

Getting the Most Out of Screen Time

The PBS KIDS Approach to Learning Through Media

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Abstract

This article provides an overview of the PBS KIDS production process and discusses how the network approaches the creation of educational media for children in this digital, multiplatform age. Multiple research studies show that children can benefit from high-quality video and digital games, especially when parents also engage with that media through co-viewing, co-play, or conversation. Based on this research, the article outlines PBS's recommendations for how parents and educators can best promote learning through media.

It's hard to remember, in today's age of always-on connected devices and thousands of media choices, that there was ever a time when there were very few media options for young children. At the advent of television, there were just a few programs truly created with the child audience in mind, and they were primarily designed to entertain rather than educate. In 1968 and 1969, two unique truly innovative programs premiered on the nation's first public television stations throughout the country. *Mister Rogers' Neighborhood* and *Sesame Street* were to become not only cultural milestones in the United States, watched by millions of children, they revolutionized the public's understanding of how television could be a positive influence in the lives of children. Those two programs predated the creation of PBS—the Public Broadcasting Service—but they had a significant impact on both its establishment and its approach to content development for children.

The creators of these programs, Fred Rogers and Joan Ganz Cooney, respectively, were visionaries who brought a child development perspective to media, recognizing that a television screen had incredible power to connect with and educate children. But their influence did not stop with television; they laid the groundwork for a research and

production process that could guide newer kinds of media and technology as they evolved. They recognized that children would not only learn from their shows, but then take those lessons and ideas into the world around them. They laid the foundation for generations of producers, storytellers, and game developers to educate using the forms of media available to children today.

Perhaps most important, they set a new bar for what "screen time" could achieve. In 2001, researchers interviewed 570 teens who had taken part in a summative research study about *Mister Rogers' Neighborhood* and *Sesame Street* when they were 5 years old. Commonly referred to as "the recontact study," the researchers found that teens who had watched these two shows as preschoolers had a number of positive outcomes, including better grades, more time spent reading, and less aggression (Anderson et al., 2001). The long-term positive impacts of programs like these prove that all screen time is not the same.

I joined PBS in 1999, as one half of the then two-person team dedicated to a PBS website for children (see Figure 1). Amazingly, Fred Rogers himself had an influence on this initiative within PBS; he wanted to bring his much-visited *Neighborhood* to the online space, recognizing the opportunity the Internet provided for children to actually interact with the characters and stories in his program. He also recognized that children were going to be using the Internet within their own lives, and they needed spaces that were designed specifically

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Figure 1. The PBS KIDS Website Today



with their abilities, interests, and social–emotional needs in mind.

One of the things I find so remarkable about Fred Rogers' approach is that he saw new media forms as additive, new opportunities to help children learn about the world around them. He was very clear that children need in-person conversations and hands-on experiences to grow and thrive, and he also recognized the possibilities for "active play" that came with new technology. In an interview with *Family Computing* in 1985, Fred Rogers said, "We have to help give children tools, building blocks for active play. And the computer is one of those building blocks. No computer will ever take the place of wooden toys or building blocks. But that doesn't mean they have to be mutually exclusive" (Wallace, 1985, p. 32).

This is the approach my colleagues and I at PBS KIDS still take to the creation of media, regardless of the platform and technology being used. We believe in the power of media to educate, inspire, and inform young children. Our approach has also evolved: We know that media itself has the power to inspire conversations and interactions with the grown-ups in children's lives. And we believe that media can provide a jumping-off point for real world explorations and learning.

In this article, I will provide a high-level overview of the PBS KIDS production process and explain our approach to creating educational media for children. Next, I will share research findings about how children can benefit from high-quality media. Finally, I will outline our recommendations, based on this research, for how parents and educators can best promote learning through media.

PBS Is Not a Typical "Network"

One thing to keep in mind is that PBS is not like other networks within the US. PBS receives some government funding

(less than 10% of its operating budget comes from taxpayer dollars), but the majority of funding comes from outside grants, sponsorship, and donations from viewers. Even more unusual is that PBS is owned by its member stations. These stations are critical to the public television mission; not only do they decide how and when to broadcast PBS KIDS shows, they bring content and resources into local neighborhoods through hands-on and targeted programs that extend the educational goals of the programming in partnership with local schools, libraries, and community centers. PBS stations reach more children, and more moms of young children, than any of the children's TV networks (Source: Nielsen 19–20 TV season.)

