Endorsements for *Understanding Kids, Play, and Interactive Design*

“Fortunately for us, Mark Schlichting has created this marvelous book. By understanding and thoughtfully explaining what children do in the Kingdom of Play, and how and why they do it, Mark has provided a wonderful resource to those of us who would create fresh, invigorating playthings.”

—**Jesse Schell**, CEO, Schell Games; Distinguished Professor of the Practice of Entertainment Technology, Carnegie Mellon University;
author of *The Art of Game Design: A Book of Lenses*

“Mark Schlichting’s book, *Understanding Kids, Play, and Interactive Design*, combines deep wisdom about kids at play; comprehensive, clear (rare) understanding of play and “play science;” and the manifold practical routes to interactive game design. It is the magnum opus of a creative lifetime, full of usable details framed in engaging and visually captivating formats. As one steeped in the biology of play and its necessity for overall human well-being, Mark’s book pioneers the blend of ever present technology with culture-enhancing guidance for the next generation of play-savvy designers. Belongs on every kids’ play/game designer’s bedside table.”

—**Stuart Brown, M.D.**, Founder and President, The National Institute for Play;
author of *Play: How it Shapes the Brain, Opens the Imagination, and Invigorates the Soul*

“Children play in order to have fun, not to learn; but learning is the side effect that, from an evolutionary perspective, is play’s purpose. In this book, Mark Schlichting reveals a remarkably sophisticated and accessible understanding of play, learning, and children, including differences among children related to age, gender, culture, and personality. This book will go a long way toward connecting game designers to the minds of children.”

—**Peter Gray**, Ph.D., Research Professor of Developmental Psychology, Boston College;
author of *Free to Learn: Why Releasing the Instinct to Play Will Make Our Children Happier, More Self-Reliant, and Better Students for Life*.

“For over 25 years, Mark Schlichting has been an indispensable voice in children’s media. To those of us who’ve had the pleasure to know him, he has been a voice of wisdom and reason. To those lucky children who have discovered the products he’s created, his voice has been one of playfulness, surprise, and supreme silliness. In *Understanding Kids, Play, and Interactive Design*, Mark sets out the principles that have animated his work, starting with the deepest respect for the power and passion children bring to their play, and following up with a fierce determination to create digital spaces where that play flourishes. We will all benefit from the clear, well-argued, and generous way he shares his wisdom with the next generation of designers.”

—**Scot Osterweil**, game designer, Creative Director, the Education Arcade, MIT

“This book must be in every children’s interactive designer’s library. In fact, *every* interactive designer should read it. . . a few times.”

—**Warren Buckleitner, Ph.D.**, Editor, *Children’s Technology Review*

“TeachersWithApps has had the honor and privilege of working directly with Mark Schlichting on several projects. He brings a wealth of knowledge, insight, and passion to everything he touches. Every page of Mark’s new book brings another ‘aha moment,’ and I thought I knew a bit about children’s digital space. This book is the bible and a *must read* for anyone involved in any area related to children, education, and technology.”

—**Jayne Clare**, special education teacher, Co-Founder, TeachersWithApps

“Mark Schlichting’s new book, *Understanding Kids, Play, and Interactive Design*, is a fantastic resource—the best I’ve ever seen—for interactive designers and others who want to understand play and learning. Mark is a master creator of great interactive experiences. He’s dazzled us for decades with his really funny, endearing products. Now we can learn how he does it. Mark is thorough, precise, and incredibly generous to share his secrets of success. Reading Mark’s book, I want to go create new apps, better than any I’ve created before. Hats off to Mark! Don’t miss this book if you want to create great games children will love. It’s a classic that teachers and others should have.”

—**Ann H. McCormick**, Founder of The Learning Company and
Co-Founder of Learning Circle Kids

“*Understanding Kids, Play, and Interactive Design* is a much needed reference book in a space which previously has had little focused attention. Mark has created a very thorough and comprehensive guide which is both great for beginners and for more established developers in the field looking to further develop. I especially commend him on bringing gender and diversity issues to the forefront, since this is an important matter for our industry which is too often overlooked.”

—**Björn Jeffery**, former CEO and Co-Founder, Toca Boca

“Despite what the rest of the world believes, developing successful and engaging interactive products for children is anything but easy. I’ve worked in the children’s industry all of my adult life, and with every passing year have asked why a singular guiding source on how to make engaging interactive products for children does not exist. Finally the industry has a great new book, rich with professional best practices, case studies, and helpful advice from seasoned professionals. With Mark’s new book, the children’s industry takes one giant step forward, and end users around the world can’t wait for the results!”

—**Scott Traylor**, CEO, 360Kid and VP of Software Design, Wonder Workshop

Understanding Kids, Play, and Interactive Design

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Understanding Kids, Play, and Interactive Design

How to Create Games Children Love

Mark Schlichting

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This book is dedicated to all the children who may someday
be directly or indirectly touched by it.

To my children, Jerome, Jesse, and Aaron;
my grandchildren, Roman, Ryven, Cayden, and Theo;
and my stepdaughter, Nicole.
What they have taught me is immeasurable.

And to my beloved partner, Barbara Chase,
without whose love, dedication, and amazing skill set
this book might have never seen the light of day.

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Foreword

This is a book about a secret place.

A secret place called the Kingdom of Play.

The Kingdom of Play is vast, and only children are allowed to live there. Of course, we were all children once, and so naturally we were all once citizens of the Kingdom. Unfortunately, we can never fully remember it, probably because we are different people now than we were then. Adults tend to remember the Kingdom of Play as a place of rest, and while parts of it are gloriously restful and relaxing, in reality, it is far more often a place of challenge and risk-taking. The Kingdom challenges children physically, mentally, socially, emotionally, and spiritually. Play takes enormous energy, and well it should, for we are most alive when we play: play is how we explore the world, and how we learn best. This is why great educators must understand play. But how can we understand it, if we are forbidden to enter the Kingdom? Perhaps “forbidden” is too strong a word. After all, adults may visit, for a few minutes now and then, but with our adult minds we think adult thoughts, and awkwardly stumble, fumble, and tumble back into the adult world.

But we need entry, desperately! The Kingdom is full of what children love best: toys, games, and stories. Ironically, these are mostly created by adults. While adults are not welcome in the Kingdom, the toys, games, and stories adults create are very welcome there indeed. Children visit the adult world, peruse the things we make for them, and take the ones they like into the Kingdom. The very best ones take root in the Kingdom’s culture, and become part of the landscape of Play for years, decades, or even centuries. If only we could get in to see it happen!

Fortunately for us, Mark Schlichting has created this marvelous book. By understanding and thoughtfully explaining what children do in the Kingdom of Play, and how and why they do it, Mark has provided a wonderful resource to those of us who would like to create fresh, invigorating playthings. This book is a map to the Kingdom and an almanac of the goings on there, but most importantly, it is a passport, once again permitting you entry (*Finally! At last! It has been so long!*) to the Kingdom of Play. It will let you stay long enough for Mark to give you a thorough tour of the major landmarks, and to remind you (for you were once a citizen yourself) of the local customs and practices.

