A child and her friends were running from the patio to the willow branch hut and said, “We’re running late! Did you bring the GPS?”

Today, access to media and devices is ubiquitous: Infants, toddlers and preschoolers are digital natives, growing up saturated by media of all types and being exposed to—device that deliver media. This rapidly evolving phenomenon has pros and cons for parents of young children and early childhood educators to consider.

Mobile devices are especially prevalent. In this past decade we have seen smartphones, tablets and apps become integral parts of our lives. Nearly every home in the United States (98 percent) has a mobile device, and the average time spent using mobile media has tripled from 2011 to 2017 (Common Sense Media Census 2017). Screen media is available 24/7, and the escalation in the use of screen media shows no signs of slowing.

Although all of these tools are changing rapidly, and will continue to do so, we should not allow this to distract us from addressing the fundamental question: How can we best support young children’s overall development—cognitive, social, emotional and physical? I firmly believe that play best supports healthy child development. Children need time to think, to discover, to dream, to create. Screen media can augment play, but it can also interfere with it. According to a Common Sense Media survey of U.S. children’s media use from birth to age 8, children are using mobile devices for 48 minutes per day, on average. Clearly, this is taking away time that could be used for play: It takes time away from in-person interactions with other children, and with adults.

Just like a block to build with or a brush to paint with, screen media can be a tool to unlock an extraordinary amount of information to educate, inform and inspire. As screen time continues to grow and be an integral part of our lives and the lives of our children, it becomes even more important to understand how and when this tool is best used.

Several nonprofit organizations are researching children’s media usage—the positives and the negatives—and are publishing position statements. The National Association for the Education of Young Children (NAEYC), the Fred Rogers Center for Early Learning and Children’s Media, the American Academy of Pediatrics, and Common Sense Media are among the groups examining how screen media fits with the developing child. Since 2011, Common Sense Media has published an annual report on media use by children up to the age of 8. (See the CSM sidebar for highlights of the most recent report, which can be accessed in its entirety at http://commonsensemedia.org/research.)

In 2012, the NAEYC published a joint position statement with the Fred Rogers Center, stating: “When used wisely, technology and media can support learning and relationships. Enjoyable and engaging shared experiences that optimize the potential for children’s learning and development can support children’s relationships both with adults and their peers—technology brings wonder and excitement to everyday learning environments.” Both organizations highlight how media tools can enhance
exploration and learning, especially when parents are interacting with the child.

Perhaps one of the most poignant quotes from that report was from Fred Rogers about media tools and human relationships: “No matter how helpful they are as tools (and of course they can be very helpful tools), computers don’t begin to compare in significance to the teacher-child relationship, which is human and mutual. A computer can help you to spell H-U-G, but it can never know the risk or the joy of actually giving or receiving one.”

More and more households have a range of screen media—smartphones, tablets and, most recently, virtual reality. Parents are faced with a quandary: They may like/want/appreciate the technology, while at the same time they can also be overwhelmed by it and uncertain about how it best serves their child’s development. Even though the average time children spend consuming screen media

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<th>The Bing Times is published annually by Bing Nursery School, Stanford University. Bing Nursery School serves the Department of Psychology and Stanford University as a laboratory for research in child development and a site for teaching undergraduates.</th>
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has changed little since Common Sense Media began its census in 2011 (2 hours, 19 minutes per day), the move to mobile devices presents a significant challenge: They can go anywhere, they are always available, they’re easy to use, they are incredibly fun—even addicting—and their usage is difficult to monitor. And the gratification is immediate, which is a concern: One of the most important things we are trying to teach our young children is to delay gratification—think about how tempting that mobile device is compared to a marshmallow! And, it’s a 24/7 temptation.

There is temptation for both the child and the parent to reach for the device whenever there is downtime. For instance, on a car trip to Lake Tahoe, there is so much to see and talk about along the way—but if children are using a smartphone for all or part of the trip, they miss out on conversations, scenery, and opportunities to daydream or read a book. What we value as parents and educators will set the foundation for years to come. The growing amount of screen time sacrifices time that young children can be engaging in play, which research has proven best supports healthy development in all the domains—cognitive, social, emotional and physical.