As Linda Simensky, head of PBS KIDS content has described,

PBS is a distributor of content, working on behalf of stations across the US. It is not designed to operate the way a cable channel does, where the channel finds, purchases and fully owns properties before producing them. Rather, PBS acts as a commissioner and American distributor, finding properties of interest, working with the creators and producers on developing the ideas, and then commissioning the series, partially funding them, and overseeing the production. (DeWitt & Simensky, 2019, p. 17)

PBS KIDS works with an amazing group of producers, who are key partners to achieving PBS KIDS' mission of educating and engaging children through media. I want to emphasize a point in the quote above; these producers retain control of their own properties and hold the creative vision of their shows. Keeping a centralized creative vision is a key part of the PBS KIDS' transmedia strategy: making sure that a program's characters, storylines, and educational goals are consistent and clear regardless of where a child might encounter those characters and stories, through games or video, and on any platform.

The PBS KIDS Educational Approach to Production

As early as the pitch process, the PBS KIDS team asks for proposals that consider multiple ways a child might encounter those characters or storylines:

- what kids watch on screen (long- and short-form narrative video)
- what kids play on screen (digital games on desktop, tablet, or connected TV device)
- how parents/caregivers can engage in the content with kids (co-play in digital games, offline play, activities, conversations)
- how kids could experience the characters in formal and informal educational settings (e.g., digital games, digital activities and simulations, offline play, hands-on activities, conversations and discussions).

Considering all of these scenarios at once helps the team achieve consistency across all platforms, but it also helps us make sure that the educational goals are so closely tied into the show's structure that learning can take place wherever the child encounters those characters and stories.

With that in mind, all PBS KIDS production is built on a series of Learning Frameworks. These frameworks are developed in concert with child development and subject matter experts and cross all areas of curriculum our advisors believe are critical to early school readiness, including science, technology, engineering and mathematics (STEM), literacy, social-emotional learning and executive function, fine arts and creativity, social studies and community, and health, among other areas. The frameworks were developed to focus on what children 2–8 years old most need in each skill area at each age, and they are designed to consider how media, specifically, can best address those needs. When producers begin developing a property for PBS KIDS, they use their framework as a guide for development of storylines, digital games, and outreach experiences for their shows.

Throughout the production process on every platform, PBS KIDS producers are encouraged to work with academic and child development advisors to review and comment on the content. PBS KIDS also brings in subject matter experts when we are approaching new curriculum areas across multiple programs, or when we are exploring whether a specific skill area can be addressed through gameplay. While this process can be lengthier and bring many voices into the mix, we believe that it still helps best achieve our goals for crafting high-quality media that really can help children learn.

One of my primary areas of expertise within PBS KIDS is gameplay. The PBS KIDS approach to digital game development differs from most commercial networks in that games are not developed as show promotional vehicles, or as advertising tools. Games for our series offer us an opportunity to introduce, reinforce, and extend the curriculum goals of each



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Fred Rogers wanted to bring his much-visited Neighborhood to the online space, recognizing the opportunity the Internet provided for children to actually interact with the characters and stories in his program.

series in new ways. Gameplay plays a particularly exciting role, because children can interact with the characters, respond to questions, and really try out the concepts they have learned about on television.

Games also allow us to experiment with different technologies and test out their potential for helping children learn through digital play. For example, the program *Wild Kratts* focuses on helping children identify and understand features of specific animals. In partnership with the Kratt Brothers, we experimented with laptop cameras, wondering if they could capture a child's movements while pretending to be an animal. In this game, *Going Batty*, children used their bodies to control a bat on screen: they waved their arms to imitate how a bat would flap its wings, dodged their bodies back and forth to mimic how bats would capture mosquitos, and curled in their arms to demonstrate how a bat might sleep. In testing, children loved flying along with the bats, and easily recounted the lessons they learned about a bat's movements. My favorite part? After the screen was turned off, the children kept pretending to be bats! They flapped and dodged their way out of the testing room.

Technology and Young Children

Another key component of the PBS KIDS production approach is to put kids in the driver's seat. We work with our producers to create experiences that even young children can navigate with little or no assistance, eschewing lengthy pieces of text that could be a barrier to pre-readers, and designing interfaces that require little or no formal instructions. Not only do we want children to encounter the learning goals on their own, giving kids their own agency within a safe, contained experience helps them become more comfortable and fluent with technology. Many of our games are also built to respond to the child's level of understanding, self-leveling in response to the child's early interactions with the game, or actually adapting to the child's level of proficiency with the material and game mechanics.