What gives Mark the credentials to serve as tour guide to this magical place? Mark is a digital pioneer who has devoted his life to shaping new media to improve the lives of children. I first encountered his work when I was at Disney, where his Living Books were considered exemplars of how best to create engaging, enriching digital story experiences for children. Later, I got to know Mark personally at the annual Dust or Magic conference, the best gathering for people who care about

creating top quality digital media for kids. As much as I learned from studying his Living Books, I learned even more talking to Mark. He always had such wise things to say because he knew so much about how children think and what they care about. Naturally, when I heard he was planning to put his lifetime of wisdom into a book, I was excited, and now that the book is a reality, I am pleased to say that it has exceeded my expectations in every way.

There are many books that study play academically, from a great distance. There are other books that give tips for making great games. But if you would like to understand the practical realities of play, so as to design the most powerful and transformative play experiences, I know no better way than *Understanding Kids*. Because Mark's career has spanned decades, his guidance isn't rooted just in today's fleeting technology but instead is presented in a timeless way, making it good advice for the technologies of yesterday, today, and tomorrow, covering crucial topics such as:

The etiquette of play: There are rituals and etiquette to play that most adults have forgotten about. Mark carefully reminds us of these – for in any kingdom, even the Kingdom of Play, if you gaucheely ignore manners and customs, you yourself will be ignored. Mark reminds us of the importance of designing an invitation to play, not wasting a child's time, and always remembering that the child is in charge of the play experience. Adults have the embarrassing tendency to ignorantly violate the manners of the Kingdom of Play, causing children to respond (appropriately) with eye rolls, frustration, and a quick tap of the “home” button.

Sorcery: Mark reminds us of what computers really are: magic boxes. Whether hiding in TVs, phones, or virtual reality systems, computers are magic boxes with rich powers that fascinate children, and this makes them quite welcome in the Kingdom of Play. These magic boxes can tell stories, have conversations, make things appear and disappear, solve problems, even create and destroy whole worlds. Using these powers to the utmost effect is the central purpose of this book.

Temporary parenthood: Mark is well aware that the best digital experiences are treated by the child as a surrogate parent, and he thoughtfully reminds us that our experiences should do what good parents do: encourage, allow flexibility, communicate clearly, set a good example, be patient, and treat children with love and respect.

Children change: The Kingdom of Play is a multidimensional space, and one of those dimensions is time. A child's time in the Kingdom of Play is not static – far from it. The very point of the Kingdom is to allow children to change and grow. As such, what children do there changes drastically during their time there. How and why they play, who they play with, and what they play advances and changes, and Mark gives careful accounting and examples of how and why play changes with age and how you as a designer can create experiences that help children to master the challenges of growing older.

The truth about education: Mark understands that for children, there is no difference between learning and fun, only a difference between interesting and not interesting. Learning and growing is the very point of the Kingdom, and Mark gives excellent tips on engaging a child's curiosity.

Gender: Another dimension, fraught with peril for designers, is that of gender. This can be a minefield where one wrong step leads to designs rejected by kids, or worse, play patterns that make kids feel rejected, when something in a toy or game implies that it isn't "normal" for boys or for girls to engage in certain kinds of play. Mark handles this sensitive issue deftly, with due care and consideration, illustrating each potential pitfall with good and bad examples from the real world of toy and game design.

Special needs: Some children have special needs, and as a result, their experience in the Kingdom of Play can be different. Through touching examples and stories, Mark shows how it is not enough to think about how to "accommodate" special needs, but rather, how to help kids with special needs use play patterns to heal and grow in ways that happen best in the Kingdom of Play.

And there is so much more in this wonderful volume. We, as adults, can never again live in the magical place that is the Kingdom of Play. But by following Mark's wise advice, we can help give children what they need to make the most of their short time in the Kingdom. And this is important work, for how they spend their time in this magical place will determine what kind of adults they become, and the very shape of our society.

So, turn the page already—your tour begins now!

—Jesse Schell, CEO, Schell Games, Distinguished Professor of the Practice of Entertainment Technology, Carnegie Mellon University

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Introduction

As a child I was totally captivated by the magic of animation and the fantasy worlds of children's picture books. I imagined going inside storybooks, such as Dr. Seuss's *Horton Hears a Who!*, to play with all the weird musical instruments and contraptions in Whoville. I followed my artistic passion as I grew, received a degree in Fine Art from California State University, East Bay, worked as a book publishing art director, and then went back to school to study traditional animation at San Francisco State University.

By 1986 I was a parent with Nintendo guilt. As the father of three boys, I watched their passion for *Mario Bros.* and dedication to achieving "level" mastery, but couldn't find a single program that was educational *and* fun enough to hold their attention in the same way. My boys, and their friends, would cooperate and work diligently for hours to get to the next level, but getting them to do 20 minutes of homework was an entirely different story. That was a big *aha* moment for me. My children inspired me to create programs that combined the attention-grabbing play aspects of great games with meaningful content. I wanted to develop titles my kids would love and learn from, and to inspire all children to follow their innate desire for play and learning through self-directed exploration and discovery.

My software career began as a freelance digital artist and animator for early floppy disc PC games like *Where in The World is Carmen San Diego?* But I already had a vision of highly interactive animated picture books for children, which was my inspiration for creating Living Books. Brøderbund Software, where I had taken a job to try and sell the concept of interactive storybooks, believed in my vision enough to allow me to create a small prototype in-house. Philips, the Dutch electronics hardware manufacturer, happened to come through on a tour and, based on my prototype, gave Brøderbund \$500,000 to make a title that would run on a new television set-top box player they were developing. All of a sudden, my little demo concept became a development group, and we dived into the problem of turning the single-speed CD-ROM drives of the day into responsive multimedia players.

As the first full-featured prototype of Living Books began to take shape, I immediately tested it with kids to see what tickled them, and I talked with teachers to hear what they wanted for their classrooms. There were a lot of technical issues to work through, but when we shipped our first title two years later, we created the first cross-platform authoring system that delivered a full-color animated multimedia experience. Our first title, based on Mercer Mayer's book *Just Grandma and Me* (1991), was an instant hit. The software came with three languages on one disc (English, Spanish and Japanese) and shipped with a copy of the original paper book.

Microsoft bought 300 disc copies and sent them to their hardware manufacturers, with instructions that this software was the standard for multimedia, and it needed to run on their equipment.

Just Grandma and Me, along with the eighteen other Living Books titles, went on to sell tens of millions of copies in multiple languages. One of the original Living Books stories is from my own children's book *Harry and the Haunted House*. Many of these titles have been rereleased for computers, tablets, and mobile devices by Wanderful interactive storybooks..