**Some pros and cons to technology and child development**

Technology can offer information at your fingertips. For example, a child might be interested in trains. The child

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<td>This report presents the results of a nationally representative, probability-based online survey of 1,454 parents of children aged 8 or younger, conducted from Jan. 20, 2017, to Feb. 10, 2017. Overall the report found:</td>
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<td>1. Mobile use has become nearly universal. The proportion of homes with a mobile device went from 52 percent in 2011 to 98 percent in 2017.</td>
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<td>2. The digital divide has narrowed, but remains an issue. Among lower-income households (annual income below $30,000), 42 percent had high-speed internet in 2011, and 74 percent in 2017. Among higher-income households (annual income above $75,000), 92 percent had high-speed internet in 2011, and 96 percent in 2017.</td>
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<td>3. A third of all screen time is mobile. Among children 0–8 years of age, in 2017 the proportion of total screen time that is mobile was 35 percent—up from 4 percent in 2011. Other screen time includes TV, DVDs/videotapes, computers and video games.</td>
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<td>4. Contrary to recommendations from pediatricians, many children use media shortly before bedtime, and many families leave the TV on in the background most of the time.</td>
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<td>5. On average, children from lower-income families spend an hour and 39 minutes more time with screen media each day than children from higher-income families.</td>
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<td>6. The amount of time children spend reading has held steady since 2011, but many children under 2 are not read to regularly.</td>
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<td>7. Parents are concerned about the amount of violence, sexual content and advertising in media, but they are optimistic about the use of media for learning and supporting creativity.</td>
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<td>8. Pediatricians have reached only one in five parents with their recommendations about children’s media use, and have been more successful in reaching white, higher-income and more educated parents.</td>
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<td>9. Several cutting-edge technologies, including virtual reality, voice-activated assistants and internet-connected toys, are making their first appearances in children’s homes.</td>
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<td>10. Mobile media time has tripled—again. Among children 0–8 years of age, the average amount of time spent on mobile devices per day was 48 minutes in 2017, up from 5 minutes in 2011.</td>
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might have heard a train go by and maybe even the sound of the whistle, or perhaps saw it whiz past. But what about really up close? Together with a parent or teacher, the child might use an app on a tablet, computer or smartphone to see a train inside and out: to take a close look at the inside of the engine, the seats or compartments, to learn what freight a train might carry, and learn about different kinds of trains. The same goes for practically anything, and this can be exciting and educational for the child and the adult.

The ability to connect a child with family members who live far away has typically been accomplished with a phone call or occasional visits, but by using video chatting applications like FaceTime or Skype, they can see each other frequently. Grandparents and children can even have a meal together every night via Skype. Seeing someone provides a better experience than just hearing them.

One of the biggest concerns in selecting apps is that there are so many to choose from: How do you know what application is appropriate for young children? The choice can be absolutely overwhelming, and new apps come out every day. So many apps are deemed educational, but who decides this? Are they educational because the developer says so? There is no educational “seal of approval.” The fact is that mobile technology is everywhere, it’s easily accessible, and it is very difficult to monitor.

If a parent and child choose to watch *Sesame Street* on television or a computer screen, they can watch together (joint media engagement). Doing so enables parents to ask and respond to questions, point things out, and spend time with their child—as well as use what they watch as a jumping-off point to extend learning. However, with the move to mobile devices, this dual engagement becomes very difficult. As children grow older—elementary school and above—it can get harder to monitor what they are watching, which worries parents, and rightfully so! Mobile media can be a fantastic tool for adults and young adults, but for young children, it is taking away time from play. According to the American Academy of Pediatrics, higher-order thinking skills and executive functions essential for school success—such as task persistence, impulse control, emotional regulation and creative, flexible thinking—are best taught through unstructured and social (not digital) play, as well as responsive parent-child interactions. (See the AAP sidebar for recommendations for media use).

We know that young children learn best through play—unstructured play, with thoughtful adults guiding it. Through play, children learn patience and respect, and build resilience, problem-solving skills, executive function, creativity, cognitive flexibility, empathy, compassion, confidence, self-regulation and, most importantly, a love of learning that can last a lifetime. At Bing, we use technology as a tool. We use it as a research and reference tool when a book on the subject is unavailable. We use it for documentation and observation. And we may use it to record play for educational purposes. Because different types of technology are typically available in most homes, these days we also provide keyboards, phones and calculators to use as props in play.

