

# SCREEN SENSE



## EXECUTIVE SUMMARY



**Screen Sense**—developed in partnership with leading researchers in the field of media and young children—describes what is known at this time about the effect of screen media on young children’s learning and development. We hope this executive summary, with the help of the **Screen Sense** [parent resources](#), will serve as a useful tool in guiding parents and professionals in making mindful, informed decisions about screen media use with children from zero to 3. If caregiving adults choose to make screen media a part of children’s lives, they can apply the research such that screen experiences harness, not harm, the potential for young children’s learning and development.

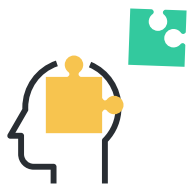


This executive summary covers key topics related to children's early learning and screen experiences, including:

- [Why very young children sometimes struggle to learn from screen media \(the “transfer deficit”\)](#)
- [The influence of parent screen use on children’s learning \(“technoference”\)](#)
- [Key ingredients to consider when making media decisions for children \(The “3 C’s”\):](#)
  - The Content
  - The Context
  - The Child
- [Key components of screen media content that support early learning \(the “E-AIMS”\), meaning content that is...](#)
  - Engaging;
  - Actively Involves the child;
  - Meaningful; and
  - Socially Interactive.

To read the **Screen Sense** report in its entirety, [click here](#). There are also a range of [additional resources](#) that are available for parents and professionals that highlight key findings from the report.

## Screens Under Three: Why young children struggle to learn from screen media



Every day, young children are learning about their world from a variety of sources. They then apply what they have learned to their day-to-day experiences. Consider a 2-year-old who reads a book about going to the doctor with her parent and is especially interested in a page where a nurse explains, “This shot will help you stay healthy.” A few days later this toddler holds a toy syringe up to her doll’s arm while saying, “Get a shot!” This is called **transfer of learning**, or the application of information from a 2-D object (in this case, a book) to a 3-D object (the actual toy). Transfer of learning is critical because it means that the child can apply knowledge to her real-world experiences.

### The Transfer Deficit

Children do learn from TV and interactive tablets, starting very early. Research shows that babies as young as 6 months old can imitate simple actions they see on TV, immediately afterward and even up to 24 hours later; and by 18 months, toddlers can remember brief sequences that they saw on TV or in a book for 2 weeks. By 2 years old, they can remember these sequences for 1 month.

Researchers who study how children learn have found, however, that it is easier for young children to learn from real-life interactions with people and objects, compared with information delivered via a screen. Researchers call this finding the “transfer deficit.” For example, studies show that, for children 12, 15, and 18 months

old, the ability to imitate a multi-step sequence from TV lags behind their ability to learn from a live demonstration of the same action. Similarly, when 2-year-old children are told via a pre-recorded video where to find an attractive toy hidden in the room, they are typically unable to locate the toy, even though children are perfectly capable of doing so when given the same information in person. This finding has been found again and again, across many types of tasks, demonstrating the broad impact of this **transfer deficit** from video content on young children. This transfer deficit impacts children in different ways at different ages, showing that a child’s development influences his readiness to learn from a screen experience and apply that information to the world around him.



## TAKEAWAYS

### Supporting the needs of very young children

- **Limit media time to ensure lots of time for interactive play in the real, 3-D world** because young children learn more quickly and efficiently through interactions that take place during exploration of their environment with parents, caregivers/teachers, and peers.<sup>38</sup>
- **Be cautious about the amount of learning to expect** a young child can derive from a screen experience on its own.
- **Look for ways to extend learning experiences from the screen to real-life.** For example, if the child is playing a tablet-based interactive game about color matching then afterward, parents and children can color together with crayons or sidewalk chalk and talk about the color names in “real life.”
- **Use the E-AIMS to maximize children’s learning from screens.** There is growing research that well-designed, high-quality children’s media, experienced with parents, can reduce the transfer deficit and support children’s learning.

## Technoference

“Technoference” is defined as everyday interruptions to interpersonal interactions or time spent together that occur due to digital and mobile technology devices. Early childhood may be a particularly vulnerable time for technoference, as young children expect (and need) a great deal of social interaction from others.