As the CD-ROM market declined in 1997, I went on to oversee creative development at JuniorNet, an early online children's network, and in 2000 I founded

NoodleWorks Interactive, a children's interactive design consulting and production company. Over the years, it has been my pleasure and joy to bring many well-known and beloved children's properties to the world of interactive digital content. I was the first designer to bring to digital life the works of Dr. Seuss, Marc Brown (*Arthur*), Stan and Jan Berenstain (Berenstain Bears), Mercer Mayer (Little Critter and Little Monster), Jack Prelutsky (*New Kid on the Block*), and other children's favorites. I also had the pleasure of creating digital content with *Ranger Rick*, *Highlights for Children*, *Weekly Reader*, *Zillions* (Consumer Reports for Children), *Sports Illustrated for Kids*, and Jim Henson's *Bear in the Big Blue House*, among others. In 2012 NoodleWorks published our own first smartphone/tablet app, *Noodle Words*. It was featured by Apple and won numerous awards, including a KAPi Award for Best Educational Product—something my team and I are very proud of.

My life for the last 30 years has revolved and evolved around the practice of understanding kids and creating award-winning software for them. I've consulted and lectured at LeapFrog, Fisher-Price, Stanford University's Professional Publishing Courses, Game Developers Conference, the Smithsonian, Pearson, Consumer Electronics Show, Dust or Magic Design Institute, Digital Kids, California Governor's Conference on Technology, and many more.

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Designers' responsibility. To be a creator of interactive content for children is an important responsibility. Today's children are tomorrow's leaders, and to offer them engaging developmentally and emotionally appropriate content is a worthy investment in all of our futures.

Children are the living messages we send to a time we will not see.¹

—Neil Postman, author

Children are drawn like magnets to technology, and this book is dedicated to supporting designers of children's technology in creating ever more wonderful and appropriate software activities. Many of the best children's interactive designers came into this line of work because of the sheer joy of creating lively content and because of the opportunity to make a difference for children. The pleasure of creating something fun each day (thinking like a kid) is a joy unto itself and helps sustain designers and producers through the sometimes grueling process of bringing products to launch.

Over the years, I have met and heard from many kids who have enjoyed my titles. Some were learning a second language; others benefitted from the sense of surprise and joy they got from playing. One autistic child learned to speak; many have learned to read; and all, I hope, felt empowered, gained a sense of control and confidence, and became agents of their own change even in their lives off the computer. To a designer there, is no greater satisfaction than to have one of your end users come back and tell you, often years later, what a difference your creation made to them.

Interactive software is no substitute for love and human touch, or the modeling of a great teacher or caring parent. Interactive media is, however, an opportunity for kids to explore subjects at their own pace in a learning process that interests and delights them. This book is offered as a toolkit for making emotionally satisfying digital toys. It is a gift to future designers and to all the children who may eventually touch something influenced by its contents. I hope it will help inspire new designers to see the world as kids see it, and to feel as kids feel.

Why read a book about interactive design? Especially if you've already had success in creating games or apps for kids, reading a book might not seem necessary. But where do you go to learn what you need to know—or to get new ideas to take your designs to the next level of child engagement? When I started out creating products for kids, there were no books on the subject. Interactive media was still in its infancy, and we made things up as we went along, paying attention to what worked and what didn't work. Many designers have an intuitive sense about what will tickle kids' funny bones or keep them playing a game for hours, but understanding why those choices work well, and learning other tips and techniques, can help you to take your design to the next level of engagement, or explain your choices to decision makers.

This book came about as a way of sharing insights empirically gathered, over decades of interactive media development, by myself and other children's designers. I have included as much emerging theory as possible in order to provide background for practical and technical aspects of design while still keeping the information accessible. My intent for this book is not to create an academic treatise but to furnish an insightful and practical manual for the next generation of children's interactive designers.

Play patterns are device independent. Even though I love to talk about new media technology and the wild possibilities of what we can do with it creatively, I have stayed away from tech talk in this book because technologies change way too fast. More importantly, technologies come and go, but the timeless nature of human interaction, childhood play, and innate learning are constant. In this book, you won't find code or recommendations about the best graphics program to use. What you will find is in-depth, usable knowledge about the art of creating great multimedia products that appeal to and delight children. You will learn what speaks to children at different ages, and how to apply that knowledge creatively. The intent is to inspire and inform you to become a greater designer and producer.

This book is meant as a resource both for designers who are just starting out and those who want a better understanding of their craft. It is a result of over 30 years of designing for kids and figuring out the science and psychology behind that magic moment when a child playing a game starts laughing out loud or shouting with excitement.

What I mean by *kids*. For the purposes of this book, I define *kids* as children between the ages of three and twelve. Below three they are toddlers and, at thirteen, they are officially teenagers, and by their own account, wish to not be considered “kids.” The three-to-twelve age group is fun, lively, and full of rapid developmental changes, growth, and evolving social, intellectual, and physical skills. This book serves as a road map to help connect with the needs, wants, passions, and desires of children everywhere.

All play is educational. There is no one large section of this book that exclusively addresses “educational” content as a separate category, but examples of great educational content and how to create it are peppered throughout. When children are engaged in true play, they are learning, and the goal of this book is to help designers develop interactive experiences that tap into that natural desire to explore, no matter what the subject.

The term *interactive design* means different things to different people. What I consider most important in what I do is the philosophy behind the technology. This can be summarized in one sentence: *Connect with children's natural play instincts to empower their learning.* From the smallest detail of an interface to the largest concepts in a game, this idea informs everything I do. Even when designing a program specific to learning, natural play patterns are tremendously important. Why?

We all learn differently. If you go to a typical classroom, you'll see that some kids take to sitting at a desk with a book in front of them. Others wiggle around, look at anything but their books, make noise, cause distraction, and are generally unhappy or bored. They're not bad kids. They just don't learn best by sitting at a desk. The traditional institutional model of learning is not for everyone—it wasn't for me. Today, teachers are adding diverse approaches to educational content to reach kids who need something more than lectures and workbooks.

A huge component of helping kids learn is engagement. When a child is engaged, learning happens because the process has become like play. It's easy to make a flashcard for a kid to memorize, but it's better to foster a deeper kind of learning. When kids are happily engaged in playful learning games, they are not only spending time on task but also driving their own learning and creating a love of learning that will serve them throughout their lives. True play is part of emotional well-being. But, as a designer, how do you make that happen?

Play is universal. It transcends different kinds of learning modalities, meaning that kids learn more easily through play than through traditional classroom instruction. When kids play, they may not be learning spelling words or fractions, but they're learning. The point of an interactive game is to offer learning through play because play is the single most important thing kids do. It's what they want and what they are instinctively drawn to do. A lot of us understand play intuitively, but when we are faced with creating a play activity, we can't always duplicate the conditions for a spontaneous play experience. We can't always explain what makes something fun, but I have done my best in this book to share those little secret moments that set the conditions for play to happen spontaneously.

The stakes are high when it comes to inspiring children to learn. A child's instinct is to learn about the world. It is the designer's job to understand this instinct and to facilitate the process of learning. Play, passion, and purpose are the foundations of innovation. Part of why I wrote this book is to get designers thinking differently about the products they create, so they'll develop games and interfaces that offer opportunities to get kids excited about learning, thinking, and innovating.