To make sure that we are accurately reflecting the needs and abilities of our audience, games on PBS KIDS are taken into playtesting sessions multiple times during the production process. Playtesting takes place in preschools and elementary school classrooms that represent the diverse populations of children that access our content. In recent months, our testing has taken place over video conferencing services so that we can reach children at home during the COVID-19 pandemic. Our team members then observe children's body language, comments, and statements throughout gameplay, and they note how easily children can successfully complete game challenges.

As I wrote in 2019, "Open-ended questions can lead to interesting insights that aren't visible in gameplay data. For example, in playtesting sessions for games introducing the scientific inquiry process, the facilitators noted whenever children verbalized the inquiry process:

- "I got an idea!"
- "How is this gonna work?"
- "I think it's going to do this... (pointing to items on the screen) And then this... And then that and then BOOM!"

Playtesting is a critical step for recognizing which gameplay mechanics may be too easy or too difficult for a child, whether the game has adequate instructional language and prompts, and how successful the overall game concept will be" (DeWitt & Simensky, 2019).

PBS KIDS' mission is to be a safe and educational space for all children, and that directive carries to our distribution

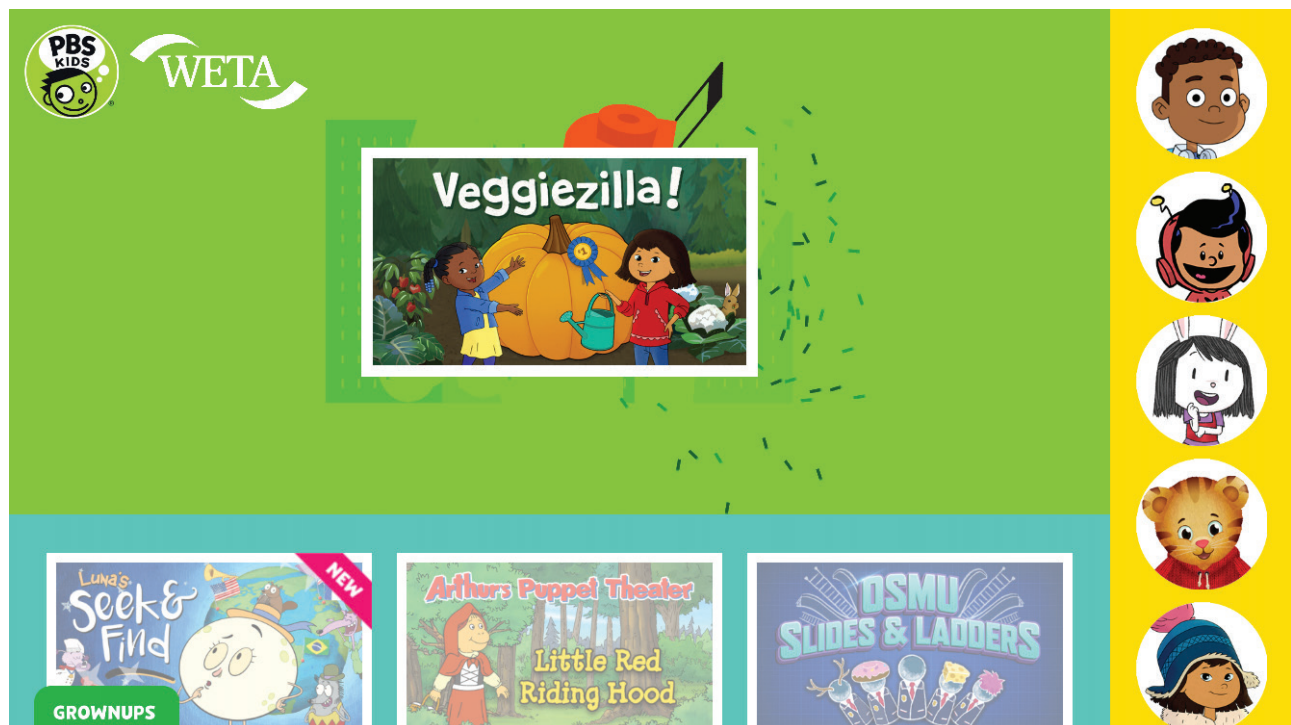
approach, as well. It's easy to be focused on the latest and greatest technologies, but those aren't always the platforms that can reach the most kids. Children in all homes in the U.S. are more likely to use cheaper or older devices for their own gameplay. In lower income homes, children are less likely to have consistent broadband access and more likely to be using lower-end tablets or phones when they have a chance to play games or watch media.