Even though we live in the heart of Silicon Valley, where the latest technologies are being developed, it is important for parents to not feel pressured to adopt the latest device or app for their child too soon. The adults in Silicon Valley may be the early adopters of technology, but we don’t want our children to be. When it comes time for children to use tech tools, they are very intuitive and will easily adopt the technology. For young children 2-5 years of age, the American Academy of Pediatrics recommends no more than an hour a day of media, and suggests shared use as well. Play still remains the optimal activity for young children. If you want children to develop skills for the 21st century, let them play now! It is through play that children learn to collaborate and innovate, and these will remain essential skills for the future.

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**CHILDREN AND MEDIA TIPS FROM THE AMERICAN ACADEMY OF PEDIATRICS**

- **Make your own family media use plan.** Media should work for you and your own family values and parenting style.
- **Treat media as you would any other environment in your child’s life.** Set limits: Children need and expect them.
- **Set limits and encourage playtime.** Unstructured and offline play stimulates creativity. Make unplugged time a daily priority, especially for very young children. Media use, like other activities, should have reasonable limits.
- **Screen time shouldn’t always be alone time.** Co-view, co-play, co-engage with your children when they are using screens—it encourages social interactions, bonding and learning.
- **Be a good role model.** Teach and model kindness and good manners online. Because children are great mimics, limit your own media use.
- **Know the value of face-to-face time communications.** Very young children learn best through two-way communication. Engaging in back-and-forth “talk time” is critical for language development.
- **Limit digital media for your youngest family members.** Avoid digital media for toddlers younger than 18 to 24 months other than video chatting.
- **Create tech-free zones.** Keep family mealtimes, other family and social gatherings, and children’s bedrooms screen free. Turn off televisions that you aren’t watching.
- **Don’t use technology as an emotional pacifier.** Children need to be taught how to identify and handle strong emotions, come up with activities to manage boredom, or calm down through breathing, talking about ways to solve the problem, and finding other strategies for channeling emotions.
- **Apps for children—do your homework.** More than 80,000 apps are labeled educational, but little research has demonstrated their actual quality. Look to commonsensemedia.org for reviews about age-appropriate apps, games and programs to guide you.

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Dr. Deborah Stipek: Make Math Playful, Not Painful
By Holly Finn, Bing parent

There’s Singapore Math, which a whole nation and Jeff Bezos swear by. It starts with concrete, hands-on learning and moves to pictorial lessons, then to the abstract. And in global rankings of math achievement, Singapore has ranked highest or near highest in the world since the method was introduced. There’s Maya math, too, an ancient grid-counting system so sophisticated it helped Mayans become some of the world’s most advanced mathematicians and astronomers. Yet it’s so simple it can be learned in preschool. Of course, there’s also the kind of math you and I do every day when we weigh the cost of living on the peninsula versus everywhere else on the planet (a lot of subtraction).

Dr. Deborah Stipek came to Bing for our Distinguished Lecture this spring to talk about none of these. Instead, she focused on what she calls “Playful Math,” and the importance of teaching it to the very young.

First, she said, learning math early is good for your brain. Between 3 and 5 years old, brain development in the prefrontal lobe—which controls executive function—undergoes a big growth spurt. So, during this period, “it’s possible that engaging in math activities is helping grow the architecture of the brain.” And training in logical thinking offers social and emotional advantages, encouraging little people to see and call out inconsistencies when they clock them.

Second, said Stipek, learning math young sets you on a successful academic path. And she should know: She holds a doctorate from Yale in developmental psychology and is the Judy Koch Professor of Education, the Peter E. Haas Faculty Director of the Haas Center for Public Service and the former I. James Quillen Dean of the Graduate School of Education at Stanford University.

Turns out, skills entering kindergarten are probably predictive of skills many years later, in grade 8. If you’re in the highest—or lowest—quartile as a toddler, you’re likely to be in that same quartile as a pre-teen. “Entering school with high levels of skills actually helps you gain more as you go through.” And the reverse. If you’re behind at the start—exhibiting persistent problems in math, for instance—you’re less likely to finish high school (-13%) and even less likely to go to college (-29%).

The key to getting on the right path from the start seems to be a blend of “child-centered” and “teacher-directed” mathematical learning. Stipek showed videos to explain: A teacher using a shower curtain, for instance, teaches categorization, addition and subtraction. She divides the curtain into a grid and asks students to take off their shoes and arrange, sort and count them. Like Mayan math, but with Crocs.