Self-directed play is especially important. Over the years, modern kids have lost opportunities for self-directed play and exploration because these opportunities used to occur in the physical, external world outside of the home. One hundred years ago, kids may have had a ten-mile roaming radius. Even a few decades ago, kids wandered their neighborhoods, played in vacant lots, explored old buildings, collected bugs, you name it. They did dangerous stunts on their bikes or built secret forts. Their parent-free radius might have been a couple of miles. Now it is more common for all children's activities to have parental supervision. Play is often adult-controlled, or at least adult-sanctioned and -refereed. Free time to play outdoors, exploring with their peers, is a thing of the past for many children. The parent-free radius may be as limited as the backyard or the apartment when no adults are home, and play companions may be only siblings.

The situation doesn't need to be so grim. There are ways for children to explore, play, invent, and interact in digital worlds without the (adult-presumed) dangers associated with unsupervised real-world exploration. I'm not advocating digital worlds over real-world exploration, but in the absence of real-world possibilities, digital worlds can be—and are—a venue for children's creative impulses and self-directed endeavors. Design should support the kind of freedom kids had when they could wander their neighborhoods alone. Self-directed play experiences create adults who

have the innovative and creative thinking to change the world. If you are not creating products that speak to kids and their natural desire to play, you are failing them.

Self-directed play allows development of a child's relationship with the world.

Without self-directed play, it is very difficult to form that relationship. If kids can't have physical territory for self-directed play, let them have digital territory for wonder and exploration. Play is the starting point of this book because it is the starting point of learning. Leading developmental psychologists like Peter Gray emphasize this idea. The growth of the homeschooling and unschooling movements are evidence that traditional educational models or methods of instruction are failing many of our kids. It is our job to step up and provide ways for all kids to learn the skills they need to succeed.

Giving kids self-direction does something else: it creates intrinsic value in your product instead of external or imposed value. An imposed value could be to master fractions in order to pass a test. Intrinsic value offers inner motivation, engaged learning, real retention, growth, joy, and the desire to do and learn more. A great fractions program will offer that.

What you'll know by the end. Within these pages are hundreds of examples of effective interactive designs for children gathered over thousands of iterative cycles of user research and experimentation. With highlights gleaned from a wide history of products, this book contains the best and most usable design tricks and techniques for creating winning, child-focused experiences.

You will learn the best uses of color, animation, sound, character development, and interface design to get attention, support accessibility and usability, and generally empower kids' interactions. Most importantly, you'll learn how to understand and use play patterns to make great products that kids will love.

Our children are humanity's future. How we empower them and what we teach them will affect who they are as adults in the world. A child's job is to learn about the world they have been born into, and they are naturally voracious consumers of experiences and information. The quality, safety, age-appropriateness, and general joy of what we offer those open minds and hearts is very important. As designers of children's content, we have a responsibility to support and nurture their growing developmental process in the best ways possible. I hope by the end of this book you'll become an advocate of engaged **play**, and a master of the magic that comes with understanding the art of interactive design for children.

The great man is he who does not lose his child's heart.²

—Mencius, Confucian philosopher (372–289 B.C.)

PART 1

Sparking Interactive Magic

What makes an interactive experience compelling for children? What turns a simple click or tap into a magical interchange? Truly engaging interactive content for children is a blend of psychology and technology that listens and responds to kids' interests. To create great products for children, designers need to understand the nature and value of intrinsic play, dynamics of attention, and strategies for continued engagement. Knowing what delights and excites a child's imagination allows you to deliver a satisfying experience that brings kids back again and again.

Play is the only way the highest intelligence of humankind can unfold.¹

— Joseph Chilton Pearce, author

*Children are our real teachers.
Listen carefully and they will teach you
about the lost world
of carefree being in the present moment.*

—Tibetan wisdom

CHAPTER

1

The Power of Play

Why start a book on design by talking about play? Because play is what children do, how they learn, and *what* they are doing while in a designer's program. For both the user and the designer, play is the primary component and the goal in good design. The bulk of this book is about how to create dynamic, engaging play experiences. It's important to begin by knowing more about play itself. Children often use the word play to describe activities they don't *have* to do. Kids consider play to be pleasurable, and, for them, tasks that aren't fun aren't play.²

For great children's design, play is not *an* essential ingredient, it is *the* essential ingredient. Play is instinctive for kids, and it is how they are wired to learn naturally. To recognize and comprehend different patterns of play is paramount in creating interactive experiences that invite and support continued involvement and exploration. This chapter covers various aspects of play, how to recognize it, and what it means to kids.

*Play is often talked about as if it were a relief from serious learning. But for children, play is serious learning. . . . Play is the real work of childhood.*³

—Mister Rogers

The Importance of Play

Play is not frivolous or trivial in its impact on humans. It is a basic biological and psychological function that supports our health and well-being in countless ways each day, lowering our stress, helping us learn new skills, or facilitating congenial relationships. When we play, we open ourselves to new possibilities, insight, and creativity. Playfulness helps us view life with optimism, create new options by testing alternatives, and develop social coping skills for a happier life.⁴

We have all seen the joy on children's shining faces when they are deeply engrossed and engaged in play. Play is what kids do best. It is essential to a joyful life, and it is an instrumental partner in learning.

What We Learn Through Play

In addition to social skills, children develop motor skills, spatial sense, creativity, organizational and classification skills, observational skills, abstract thinking, and hand-eye coordination through play. This applies to digital play as well as real-world physical play. For example, a game like *Tetris* involves many of the same spatial and pattern recognition skills as building with wooden blocks.⁵ A good digital product will leave room for creativity, open-ended play, and self-direction, the same qualities that make more traditional types of play so important to growth and development.⁶

What else does play do? It may surprise you to know that pretend play improves language acquisition and facility with numbers.⁷ Social play and collaboration also contribute to literacy.⁸ Classification and observation skills employed in many digital games and activities are the same skills useful in learning science.⁹

Play is central even to games or products whose primary function is to teach, rather than to entertain. Children master new tasks and abilities through practice and repetition, and we are all more likely to repeat something when we enjoy doing it.

When children are playing and having fun, they are also more absorbed and more likely to spend extended time on task. This depth of concentration is important in all aspects of life, from childhood to adulthood. Not only that, but in a state of play, kids learn in a different—and often more effective—way than they do when they’re working or studying in a traditional classroom setting.¹⁰

Play in the classroom. Play doesn’t just help kids have better concentration and focus. It also reaches out to many kinds of learning styles, something traditional classroom methods can’t always do. For example, a school system invested in the phonics method may have trouble reaching students who see things from a whole language approach, or a student with delayed motor skills may struggle to master early writing. Learning delays, ADHD, and autism-spectrum issues may compound the difficulty. Play distinguishes itself from traditional approaches because it engages innate learning patterns and methods.

