

**The “T” in STEAM:
Research on the Go Podcast**

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Announcer: Welcome to Head Start Talks, where big ideas support your everyday experiences.

Amelia Bachleda: Hello, and welcome to Research on the Go, a podcast where we explore some of the latest research in the field of child development, its implications, and practical applications.

My name is Amelia Bachleda, and today I'm joined by Marley Jarvis.

Welcome, Marley.

Marley Jarvis: Hi! Thanks for having me.

So, Amelia and I are both from the National Center on Early Childhood Development, Teaching, and Learning, and we're based at I-LABS – the Institute for Learning and Brain Sciences at the University of Washington in Seattle.

Amelia: In this podcast, it's our hope that we not only have the opportunity to talk about the research itself, which we love, but also talk about ways to incorporate it into your work supporting programs and grantees.

Marley: And today we're going to be paying particular attention to how babies engage with that "T" in STEAM for Technology.

Amelia: Okay, the first thing when I think about babies is not technology, and I'm not even sure where I'd start with that.

So, Marley, what does technology look like for infants and toddlers? Can you help us understand where to start?

Marley: Yeah, it's a really great question and an important place to start.

So, technology, which involves designing and using tools to solve problems, doesn't just mean cellphones and computers.

Technology encompasses other man-made objects like wheels, levers, scissors, even spoons. So, spoons are a tool that humans created to help get liquidy foods into our mouths, for example.

Amelia: And every time I have some soup, I am so thankful for my spoon.

[Laughter]

Marley: It's a good tool.

Amelia: So, what are children learning when they use these tools? What are children learning when they use a spoon?

Marley: Yeah, so when children play with technology or play with tools like this, like a spoon, one of the things they learn is about cause and effect.

Amelia: Mmm.

Marley: Think about, for example, a baby that maybe has learned that a chair, like your office chair that has wheels, is a great thing to use to support them as they move around, but the dining room chair, some other chair that doesn't have wheels, is harder to push.

So, the child might discover that when they push a chair with wheels, the effect is that it moves. So, they can cause that chair with wheels to move around and that those wheels might make it a lot easier for them to push that chair than a chair that doesn't have wheels.

Amelia: Yeah, you got it.

And understanding cause and effect is an important aspect of child development that helps children understand, interpret, and predict outcomes in the world around them. And, consequently, understanding cause and effect, it's an indicator of development in not only the Scientific Reasoning domain of the ELOF, but also the Perceptual Motor and Physical Development and Literacy domain.

So, how can adults support others in understanding what technology really means for infants and toddlers, particularly if we have to kind of work against that idea that all technology means is a cellphone, a tablet, or a computer?

Marley: Yeah, sometimes all it takes is a quick conversation, just kind of getting folks on the same page. So, helping people understand that any sort of tool that humans have created is technology of sorts. A great activity to get adults out of their heads a little bit and thinking about technology beyond just cellphones and computers is give adults a group of objects that a baby might interact with.

These objects can be anything – maybe a blanket, a ball, a cup, a spoon – like we had talked about – and then ask the adult to think about how babies might use these objects in creative ways to solve problems. So, not just how the adult would use the blanket, or the spoon, or the cup, or the bowl, but what might babies do? Can they come up with creative ways to use those pieces of technology?

Amelia: And research indicates that children are actually really good at doing this. So, in certain situations, young children can come up with more creative solutions to a task or a game or creative ways to use an object that might be different than the way an adult would use that very same object. And this is because children have less experience with how things work in the world than adults do.

When children are working on a task or exploring an object for the first time, they're more likely to pay really close attention to the evidence at hand, or what is happening exactly in that moment rather than assuming how something works and then basing their actions on the sort of previously held assumption. And this allows children to be really creative as they explore the world. So, for example, Marley, what might you do if I hand you a pencil?

Marley: I might start doodling with it on the corner of my page here.

Amelia: Yes, you might use this pencil as a way to make marks, but a child who's never seen a pencil before, that's probably not the very first thing that they're going to do, right?

They may use it to make noise, or roll it, or stack it. They may do any number of really creative things, and, eventually, they're probably going to figure out that they can make a mark with it. But not having this previously conceived notion or this framework built allows them to explore in ways that are incredibly creative.

Okay, so what about supporting emerging technology skills with children? What can adults or programs do to help children learn?