These restrictions are very much top of mind when the PBS KIDS team thinks about production of new games and activities. Our "test bed"—the list of operating systems and device types we use for quality assurance testing—is extremely long and includes many devices that other major media companies ignore. Our purpose in this is to reach as broad and diverse an audience as possible with our content. Currently, PBS KIDS averages 13.6 million monthly users across digital platforms (Source: Google Analytics).

We also have created multiple products designed specifically for use without consistent access to broadband. The PBS KIDS Games App (see Figure 2) has more than 200 games; a few will download when a family first installs the app, but children can then choose which games to download and play. When a child is out of Wi-fi access, they can play all of the games already downloaded. The next time they have access, they can then swap out these games for others. Parents can also change the storage settings of the app so that the Games app doesn't take up too much space on the device.

We know that it is important for children to experience a variety of activities and experiences throughout any day, especially

Figure 2. The PBS KIDS Games App



ones that involve interactions with grown-ups, and real-world play with their hands and bodies moving. Many digital experiences for children use persuasive design: approaches to digital content creation designed to keep the audience playing or scrolling through media for very long periods of time. This is not PBS KIDS' goal; while our media is designed for free play and exploration, we also strive to give children natural break points, whether through a finite end of a game level or breaks to announce success or skill mastery.

Regardless, it is often hard for young children to turn off media when they are excited by it and enjoying the experience. This is part of the reason why PBS KIDS focuses on the role that grown-ups play in children's lives—parents, educators, babysitters—and the context they need to help navigate the many media options available to children.

The PBS KIDS Learning Ecosystem: How Grown-ups Support Learning Through Media

One thing that is clear in our many surveys and social media conversations with parents is that parents are overwhelmed by the amount of digital content available for their children. They aren't sure what really is or is not educational, what is safe for children at different ages, or how to determine how much time with devices is OK. In the COVID-19 pandemic, parents and caregivers are turning to even more media content to keep their children entertained at home, but still struggle with which media to choose and how much is too much.

One thing we do know is that children can learn from high-quality, educational media. This has been proven again and again through studies of shows like *Sesame Street* (Kearney & Levine, 2019), *Super Why* (Linebarger, 2015), and *Odd Squad* (Tiu et al., 2015). We also know that children can learn from playing thoughtfully designed, curriculum-driven games, such as *The Cat in the Hat Knows a Lot About That* apps and games (Grindal et al., 2019) and the PBS KIDS for Parents *Play & Learn Science* app (Christensen et al., 2019). Librarians, school media specialists, and organizations such as Common Sense Media and the American Library Association can provide excellent guidance for parents seeking age-appropriate and educational media choices for their children.

Beyond decision-making on the front end, another important thing for parents and educators to understand is that watching, playing, and engaging with children around educational media can help them learn more from that media. In 2016, Texas Tech University conducted a study of the program *Daniel Tiger's Neighborhood*. After children watched episodes of the show for 2 weeks, researchers interviewed them and played games to measure social-emotional skills:

Kids in the study who watched Daniel Tiger's Neighborhood had higher levels of empathy, were better at recognizing emotions, and were more confident in social situations than the kids who watched the nature show. This is especially true for low-income children and kids ages 4 and younger.



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The catch? Kids experienced the above benefits only when their parents regularly talk with them about what's on TV. In other words, the study found that it was the combination of watching Daniel Tiger's Neighborhood and parent-child conversations about TV that produced increases in children's social skills. Neither watching the show alone, nor talking alone, was enough. It takes both. (Rasmussen, 2016).

The great news is that parents and educators can engage with children through educational media in a few different ways, and that educational gains are possible with different levels of effort.