A key characteristic of many kinds of play is the use of multiple senses (not just vision, but hearing, touch, and physical movement). When all the senses are engaged, it also happens that learning is improved.¹¹ Schools are catching onto this idea, and they’re beginning to use methods like kinesthetic learning (e.g., learning reading through movement) to motivate nontraditional learners.¹²

Too much instruction impedes involvement. Although many children learn a great deal from direct instruction, research has shown that some pathways of discovery are closed off when too much direction is given.¹³ Young children *decrease* exploratory play with a toy when its use is first demonstrated by an adult.¹⁴ Similarly, the amount learned by playing a video game, which allows creativity and self-direction, can be drastically higher than the same content learned through a lecture.¹⁵ Yet traditional styles of teaching in early primary school rely on this kind of direct pedagogy: students imitating teachers or teachers directly instructing students. Minimal or no instruction, on the other hand, leads to exploration, experimentation, and discovery, which means more time spent with the toy or game.¹⁶ Regardless of whether you want a child to learn from your product, these principles apply. Understanding basic phenomena like these allows designers to make decisions that maximize the time a child wants to spend with a product.

*Anyone who tries to make a distinction between education and entertainment doesn’t know the first thing about either.*¹⁷

—Marshall McLuhan, philosopher of media theory

Good design is important. Parents and teachers appreciate when a game or toy fulfills the dual purpose of entertaining as well as teaching. There are many products for children that are described as “educational” for parents’ or teachers’ sake, but many of these products fail to inspire the child. When an interactive title is designed correctly, children want to get their hands on it. Tapping into innate childhood play patterns and interests transforms a dull subject into a delightful

experience. All of this means that what you do as a designer is incredibly important.

Respected psychologist Peter Gray draws two connections between play and learning that are useful for interactive designers to consider: First, that curiosity is complementary to play, motivating exploration and learning; second, that an exploration process often precedes play—a child will explore a new item or device, then, gaining confidence, will begin to play with it. The key takeaway for a designer is that a toy or game must offer opportunities for exploration and rewards for curiosity. These qualities will encourage play. A desire to play means a desire to repeat processes and practice skills, the foundation of mastery. Further, Gray writes that play is the primary component of what education specialist Sugata Mitra calls “minimally invasive education.” The desire to learn comes from the desire to play, not from a promised external reward like a good grade.¹⁸

Kids are naturally curious. Young children in particular are naturally entranced by the magic of life. They love to explore and experiment. You can see this while watching children at the beach as they let grains of sand run slowly through their fingers. They are learning about relative size, granularity, gravity, texture, heat absorption, and more, but what they are doing is playing. They explore something until they have learned what they can about it at that moment. No one has to tell kids to do these things. They do it because it is in their DNA to interact with the world and uncover how things work. Curiosity drives them to experiment, and the consequent insight impels them into further research and experimentation. Curiosity is not some-

thing to be afraid of, as in the old admonition “Curiosity killed the cat,” but a quality to be embraced, supported, and developed.

Play is a child’s favorite way to learn. It’s how they are wired. Through play, children can pretend, explore, and rehearse. They can creatively experiment with real-world problems, but in a safe environment. They can try things out without endangering themselves. After all, they are “just playing.” Play is how we all best learn something new, and ultimately how we learn about learning. Ben Franklin was one of many philosophers to express the notion, “Tell me, and I forget. Teach me, and I remember. Involve me, and I learn.” Interactive design is at its best when it creates inviting and supportive environments that replicate the involved, self-directed exploration and discovery that kids have been exhibiting for millennia.

Kids need self-directed play and independence. As mentioned in the introduction, today's children often have more limited opportunities for self-directed and independent play than children of the past. At the same time, some schools, constrained by budgets and resources, are doing away with recess. Yet studies show that children who don't have time to play are less able to sit still in a classroom. Without recess, they also miss out on valuable socializing that helps them to learn interpersonal skills and conflict resolution.¹⁹

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Play is an increasingly important aspect of school curricula because of its universality, its contributions to information retention, and its appeal to different learning modalities.

Game-based learning is gaining traction in school curricula²⁰ because educators recognize that children learn in many different ways, and play is one of the most effective. Educational games provide flexibility to teachers and offer students practice and learning via multiple methods and approaches, as well as a refreshing change from traditional instruction. Children often play on their tablets, phones, or computers, and this can happen in the classroom as well as at home. Increasingly, mainstream classrooms can access newly developed educational games released on the Apple and Android platforms, due to school district investment in mobile devices—as well as the Bring Your Own Device movement, which addresses the need for inclusive access to devices for students. In response, games for kids have experienced a flush of development in recent years, but they too often employ the “flashcard” mode of learning, where children are expected to watch, listen, and repeat, rather than engage with the content in an interactive, playful way.

*You can't really fail at play.*²¹

—J.C. Herz, author

Some students shut themselves off from learning due to frustration with early experiences, becoming “reading averse” for example, and even students who respond well to traditional pedagogy may become bored with it over time. In addition, being observed and monitored (i.e. graded, tested, evaluated) can decrease success in learning for those who are struggling.²² Performance is improved when an activity is done for intrinsic reward.²³ Grades and test scores are an *extrinsic* reward. Play is something we do for ourselves (for intrinsic reward), not for a measurable result by others, even when we're competing on a sports team.

Educational games and toys, especially the short-form games that are most accessible to the classroom model,²⁴ can address this need for compelling, interactive learning that appeals to both traditional and nontraditional learners.

The Biological Roots of Play

Play, in all its forms, is not just a human trait but a mammalian trait. You can witness it with your pets and with mammals in the wild. In fact, we are drawn to, entertained by, and love watching animals at play. There is something so charming about it that it has spawned countless YouTube channels.

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Psychologist and play researcher Peter Gray discusses the seminal idea that “play in animals ... is essentially an instinct to practice other instincts.”²⁵ Young monkeys play at swinging between tree branches, lion cubs practice stalking and pouncing, and young zebras play at fleeing and dodging. While some survival abilities are innate (fight or flight, for instance), many of the skills we use in life are acquired through experience. Play is the way we (and other animals) practice and perfect these skills. The larger the brain size (in proportion to the body size), the more playful the animal.²⁶

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The desire for play comes from something instinctual and deep inside; it is a powerful motivating force that drives us to interact with the world. For designers of kids’ content, true play is the essence of the kind of engagement we aspire to ignite.

Categories of Play Patterns

Children intuitively create learning experiences for themselves through a variety of creative play inventions that tend to fall into a few simple categories: **Active Body Play**, **Mastery Play**, **Social Play**, **Object Play**, **Creative Play**, and **Make-Believe Play**.²⁷ These classifications are for the purposes of discussion and to facilitate recognition of play patterns in interactive design. Children don’t create these categories or label their play in these terms. For them, all types of learning are woven together and happen at the same time.

Recognizing and understanding play patterns is essential to children’s content creation because every program you create as a designer will, intentionally or not, offer opportunities for one or more of these patterns. Enhance designs to support pure play, and you will create titles that delight as well as enlighten.