What about when parents use their own personal devices, like smartphones and tablets, when they are with their young children? Researchers at Boston Medical Center conducted an observational study of 55 parents and their young children eating at fast-food restaurants. They reported that 40 of the 55 parents used a mobile device during the meal. Furthermore, the researchers found that the more time that parents interacted with mobile devices, the more likely their children were to act out, apparently trying to get the parents' attention, which often led to angry reactions by the parents, including shouting and, in one case, kicking a child's foot.

Although the study had some weaknesses, it suggests that many parents may be missing

valuable opportunities for positive social interaction with their children when using their mobile devices, and that parental absorption in their mobile devices can result in increased negative child behaviors.

Could interruptions from texts or calls also interrupt language learning? Researchers asked mothers to teach their 2-year-olds two novel words. Mothers received a call that interrupted them while teaching one of the words, but not the other word. Children were significantly more likely to learn the uninterrupted word than the interrupted word. This finding remained despite the child hearing the novel word the same number of times in both conditions.

Parents are often not aware of their own media usage or that it can interrupt an ongoing activity with their child. Children, too, are distracted by media interruptions and don't play or interact with parents as much when they occur. Being mindful of their own media use allows parents to make informed decisions about screens that support their child's early learning and the relationship they share.



## TAKEAWAYS

### Reducing Technoference

- **Be mindful about mobile device use throughout the day.**
  - Consider whether it is possible to set aside times when you don't have to multitask between your child and demands/notifications from devices. The “do not disturb” or silent setting on your phone can be useful during one-on-one time.
- **Avoid background media.**
  - Turn off the television when children are playing and during daily routines like mealtime.
  - Turn the TV off when no one is watching.
  - Reserve time to watch adult-directed TV when children are not present.
- **Use daily routines (mealtime, bath time, bedtime, diapering) as opportunities to connect with children** through conversation and playful serve-and-return interaction.

## Key Ingredients to Consider When Making Media Decisions for Children

When choosing media for young children, considering the 3 C's (child, content, and context)<sup>6</sup> can provide insight into what media experiences are most appropriate for an individual child. Parents and other caregiving adults can:

### CHILD

Think about your specific **child**, including details like her age, specific interests, attention span, and even her current mood. Does this media exposure seem right for your unique child, right now?

### CONTENT

Consider the media **content**. Does it engage your child in meaningful and active ways? Are the themes and topics that are introduced age-appropriate and acceptable to the family? Is the content relevant to the child's real life?

### CONTEXT

Consider the **context** in which your child is learning: For example, is the child alone or sitting with an adult when watching or playing something on screen? Young children learn more when an adult is with them to respond to questions and help them understand and apply what they are seeing and experiencing on screen.

*Adults can use the 3 C's, along with the E-AIMS guidelines below, to judge the value of using different media to support young children's learning.*

## Key Components to Support Early Learning From Screens

In 2015, scientists summarized decades of work from the Science of Learning into four guidelines describing how children learn best, which they called "The Four Pillars of Learning." These four pillars can be used by parents, teachers, and other adults to help identify high quality children's media. They can be easily remembered by the acronym E-AIMS: Content that is Engaging, Actively Involves the child, is Meaningful, and Social.



### Engaging

Children learn best when they are **engaged** with the material and undistracted by features that are unrelated to the main content. The engaging features should have a purpose: to focus the child's attention on a consistent learning goal.

An example of appropriate engagement can be found in emerging research on the ways in which e-books can be most—and least—supportive of early development. Getting the balance of interactivity right is crucial. Both children and parents can be distracted from the storyline by clicking different hotspots (interactive areas on the screen). One study showed that when using early versions of e-readers, parents tended to focus more on the technology and less on the story, guiding their children to click on e-readers' different features, such as touching a picture to make a sound. This type of interaction resulted in children recalling very little about what was read, reducing their story comprehension. But when adults read well-designed e-books and traditional books to children, comprehension was equivalent

across book types. The authors propose that e-books should be designed without irrelevant hotspots or distractors, in such a way as to engage the reader and enhance comprehension.

### Actively Involved

Learning is supported when children are **actively involved** in the educational content. The key here is that content should be "**minds-on**," i.e., the child is mentally active, putting mental effort into participating in the content. Research shows that the more active children are as they engage with screen media, the greater their learning. When preschoolers actively attend for longer periods of time to educational programming, they learn more from it. Indeed, programs like *Dora the Explorer* and *Blue's Clues*, in which characters speak directly to the child and pause for the child's reply—actively eliciting their participation—have been found to encourage expressive language production and vocabulary.





