, senior vice president, Design and Development, at Uncle Milton Toys**

As the leader of the design team he is responsible for the conceptualization, development and design of products.

**As a product designer, what are the most frequent topics that you address when designing toys for kids?**

- Play value and engagement: Great toys provide open-ended play that encourages engaging experiences. They allow kids to use their imaginations, creativity and invent their own ways to play.
- Kid appeal: The product theme and styling need to connect with today’s kids.
- Ease of use: Features and function have to make sense. Designers always have to have in mind the target age range that you are designing for.
- Ergonomics: If it is held, looked through, strapped on a wrist, fits on the head, there is always that challenge to design for the child, but often accommodate an adult.
- Cost of manufacturing: How do you deliver an excellent experience for the right price?

**How do different design disciplines contribute to toy design?**

- Illustrators: Theme, style, color and detail.
- Brand managers: First, we need to ask and decide: Who the brand is genuinely targeting, the child or the parent/grandparent or both? In the science and learning space, we are often targeting the parent/grandparent.
- Graphic designers: Simplicity and impact of visual and written communication, make it kid friendly – and don’t presume that anyone is going to read. Make it as visual as possible. Put into words only what cannot be visually depicted. Include just enough written content to bring more significant meaning to the visuals.
- A brand logotype is critical, but more critical is establishing a strong, cohesive branded look that works across all of the products in a line to make a unified statement at retail.
- Packaging designers: Strong visuals and clear hierarchy (order of the visual read). If you try to say too much, you end up saying nothing. Packaging structure plays a role as well in the communication. An open box shows the value and quality of the product, while a closed box often means little to no blisters (clear plastic packaging) and less packaging cost and provides you a greater principal display panel for imagery that can bring the product to life and show it in action. How can we as designers create less packaging waste and use more sustainable materials?

**What cultural shifts will affect the things you make in the coming years?**

I foresee a split in culture, between those who have the means and adopt every new technology into their lives...
and those who may or may not have the means but choose to limit or exclude specific technologies.

The effect of technology on developing minds and the potential redefinition of play is most concerning. Unstructured, imaginative, inventive play is critical to the healthy development of future generations of kids. In the coming years, I know technology will enter into children’s products and toys in ways we can’t imagine today. I will always opt for products that encourage unstructured play and exploration while incorporating technologies that support real-world discovery and experiences.

What do you see as the role of a designer in the future of play?
Traditional, core play patterns are in danger of becoming extinct and being replaced by digital play experiences. Ironically, this is precisely what some toy makers are encouraging with the introduction of LCD screens and other advanced technologies into infant and preschool toys. Critical roles designers must play in the future are to uphold and promote core play patterns and unstructured play.

As a Dad, what are essential recommendations you have for designers to consider when designing for children?
Visit kids’ museums with interactive exhibits. Here you can observe kids at play and explore each of the exhibits. Note which exhibits get the most attention. Note the age range versus appeal per display. Which ones make the kids laugh or produce greater emotional responses and “wows” and why. Note what percentage of adults and/or kids are reading the signage and written explanations of each exhibit. Note how they interact with the displays and if the interaction appears to be as the designers intended or are the kids creating their own ways of playing and exploring the space.

And of course, be a kid yourself, play and explore and spend time at both the most popular exhibits and the least popular exhibits to try to determine the difference in appeal. Is it the subject matter? More hands-on versus less? Fixed interaction, versus more open-ended exploration and experimentation? Characters and/or colors? …

Define the experience you are trying to provide the child. Is it purely fun and whimsy or is there learning? If learning is part of the core experience, it still must be fun first, or it will not hold the interest of the child. The best experiences are those that provide learning as a result of play. Humor and emotional engagement along with engagement of as many of the senses as possible are best to connect with all children. Become familiar with child development. I have seen with my two children; each child is born a unique individual with innate aptitudes.

The Future of Play: 25 Topics to Know about Play in the Coming Years

This is my list for looking at what some of the leading topics and technologies around play are today. Use this list as a starting point for inspiration and to create your own vision of the future of play.

1. Personalized play: Users will build a cognitive profile, and products and experiences will adapt and respond to kids’ individual interests and abilities. Feedback loops will guide the behavior of toys and games over their lifetime.
2. Growing social dimension to play: There will be new ways to interact with others physically and digitally. There will be a shift of importance in child development areas from cognitive and physical development into more toys, games and experiences about social and emotional development.
3. Create and share: Kids will create their own toys, games and digital experiences at home, in community spaces and with mass-customization
manufacturing. Apps, robotics, 3D printers and back-end manufacturing systems will transform to provide flexible products and experiences. Brand engagement includes crowd-sourced product development and changes and updates throughout the life of products. Kids will share and distribute their creations with users worldwide.