Active Body Play

Children love to use their bodies. Active Body Play is primarily physical exploration and movement done for the sheer joy of doing it. This could also be called **Sensory Play** because it stimulates the five senses: sight, sound, touch, taste, and smell. Swinging on a rope, climbing a tree, chasing each other around, jumping crazily on the bed—there doesn't need to be a reason; all there needs to be is the opportunity. Much of what babies and toddlers *do* is pure active play because it stimulates brain development, develops motor skills, naturally builds growing bodies, and teaches them about the material world.

Physicality is crucial for optimum growth both in the body and the brain, and it feels good. Testing the limits of their developing abilities, kids invent impromptu games wherever they go. They will make a game of jumping between rocks, standing on one foot at a time, or taking off running for no reason. They will invite anyone nearby to participate, thereby also turning the game into Social Play.

We explore the world through movement; it's a crucial ingredient for learning. As Maria Montessori pointed out in her 1936 book *The Secret of Childhood*, “Through movement we come in contact with external reality, and it is through these contacts that we eventually acquire even abstract ideas.”²⁸ Active use of the body during play is also how children begin to create context for language. Through movement, they experience concepts of space (here or there), time (now or later), and speed (fast or slow). Experience becomes a way of knowing and learning.

All kids need physical playtime. More and more designers are taking this into consideration as they try to find a balance between the amount of time children

spend being physically active and the time they spend playing on digital devices. Games like the foot-controlled *Dance Dance Revolution* were a start, but Nintendo took it to the next level with the Wii and its sports and fitness games. The Kinect for Xbox uses game hardware to recognize the outline of the user's body. This allows movements to affect gameplay by putting the player on the screen. We can look forward to seeing even more sophisticated interfaces in the future, interfaces that allow Active Body Play as the key interface control.

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Mastery Play

Mastery Play takes several different forms: exploration, repetition, and problem solving. As children grow, they are constantly learning new skills. (In fact, all through life, we continually master new skills just to keep up with technology.) For the youngest children, Mastery Play is the dominant pastime since everything is still new to them, including their bodies. They are still mastering the basics of standing, walking, and getting their bodies wired to do what they want. In older children, mastery learning takes on more and more levels of refinement, from acquiring intricate dance moves to honing the finer points of a sport or a game (like any Mario game) where progressive “controller” skills are required in order to move forward. All play involves skill development, whether physical, intellectual, or emotional. Once a skill is gained, the next impulse is to play with it. Mastery leads to **exploration** and **experimentation**.

For example, the first time children go down the playground slide, they hesitate at the top; it seems really high up, and they will have to give up control to go down (somewhat scary and outside their comfort zone). They don’t know what it will feel like or what will happen. There are a lot of unknowns despite the fact that they have seen lots of other kids do it. At some point, they throw caution to the wind, try sliding, land, integrate the experience, and *do it again*. **Repetition** is a big part of mastery. It builds confidence and adds to a child’s database of experiences. (Q: How do you get to Carnegie Hall? A: Practice.)

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Over time, children gain even more mastery of the “slide” experience, and begin to play with it. The next thing you know, they are going down the slide upside-down-and-backwards, head first! A few years later the tween child wonders, “What happens if I ride my skateboard down the slide?”

Mastery Play takes many forms for a child. Consider **Language Play**. We are linguistic animals, and children instinctually engage in Language Play while learning to talk. No one has to teach Language Play to them; they do it on their own by playing with sounds and listening

to people around them. They begin with cooing sounds, then progress to a kind of babble as they put vowels and consonants together to resemble words in their native language. First words will be repeated over and over in a playful way. Babies only do this when they are happy.²⁹ They do it not to achieve something but because they can, and it's a pleasurable exploration, which is, by definition, play.

The main form of Mastery Play could be called **Exploratory Play**. In order to understand how things work (both inside and outside of themselves), children need, and like, to explore and experiment. This becomes a **Strategy Play** activity that deals with the discovery of properties and rules through trial and error, sometimes called **What-If Play**. Experimentation leads to insights, hypotheses, and new exploration. There is such an inherently satisfying pleasure in solving *pieces* of puzzles that the completion can be anticlimactic. Solving one problem inspires children to try solving another one.

Again, mastery leads to exploration, experimentation, *and engaged learning*. Later chapters will talk more about *level* mastery and how it is used in gameplay, but, for now, consider how learning is an aggregate of all things mastered and learned previously. Mastery Play is an element in every human activity.

Social Play

From games with a few friends, to organized gatherings and sports, humans enjoy doing things with others. If we didn't care about connecting, communicating, and playing with others, social networks and game sites would wither on the vine.

This social connection to others begins at infancy with **Attunement Play**, the intimate interactions between parents and their babies that are crucial to development. Attunement Play sets a foundation for complex versions of play later in life.

When an infant makes eye contact with her mother, each experiences a spontaneous surge of emotion (joy). The baby responds with a radiant smile, the mother with her own smile and rhythmic vocalizations (baby talk). This is the grounding base of the state-of-play. It is known, through EEG and other imaging technologies, that the right cerebral cortex, which organizes emotional control, is 'attuned' in both infant and mother.³⁰

— National Institute for Play

Children are naturally social, especially with other children. Children of about the same age and size are drawn to one another. You can see this most often with younger children who share a pint-sized view of the world and have a common wish to relate to someone like themselves. Young children who have never met before will connect and play together through self-initiated games. These impromptu games are easy to engage in and enjoy since the participants are often at the same developmental stage and skill level. They “get” each other. The dynamic is no different in electronic or

online games: the mere visual presence of other kids in virtual worlds adds a level of excitement for potential interaction.

In his book, *The Power of Play: Learning What Comes Naturally*, psychologist and author Dr. David Elkind writes that kids live in a world that adults have made and that is made for adults. Therefore, when kids meet other kids, they have common ground and feel they’re meeting people like them. They don’t need a common culture or language to connect. **Kinship Play** embodies this connection.³¹

When children are engaged in Social Play, which is *any* play done with someone else, they are exploring and experimenting with everything from humor to social justice. Children are busy trying to understand the world and explore how it works. Social Play teaches us lessons about ourselves and how to live with others.

Adults don’t always perceive exactly what it is kids are learning at any given moment. Will Wright, creator of *SimCity*, *The Sims*, *Spore*, and many other great programs, tells a story about himself and friends as kids playing with “army men” figures in the dirt. He realizes now that, when they would argue about the rules of play and what was fair, they were actually learning about the law and what was right.³² It’s a great observation because, as adults, we might just see two boys playing in the dirt without considering what the boys are learning as they play.

Cooperative Play and **Competitive Play** are forms of organized Social Play that often happen at the same time in team activities. Cooperative Play is characterized by teamwork and a sense of shared purpose toward a common goal. Competitive Play is characterized by setting goals with two or more opposing sides, each attempting to reach the goal first. (Competitive Play is not always social because kids will also create spontaneous self-competitions as part of skill building to see how many times, or how long, they can do something like keep a hula-hoop going or jump on a pogo stick.)