To study younger children, researchers sometimes use an “object retrieval task” to explore the question of whether children can learn from screens. Imagine an experimenter hides an object, like a sticker, from view while 2-year-olds watch on video or on a tablet. The children are then asked to search for the object on another screen or with real props that are identical to those used in the video. In general, the research shows that the more interactive the touchscreen experience is, the more successful children are at finding the hidden item when they transfer from the tablet to real props.



### **Meaningful**

Children learn best when new concepts are embedded in **MEANINGFUL** experiences and settings that children can relate to. Meaningful content is all about making connections: Content should be integrated in a context that is relevant to children’s lives, linking new information to what is already familiar.

**Embedding learning into stories.** Video content can be made meaningful by incorporating learning into an engaging storyline, which makes it easier for children under 3 to learn. Content creators can also provide accompanying resources for families and schools that guide adults in making connections between the content, the learning goal, and parent-child activities. For example, the PBS Ready to Learn initiative provides content and activities for parents and teachers across multiple media platforms to help families support children’s learning from the *Peg + Cat* program. When studied, this interconnected, scaffolded learning approach led to enhanced math knowledge, understanding, and ability among the preschoolers who were tested.

**Familiar characters.** Another way to scaffold learning in screen media is to use characters that are well-known and meaningful to young children. Toddlers learn more from screens when the person or character on screen is familiar and loved (like a friend, relative, or beloved TV character like Elmo). For example, in one study, children saw either a known character (Elmo) or an unknown character (but that was popular in another country) demonstrate an early math concept. Two-year-olds learned the math concept better from the known character, overcoming a transfer deficit that was observed with the unknown character.

**Repetition.** Young children love to view the same video episode or to read the same

book over and over. And this repetition helps support their learning: For example, repetition of screen experiences can act as a temporary support that helps children learn from screen media, and it has been shown to reduce the transfer deficit. Research shows that repeated exposure to specific actions in videos leads to greater imitation and learning in children 1 to 5 years old. The same pattern is seen with repetition of paper books.

### **Social**

Children learn best when the learning is part of a warm **social** interaction. This can take many forms, including media content that mimics social interaction or encourages high-quality interactions between children and other people in their own environment. A growing body of evidence shows that learning from TV, touchscreens, and video chat can be enhanced when parents participate with their children to create a social, interactive experience.



With today’s technologies, parent participation means going beyond just co-**viewing** with children. Joint media engagement (JME) describes the actions adults and children take when interacting with media and one another, while using traditional, mobile, and digital devices. JME involves serve-and-return interactions between adult and child and may involve: asking questions; labeling objects; providing descriptions of what is on the screen; and/or talking about or performing actions related to the storyline. These back-and-forth, responsive interactions have long been a hallmark of high-quality interaction for very young children. JME between young children and adults can help children make sense of a particular screen media experience and transfer learning beyond the screen.

**Television.** When parents engage their babies in verbal interaction while watching age-appropriate, educational programming together, there is a positive effect on children’s language development. In fact, one study of low-income, immigrant mothers and their infants showed that this kind of language-rich interaction around media use can reduce the negative impact media has been shown to have on language development. In another study, toddlers learned a word from video only when a parent provided verbal scaffolding, or tailored support provided to the child during the learning process.

**Tablets.** While only 25% of parents report co-engaging with their children during tablet use, one study found that high-quality parent JME (like parents' simple explanations, attempts to organize the task for the baby, and praise) increased 15-month-old infants' ability to transfer learning from the touch-screen to an object in the physical world.

**Video Chat.** Social interaction is also a key feature of video chat. When young children engage in video chat interactions with family

members or friends, they are less impacted by the "transfer deficit," probably because video chat retains the back-and-forth nature of in-person social interaction. In one study, toddlers between 24 and 30 months of age were able to learn new verbs via video chat as well as they did in traditional face-to-face interactions. In another study, babies and toddlers aged 12 to 25 months old learned novel words, actions, and patterns from adults more effectively in video chat versus pre-recorded videos.