4. Modeling different play behaviors: Traditional play patterns will remain the same (especially for the younger ages), but they will branch out and shift in priorities, for example, from constructive to pretend play. How play is acted out will change based on cultural shifts, technology and material resources.

5. More play in education: Technology and new media will address diverse learning methods in classrooms and in online education. Focus on using play for 21st-century skill building (problem-solving, thinking, collaboration and creativity) for all ages from kindergarten through college.

6. Play everywhere: Every time and place is an opportunity for playification and gamification. Play expands across industry sectors, including home, community, retail and healthcare. It happens during the bursts of free time in between other things.

7. Play outside: There is a renewed interest in playing outdoors. Tactile experiences will include playing with loose parts and nature, risk in active play, and exploration in natural wilderness and with biological systems. Technology will enhance natural experiences in context.

8. Open-ended play: Decrease in fixed predesigned object play and increase in open-ended toys, games and play experience.

9. D is added to STEAM: Creativity and divergent thinking and STEM and STEAM deepen and are elaborated into STEAM-D by adding design.

10. Seamless play tools: Technology will be seamless and off the screen. It will be embedded in the landscape, wearables, networked toys and experiences. Greater levels of wish fulfillment and heightened fantasy play will be achieved with new technologies, including VR, AR, MR, AI, robotics and more.

11. Universal design in play: Inclusivity/accessibility for special needs is no longer for compliance but to best benefit all users. It greatly expands beyond physical challenges to include more cognitive challenges.

12. Narrative interactions: A shift from things (toys) to experiences and immersive storytelling environments will allow kids to interact directly with their favorite characters in real time.

13. Design ethics: Designers expand into leadership positions and address research methods for play, gender stereotyping, violence, cross-cultural play and sustainability.

14. Play for social impact: Small non-profits model change around play, and larger companies build active foundations to support children’s rights.

15. Play throughout the lifespan: Kidult market, play in the workplace, play to a better self, and senior market expands.

16. Global play: Communities of like minds play online and across the globe.

17. Emerging markets influence play: What companies learn about play from research and distribution in China, India, Brazil, etc. will create a cultural mash-up of toys and characters with cross-cultural influences. Designers are challenged with global and regional design strategies.
18. Play for behavior change: The geography of play makes it easy for each of us to be our better selves. We learn to allow more time for play.

19. New design processes: The designer considers the benefits of the child in all areas of product development, including research, design, manufacturing, marketing, distribution and post-consumption.

20. Toys, games and advertising merge: As corporations continue to finance educational play experiences, branding becomes more integrated into everyday life through interactive advertising and new social marketing methods.

21. Social connectivity throughout phases of the play: Currently, people share completed products. Soon, they will share the creation process and play experiences with others through real-time data.

22. Kids and parents are more involved in what toys companies make: Crowd-sourced product development and manufacturing and new distribution models take hold and break down the current monopoly structure in the toy and game industry.

23. Democratic play, locally and globally: Bringing physical and digital play to small spaces throughout cities in underserved communities narrows the digital divide.

24. “Nutrition label” for play: A playability scale will standardize the measurement of skill-building properties, including fine and gross motor, cognitive, social and emotional, and creative. Each product’s play value will be transparent with a labeling system.

25. Best practices in sustainable design: Design for longevity is brought to the play market. Materials, packaging, processes and business models are readdressed for a closed loop system. Where and how toys are made and business practices will be more environmentally and socially conscious as consumers demand sustainability increases.

► Figure 6.20

Using autonomous intelligence, this interactive retail environment encourages customized hands-on social play.
Source: Jeremy Dambrosio, Harmonie Tsai, Jack Xu (Used with permission).
Design Prompts: Future of Play

- What does the future of play look like to you?
- How do your interests tie in with different types of play?
- How do you see some of the current play theories evolving in the future?
- Will technology improve and extend your design? If so, how?

Notes

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3. Gray, Peter 2010
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18. Kennedy-Moore, Eileen 2015
19. Gill, Tim 2010
20. Pontrella, Caitlin 2017
22. Kable, Jenny 2010
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34. Mott, Tom 2017
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