Some play has no obvious goals or rules; this is often referred to as “unstructured” or “open” play, whereas play that has clearly defined goals and a structure based on rules gets called “a game.”

Object Play

Touch is primal, and there is inherent joy in playing with objects, physical or digital: this is a deep-rooted, innate play pattern. Manipulating, experimenting with, collecting, sorting, organizing, and making things with objects comes naturally to our species, and kids invent this kind of play with whatever is at hand. The objects chosen influence and inform the direction and state of playfulness. For older babies and toddlers, banging on pots and pans with a wooden spoon is one way they learn about the physical world around them. As children develop, playing with objects becomes more personalized because toys are often imbued with human qualities and become the vehicles for imaginative **Storytelling Play** and **Fantasy Play**. Different objects lead to different explorations, connections, and expressions. Play with toy cars is going to offer different opportunities for exploration than a coloring book or action figures and dolls.

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One form of Object Play is collecting, sorting, and categorizing objects. Games naturally arise out of manipulating sets of objects. Object Play can take the form of creative **Expressive** or **Maker-BUILDER-Creator Play**, where something new is made from the pieces available. It can also consist of **Sorting Play**, which can be about finding relationships between the objects just for the joy of it. Look at the popularity of games like *Tetris* (fitting shapes together), *Bejeweled* (finding three in a row), *Solitaire* (finding a sequence of numbers), or word games like *Wurdle* and *Words with Friends* (finding words in a jumble of letters). They’re all based on the challenge of finding and organizing objects into patterns, often with the added motivator of a time limit.

Subsets of Object Play, **Collecting Play** and **Classification Play**, involve the assembling, sorting, organizing, classifying, and displaying of objects. Younger kids seem to be collectors because they like accumulating lots of stuff, but at around seven or eight years of age, collecting becomes more earnest, and kids become more discriminating accumulators.³³ They become very focused on discerning all the various and different properties of their collection pieces (and they are happy to tell you all about them if you ask). Baseball cards were popular collectibles for decades, but these days Pokémon cards speak to this same desire to collect along with the added bonus of being usable in gameplay as well.

While collecting and organizing are more intellectual than physical, the physical manipulation of objects has an important impact on the development of the brain. As children's skills in manipulating objects (through play) develop, the related circuitry of the brain becomes richer in ways that go beyond motor skills. Neural connections used regularly become stronger and more complex. Dr. Stuart Brown (founder of the National Institute for Play, a nonprofit dedicated to the science of play) and renowned neurologist Dr. Frank Wilson have noted this relationship in their research, and it is a crucial connection to keep in mind when designing games for children: involving the body and motor skills means developing the mind.³⁴ One way this idea of kinesthetic learning is being used successfully in the classroom is with Body Phonics, a way of teaching spelling with hand gestures and other motions.³⁵

Creative Play

Calling a category “creative play” is somewhat redundant because *all* play is creative in its own way, but in Creative Play, something new is being made during the process of playing (the explorative and expressive *process* being the important

part). Creative Play happens spontaneously and effortlessly wherever and whenever kids are given the opportunity. Examples include arranging shells on a freshly built sandcastle, painting digital pictures in apps like GIMP, Tux Paint, or Kid Pix, or building anything in *Minecraft*. But creativity happens best in an environment without pressure to be creative. High incentives, deadlines, evaluations, and other pressure to perform well all interfere with creativity. What's important is to let kids focus on what is being created, and to create for its own sake.³⁶

Creativity is an outcome of curiosity and playful exploration. Creative Play opens the door for improvisation, serendipity, and innovation by recombining elements of the known in new ways. It allows the mixing together of different ideas, fields of knowledge, points of view, techniques, and technologies into new, imaginative expressions. Because kids love this kind of play, designers should include opportunities for creative exploration and play in every program and game they design.

In learning, it is more powerful to make a playful and engaged connection to content than to have it presented as predigested fact or equation. One method is inviting and stimulating; the other is just memorization without personal ownership.³⁷

*Play, by definition, is self-controlled and self-directed. It is the self-directed aspect of play that gives it its educative power.*³⁸

—Peter Gray, author and psychologist

Part of Creative Play is **Transformative Play**, play that involves customizing, personalizing, reorganizing, and constructing—basically changing the state of something to make it one’s own. For kids this sometimes means just signing their name, but, more often, it includes decorating, enhancing, and otherwise modifying something (like a game avatar or a toy) to make it uniquely theirs.

The important thing for designers to remember is that Transformative Play, like Creative Play, creates *ownership*. Ownership, in turn, fosters player retention and continued participation. Everyone likes feeling creative, and everyone is creative in their own way. Part of the role of a designer is to help children be prepared for a world that thrives on innovation and change, where creativity is currency. Therefore, we need to create programs that foster the opportunity and mindset for creative exploration and discovery to help kids prepare for the world they will inherit. (For more on player retention through Creative Play and Transformative Play, see Ch. 3, pp. 42–44 and Ch. 16, pp. 265–270.)

*I think it’s possible that human imagination shines brightest in childhood. When I create games, I’ve always tried to think of ways for kids who play to think on their own and be as imaginative as possible.*³⁹

—Shigeru Miyamoto, game designer and producer at Nintendo

Make-Believe Play

Whether by playing with dolls or action figures or by dressing up as a favorite superhero, animal, or animated TV personality, role-playing happens spontaneously as children use their imaginations to explore social interactions or to “try-on” archetypes and roles to see how they feel. **Pretend Play** is an important and natural expression of kids trying to make sense of the world around them. From pouring out pretend tea for stuffed animals to battling make-believe bad-guys in the bedroom, **Imaginative Play** allows kids to explore things from different emotional viewpoints. This ability to see from different perspectives helps children to develop empathy and connection with others, as well as to give themselves coping skills.

Designer's Note

Whether we realize it or not, when we are designing games for kids, we often imagine them playing with the games, and, as I write this book, I am imagining you reading it and what you might like to know. We use this imaginative and creative mechanism easily and seamlessly in our thought processes each day. Often, it is virtually invisible except when we imagine things that scare, excite, or tickle us, and get our bodies to react as if the imagined scenario was real. Our imaginations are very powerful—imagine good things!

Make-Believe Play, also called Imaginative Play or Pretend Play, allows for the creation of “What if?” situations like being a pirate, a superhero who can fly, a beauty queen, a fairy princess, or a mash-up of beautiful-pirate-fairy-princess-who-flies. Anything imaginable in the mind of a child (or adult) is fair game for make-believe adventures. *Imagination* is something humans excel at; we can imagine things and times beyond the here and now.

Children have a huge appetite for explorative excursions and adventures into the fantasy world of make-believe, with themselves playing leading roles. They easily jump back and forth between reality and fantasy play, existing in both worlds at once. Make-Believe Play is always accompanied by some form of running narrative and story, usually broadcast live in monologue as it occurs. These stories help children make sense of their lives and sort through their feelings and experiences.