Co-Viewing and Co-Play

The first and most regularly cited recommendation is co-viewing or co-play with media. Co-viewing is the act of sitting down with a child to watch or play media together. Dr. Eric Rasmussen from Texas Tech explained it this way: "Watching TV with your child communicates that what your child wants to do is important to you and that you approve of the content they're watching. This not only creates a bonding moment, but also inspires your child to pay closer attention to the lessons within the show. Your presence alone is enough for your child to learn better." (DeWitt, 2017)

In the case of gameplay, children love to show parents what they can do, and demonstrate their mastery of an experience. Playing together (or actively watching while a child plays) gives the child a chance to show what they can do, and allows the parent to observe how their child solves problems or tackles the frustration that comes with navigating a challenge. In a 2015 study of PBS KIDS math games and media, researchers determined that after engaging with their children as they watched and played *Peg + Cat* math games, parents and caregivers reported significant increases in their confidence to support math learning for their children. These parents were then more likely to engage in problem-solving strategies with their children at the close of the study (Pasnik et al., 2015). The

experience of playing together gave parents the context and vocabulary to better engage in their children's math learning.

Just like with books, talking to a child while watching or playing is beneficial and can help spark conversations with the child. Researchers recommend asking questions about games or shows such as "What do you think Daniel should do now?" or "How are you going to solve this level of the game?" Although these questions are very simple, they can have a profound effect on learning. Earlier this year, I interviewed Dr. Jenny Radesky (DeWitt, 2020), a professor at University of Michigan who has led the writing of media-related statements from the American Academy of Pediatrics. She explained that young children "can learn facts such as letters, vocabulary, and math concepts from the preschool years and older" just by watching a show. However, "they need adults to help them connect these facts to larger concepts, contextualize their learning and apply it to the world around them."

Asynchronous Engagement

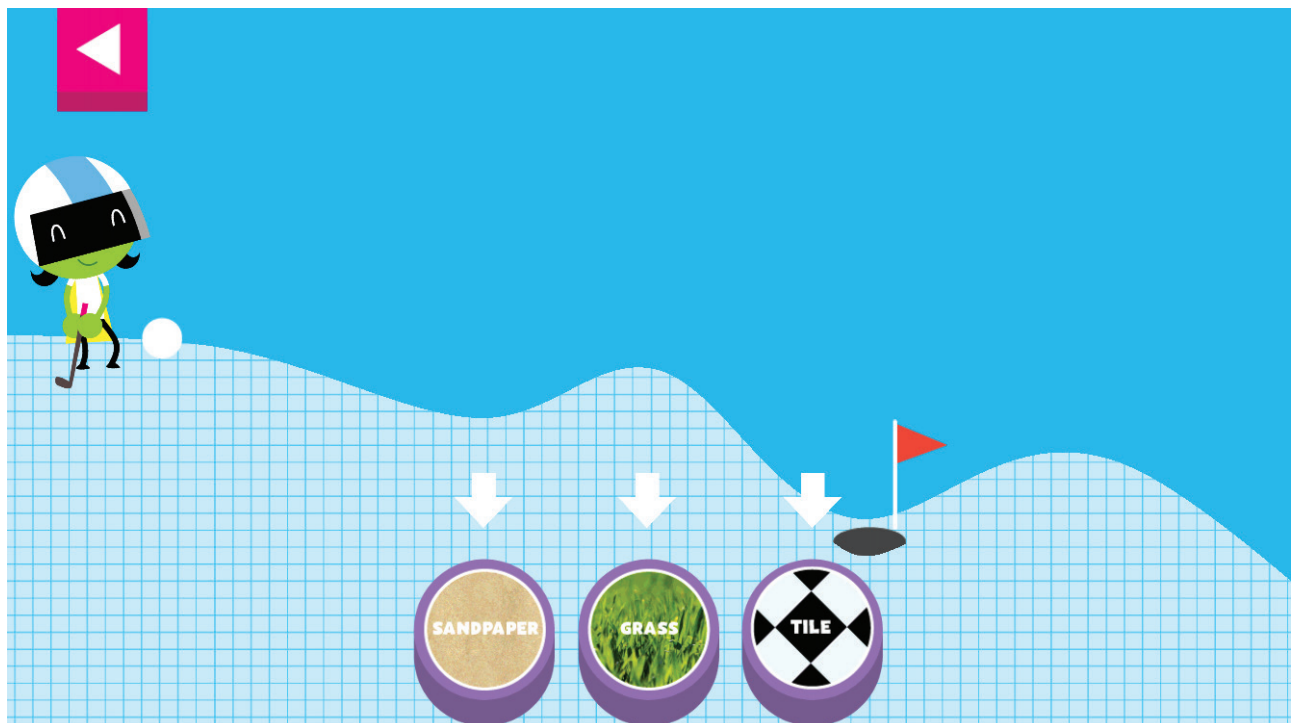
Engaging in media together is fun and can be a de-stressor for parents and kids alike, but it's not always possible for families, especially given the stressors of balancing work and child care. It's important to understand that conversations after a child watches a show or plays a game can also have educational benefits. Finding time later—such as on a car ride or at a mealtime—to ask basic questions about what the child watched can help reinforce the lessons that were presented within the show. Asking a child to tell the story of a program or game can also be a great early literacy activity, recounting