Marley: Yeah, so, okay, when thinking about babies, helping them explore new ways to use objects is a really great way to help them learn about how they can interact with the world in unique ways. You might, for example, during tummy time with an infant, you could place the baby's toy just out of reach – so maybe on top of another blanket or swaddle, and then you might demonstrate to the baby how you can pull on a corner of that blanket to get the toy.

So, in this example, the baby's using the blanket in an unexpected way, and it becomes a tool or technology that's used as a tool to get their favorite toy.

Amelia: I love that – thinking about how a blanket can become this piece of technology.

Marley: Mm-hmm.

Amelia: And this is also a great motor development game, right?

So, in addition to the strength that they're building in their neck and their torso during tummy time, this game also helps infants as they learn to reach, to grab, to grip, to pull. As we talk about so often, learning doesn't just happen in a single domain, but, really, across domains.

Marley: Yes, absolutely. So, we can think about how this might help support some language and literacy development, as well.

Amelia: Right. So, what might adults talk about when they're playing this game?

Marley: So, you might comment on how the baby is using the blanket as a tool – something like, "Wow! You are pulling on that blanket. And look! You got the toy."

Amelia: Yeah, this is so helpful to sort of extend that learning. You're helping create a framework, explaining that cause and effect.

Marley: And also commenting on something that that baby is really interested in – in that moment. My guess is they're staring pretty intently at that toy, so by labeling the toy and talking about it, you're really boosting these language skills.

Amelia: So, it sounds like technology, especially for little ones, is helping young children use objects as tools in creative ways.

How might adults encourage this creative energy at home or in a classroom setting?

Marley: One of the most important things is trying to create an environment where they really have time and space to use this creativity. So, providing stations or boxes of toys that have flexible open-ended uses.

Amelia: Yeah, and don't be afraid to place a variety of different things together in one spot that at first glance you might not think go together. You know, the plastic food and the scarves, maybe those go together. Who's to say that the dump truck isn't the best way to cook your dinner rolls?

[Laughter]

So, other than setting up the environment, what else can an adult do to support children's budding technology skills?

Marley: One of the best things adults can do is simply be observant. Adults can comment on what children are doing and prompt a conversation. Coaches can support teachers and home visitors can support parents to observe and notice creative ways that their child is using objects, and talking about them together is a really great way for home visitors to offer support in this area.

Amelia: And one of the things that I think is so great about this is that children are doing creative things all the time. So, there's always an opportunity to help support adults in this area.

Another thing to think about is that when adults ask a child a question, you know, it can be easy to assume that the adult knows what the child is doing. But the child may be using those blocks, for example, in ways that are so creative that the adult can't even figure it out.

Also, sometimes asking a "why" question, even if it's well-intentioned, might make that child think that they're doing something wrong. So, for example, "Why are you using blocks in the dress-up area?" A child might think, "Oh, no. I'm not supposed to be using these blocks in the dress-up area."

So, a better approach may be to say, "I notice that you're being very creative with these blocks. Can you tell me more about what you're doing?"

Marley: Another thing to think about is, how can that child respond to the question?

Amelia: Mmm.

Marley: So, for very young children, or maybe children who are learning more than one language, they might not yet be able to answer this question using their words, at least. So, adults can take their actions or maybe even just their continued interest in what they're doing as a response. It's also a really great opportunity to continue discussing modeling language and asking more questions.

Amelia: And as we know, that supports all children as they're learning.

So, today we've talked about just a few of the many ways that adults can help young children learn about technology. Remember that for infants and young children, learning about technology can be as simple as finding new and different ways to use a spoon, and that toddler might find more interesting ways to use that spoon than you do.

Marley: In your work supporting programs, consider creating or encouraging specific opportunities for training around what technology looks like for infants and toddlers.

This area of STEAM can be particularly confusing, but as we talked about today, it doesn't have to be. It also might be helpful to support programs in identifying ways that building skills and technology and tool use also support development across domains, including Cognitive and Motor Skills.

Amelia: For more information on supporting children's STEAM learning and for resources to give to programs, visit the ECLKC and search for "STEAM."

Thank you so much for joining us today, and we hope you tune into our next podcast in the series: Baby Engineers: Exploring the "E" in STEAM with Infants and Toddlers.

Announcer: Thank you for joining Head Start Talks.

For more information on what you heard today, visit the Early Childhood Learning and Knowledge Center, or ECLKC at eclkc.ohs.acf.hhs.gov.

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