## TAKEAWAYS

### **Ensuring Media Experiences Embody the E-AIMS Pillars of Learning (Engaging, Actively Involved, Meaningful, and Social)**

- **Choose content (TV, apps, e-books) carefully.** Be sure that content is appropriate for the child's age and that it reflects the child's experiences in the real world.
  - **Look for content that both actively involves children while also helping them stay focused.** Features that give children control over their experience can help keep children in minds-on mode.
  - **Look for content with familiar settings, strong storylines, and characters that your child can relate to.** These features focus children's engagement on the learning goal. Avoid content with many "bells and whistles" that may distract children from the educational content or from understanding the story.
  - **Use repetition wisely.** Repetition can be useful when the content is well chosen. Just as children like to choose the same book many times, they also enjoy viewing other media content repeatedly. When interacting with media on repeated occasions, adults can point out different aspects of the touchscreen activity or TV show. For example, if the show is focused on counting fruits, focus on naming and describing the fruits during one viewing and on counting the next time you watch. Be cautious of auto-play options on streaming services.
  - **Look for content that encourages social interaction.** This can take many forms, like programs or apps that encourage children's interactions with people in their own home.
  - **Seek out high-quality media content for children.** Public television stations and media outlets (e.g., PBSkids.org or Sesame Workshop) can be trusted to provide quality content that is both meaningful and engaging. These outlets utilize curriculum advisors with child development expertise when developing media content. Websites like commonsensemedia.org also provide suggestions for quality media content at various ages that is both meaningful and engaging.
  - **Check your local library to access quality content.** Many libraries are experimenting with free "check-out" systems for e-books, video content and paper books. Another free source is the International Children's Digital Library: <http://en.childrenslibrary.org>.
- **Make media more meaningful.**
  - **Help children make the connection between what they see on a screen and the real world.** If a game allows your child to move a ball by dragging their finger across the screen, play games afterward that involve rolling, throwing, and bouncing different balls. Point out and label objects in real life that children have seen on TV or touchscreens, such as animals and flowers. Or, parents might use color names (that the child practiced in a game-based app) to describe the family's clothes as they sort laundry together.
  - **Connect media experiences to daily routines.** If an app involves counting, incorporate counting into your everyday routines, like counting napkins together as your child helps set the table or counting the steps to the car.

- **Use JME to support learning.** Remember that joint media engagement (JME) enhances learning from television, tablets, e-books, and video chat.
  - **When children are watching TV, playing an app on a tablet, video chatting, or sharing an e-book, make it a language-rich, socially interactive experience.** As with paper picture books, adults can gauge the child’s level of understanding by providing prompts and scaffolding the screen media experience. Parents can help children make meaningful connections in their learning by: asking questions; labeling and providing descriptions of what they are seeing; and talking about the storyline.
  - **Be responsive, warm, and engaged** with your child during video chat, e-book reading, games on apps, and television viewing to support a more active, social learning context.
  - **Focus on the story when sharing e-books with children to provide a more actively involved, meaningful experience.** Talk to your child about the story. Ask children about what they think will happen next in the story; help them connect what they are seeing in the story to their real-life experiences.
  - **Be creative during video chat.** Consider using creative play opportunities that will engage children in rich social interactions—including play activities (e.g. playing with puppets or stuffed animals, playing peek-a-boo), simulated physical interactions through the screen (e.g. playing hide-and-seek, dancing to music, sharing a snack through the screen), and other activities the child and remote loved one enjoy doing when they’re together (e.g., reading a favorite book).

## Conclusion

The potential for rich learning opportunities can be maximized when adults—parents, caregivers, and teachers—first focus on the **child** and what media experiences best align with her current interests, abilities, and emerging skills. Next, adults should consider the **content** of media. This means selecting screen media experiences that are age-appropriate and educational in nature, and unfold within settings that are meaningful and familiar to the child. Ideally, these media experiences also offer opportunities for the child’s engagement, active involvement, and social interaction. Finally, adults should consider the **context** of the media experience—and whenever possible, seek to engage in the experience with their child, asking questions, providing descriptions, and making connections from the screen content to the child’s daily life. In this way, adults take the role of thoughtful guides, assisting young children in harnessing the potential of media for learning and shared enjoyment.



To learn more, browse our entire suite of [Screen Sense](#) resources.

For a full list of references, please see the [Screen Sense](#) literature review.