the beginning, middle, and end, or "What came next?" It also can be a great prompt for considering another's perspective: "Wow, what would you do if you were in that situation?" These conversations not only reinforce the educational lessons of the show, they help children build critical thinking skills ("What would make this game better?"), and can set up a great habit for media within the family: Media is something to talk about and can spark interesting conversations.

Beyond conversation, media can also be a great jumping off point for parents and children to play together away from screens. Many PBS KIDS games and storylines are developed considering how a child might model those lessons and examples in the real world. For example, in the *Nature Cat* show and in the *Nature Cat Outdoor Explorer* app, the characters model making observations about the nature in their own neighborhoods, concepts intentionally designed so that children can practice them on their own.

The PBS KIDS Play & Learn apps are specifically designed to encourage real-world play after digital play. Each game has associated tips and activity ideas for parents to extend the learning goals. For example, in Play & Learn Science (see Figure 3), children test how quickly a ball can roll across different surfaces, such as brick, grass, or sand. The app then encourages parents to experiment rolling a real ball across different surfaces at home and outside, asking the child to predict how fast or slow it might go, or try out what happens when they can roll it down a ramp or through a tube. The app, which won the American Library Association's inaugural Excellence in Early Learning Digital Media Award,

Figure 3. PBS KIDS Play & Learn Science



gives parents ideas and vocabulary to engage in more engineering concepts with their children throughout everyday experiences.

All PBS KIDS producers develop extensive materials for parents and educators related to each program. For parents, content includes hands-on play activities related to the series goals, in-depth articles about different learning areas and how to explore them at home, and tips and suggestions for conversations and play after watching PBS KIDS shows. The PBS KIDS for Parents site allows parents to search for activity ideas related to all PBS KIDS shows. The activities are searchable by topic and skill, age target, and type.

Our producers also create content with classroom needs in mind, including activities for larger groups, videos and games aligned to state and national learning standards, and lesson plans. PBS and producers also support teachers' professional development through our content, with articles, videos, and courses about how to effectively incorporate technology and media into early childhood classrooms. PBS KIDS tools for educators are distributed through PBS LearningMedia.

Conclusion

One of my favorite stories about Fred Rogers is that he decided to work in television because he didn't like what he was seeing on this new technology. As he was quoted in the Washington Post in 2001 (Gillies),

I saw a program on television with people throwing pies in each other's faces. I thought [television] has the possibility of being in lots of homes and could be used for much better service. So I decided to try my hand in television.

As he and many talented producers have proved, media for children can, indeed, be used for positive service. PBS KIDS has been distributing educational content in partnership with fantastic producers for 50 years, regularly updating and refining our models to best meet the needs of children, respond to research best practices, and be available on the platforms and technologies most used by families today. Our goal is not to dominate the children's media landscape, but to nudge the whole industry to create more meaningful, positive, and educational experiences for young children and their families.

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PBS KIDS Video app

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The Cat in the Hat Builds That app

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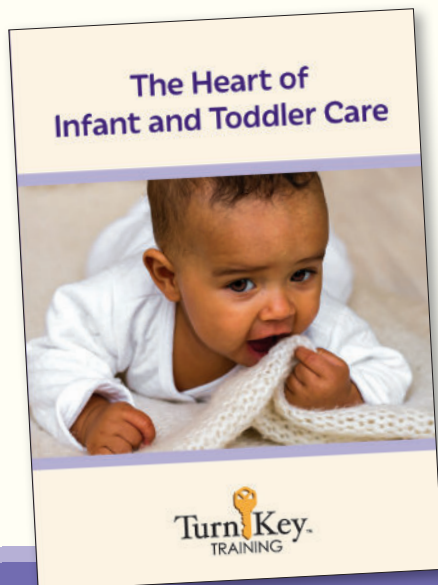
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