It's not just children who do this: everyone everyday uses a pretend-real combination to replay old stories, re-examine current situations with different outcomes, and envision possible future events. It is a daily component of our human stream of consciousness.

Make-Believe Play is often therapeutic on its own, but there is a specific form of **Therapeutic Play** used by child therapists to get kids to communicate about what is happening in their lives. Children who are reticent to talk will often, while talking *through* puppets, dolls, and figurines, express themselves in ways they might never do when asked directly.

Designer's Note

Game and toy designer Cynthia Woll, who has worked for Mattel Media (as well as Disney, Electronic Arts, and others), related a story about testing a new idea for a Barbie that could “talk” with the girls. It turned out that the girls had no interest in what Barbie had to say; they just wanted to use Barbie as a “talking stick” for themselves. They used Barbie to express their feelings and tell stories about their lives. The girls acted out their hopes, dreams, and aspirations through the medium of the doll. Cynthia saw that it was all about the story. Girls acting out stories is the predominant play pattern for the Barbie line of toys.⁴⁰

Kids are looking for opportunities to express themselves, and Make-Believe Play gives them the opportunity to do so. Pretending to be a tiger, hero, or ninja allows exploration of strength, ability, and power. Pretending to be a doctor, nurse, zoo-keeper, or mother allows exploration of nurturing. **Power Play** and **Nurture Play** patterns seem to be universal, and are great components to consider in product design. The main thing is that kids crave opportunities to become someone else and to tell a story through that character's eyes. Give them opportunities to do so, and remember these may be private explorations where insight comes from telling the story, not from the end result. Kids may or *may not* care about sharing these stories with others, at least until they reach the upper end of the “kids” age range, when their storytelling is considered art as much as personal play.

Properties of Play

To create engaging interactivity for children, designers need to have an awareness of what real play looks like so they know it when they see it. They also need a good understanding of the different patterns of play before they can build something that truly delights a child's spirit and ignites the imagination. True play is the magic that turns ordinary products into award-winners that kids will love and come back to.

Dr. Stuart Brown has identified and described the key properties of play. Brown's principles apply to interactive learning and game design because, to design for play, we first need to understand what the experience of play looks and feels like. Below are the key properties of play (as defined by Brown) followed by descriptions of how these properties are important to designing games and learning experiences for children.⁴¹

Apparently purposeless. “Play activities don't seem to have any survival value. . . . Play is done for its own sake. That's why some people think of it as a waste of time.”⁴²

Parents often don't understand a child's fascination with a game or toy; they only see the time “wasted playing games” without connecting to what the child gets from that play. In all gameplay, there is much more going on than is apparent in the minds of most adults. Games designed with more of an open-ended structure help facilitate a child's natural drive to find their own purpose for the play involved. This is when games become toys, and let the child follow their own imagination and curiosity.

*It should be noted that children at play are not playing about; their games should be seen as their most serious-minded activity.*⁴³

—Michel de Montaigne, philosopher

Voluntary. “[Play] is not obligatory or required by duty.”⁴⁴

We play because we want to, and because we are called to do so. This idea is paramount in terms of interactive design because kids vote with their attention. A program has to engage their interest so they don’t walk away. What value is an “educational” game that kids won’t play without coercion? The idea of play as a voluntary act can be frustratingly clear to designers when they first hand a tablet to a child to test a new app. After a few minutes, the child may just hit the home/escape button and be out of there. The designers may say, “Wait, wait, there is more to do,” but the child has already authentically given some great feedback.

*Play is, first and foremost, an expression of freedom. It is what one wants to do as opposed to what one is obliged to do.*⁴⁵

—Peter Gray, author and psychologist

Inherent attraction. “[Play is] fun. It makes you feel good. It provides psychological arousal (that’s how behavioral scientists say something is exciting). It is a cure for boredom.”⁴⁶

What is it that gets a child’s attention? What do they expect is going to happen? What do they want to see more of? Later chapters examine this more extensively, but asking yourself—and your kid users—these questions is very helpful in building content that meets a child’s needs, wants, desires, and expectations.

Freedom from time. “When we are fully engaged in play, we lose a sense of the passage of time.”⁴⁷

Play is how we learn something new. Children need the time and space for creative exploration. Learning is about making connections between things, and that kind of process takes time. When children are absorbed in play, they step out of “adult time” and into what is speaking to them at the moment. Children deeply engaged in play won’t notice time passing. As Einstein said, “An hour sitting with a pretty girl on a park bench passes like a minute; but a minute sitting on a hot stove seems like an hour.”⁴⁸

Unstructured play is so important to children that the American Academy of Pediatrics (AAP) states, “Free and unstructured play is healthy and—in fact—essential for helping children reach important social, emotional, and cognitive developmental milestones as well as helping them manage stress and become resilient.”⁴⁹

Diminished consciousness of self. “We stop worrying about whether we look good or awkward, smart or stupid. We stop thinking about the fact that we are thinking. . . . We are fully in the moment, in the zone.”⁵⁰

This is what psychologist Mihaly Csikszentmihalyi calls *flow*.⁵¹ When a child is in

this state of pure engagement, it's a sign of great design, and it's something to look for when testing prototypes with kids. When they become so engrossed in play that they forget anyone is watching, it's a magical moment to be appreciated. It is also an important interactive design element to understand. In an engrossed play state, kids will often imagine your design doing something you didn't imagine it doing, and that can lead to valuable design enhancements and new features.

Improvisational potential. “We are open to serendipity, to chance. We are willing to include seemingly irrelevant elements into our play. . . . The result is that we stumble upon new behaviors, thoughts, strategies, movements, or ways of being.”⁵²

Kids want to feel they have control, and it's important to give them opportunities to experiment, to do things “wrong,” to break the rules, and generally to muck-about inside a game. In design, it's an asset when you can allow for the recombining of elements, the making of a mess, or the solving of problems backwards or in surprising ways. Insight and creativity flow from seeing things from new perspectives. Play opens up the opportunity for unexpected things to happen.

Provides a continuation desire. “We desire to keep doing it, and the pleasure of the experience drives that desire. We find ways to keep it going. . . . And when it is over, we want to do it again.”⁵³

As the saying goes, “The journey is the reward.” When play meets all our needs for curiosity, challenge, and engagement, we can be disappointed when it's over. In fact, if something in the rules jeopardizes our enjoyment or signals an end to the fun, we invent new conditions to let us continue. Building in the potential for unexpected surprises and connections in a product allows children to, as Warren Buckleitner, Editor of *Children's Technology Review*, says, “Accidentally succeed.”⁵⁴ The freedom to experiment and the delight of responsive results feed curiosity, insight, and the desire for further explorative play.

*Children do a good job of looking as if they're wasting time, but secretly they are in the business of educating themselves about how the world works.*⁵⁵

—Tzvi Freeman, author and philosopher

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