“This isn’t flash cards,” said Stipek. “These kids didn’t know they were getting a math lesson. They were doing things with shoes.” That’s the key to Playful—you might say Stealthy—Math. It doesn’t feel obvious, onerous or overwhelming. This is a relief when you consider “math anxiety,” which, research shows, is pervasive ‘round the world—and may be passed along behaviorally from one generation to the next. (Check out the “The Math Anxiety-Performance Link,” among many other articles about fascinating studies, on Stanford’s DREME website.)

Learning math really can be as simple and fun as playing Chutes & Ladders, Dominos, War. Although these days “we avoid calling it war,” says Stipek. “We call it compare, double-compare—nice and neutral.” Whatever you call it, much of this is basic stuff. Not rocket science, just math. It’s stuff you can do at home—you probably already do—and everywhere else. Count the kiwis when you put them in your shopping cart. That kind of thing is a low-stress way to sharpen your child’s mathematical chops.

Bing teachers do this every day, of course. Consider snack time. It looks

By Darius P., 2 years

A couch for my mom. By Alessandro Q., 3 years 3 months

By Valentina A.-D., 4 years
like simple nutrition, but it’s ripe with math. There’s one-to-one correspondence: counting how many children are at the table, and how many plates are needed. There’s estimation and counting: How many pieces do you think this orange will have? How many seeds will this apple have? There’s more/less: Do I have enough cups here for everyone, and which of these clematis has more segments? There are shapes: What shape is your plate, and what other circles do you see in the classroom? And there are part/whole relations as well: Do children want a whole or half a graham cracker?

Playtime provides even more opportunities for the mathematical mind. Playing with Duplo blocks: How many people are riding on your train? During woodworking: How many pieces of wood did you use? How many nails? At storytelling: The class tallies votes for which book to read (counting, data analysis). Plus, maps are everywhere, as are manipulatives that encourage conversation about shapes (Magformers, tangram). And when a Twos child tapes together many strips of paper and wants to measure them—that’s math, too.

“I don’t see this as a zero-sum game,” said Stipek, explaining there neededn’t be a battle royale between Singapore and the United States, or anywhere else. The bottom line is to start early and often, with playful but purposeful lessons that stretch your child: “Kids are much more engaged and interested in the world” about the level of student engagement with various subjects they’re taught. Interviewer: “I ask if it’s different in maths, but it turns out it isn’t.” Best teacher in the world: “At my school, children love maths.” They do, they can, if the topic is taught (as well as learned) with delight rather than anxiety. It’s up to us to make that happen.

This will take patience. In nationwide studies of classrooms, teachers spent 71 percent of their time talking (2 hours, 19 minutes a day) and 9 percent of the time listening to the children (18 minutes a day). But math, like every other subject, demands reception as well as broadcast, a to-and-fro that makes it natural and fascinating. And fun.

Great. So if we can make math playful and purposeful, and do it early, we can enhance performance. But things get real when you get to standardized tests, right? When should we start to focus not just on knowledge gathering and retention, a parent asked, but on the time it takes for a child to complete the inevitable standardized tests? The answer from Stipek: “Never.”

“Being fast is totally irrelevant,” she said. “This is not about speed. It’s about applying what you know in novel situations.” It’s about math as a fun but crucial building block for critical thinking in daily, ever-changing life—which sounds about as ancient as the Maya.

Not long ago in the Financial Times, a legendary interviewer who’d recently become a math teacher and was struggling, asked the just-voted “best teacher in the world” about the level of student engagement with various subjects they’re taught. Interviewer: “I ask if it’s different in maths, but it turns out it isn’t.”

Best teacher in the world: “At my school, children love maths.” They do, they can, if the topic is taught (as well as learned) with delight rather than anxiety. It’s up to us to make that happen.

About the Author

Holly Finn, speechwriter and ex-journalist, is the former Marvels columnist of The Wall Street Journal, where she wrote about how science and technology are changing us. She was also the editor of How To Spend It at the Financial Times and is now on the communications team at Facebook. Best, she’s mom to Aves (East AM).

DREME TEAM

It takes a village—or a cross-disciplinary posse. In 2014, twelve top scholars from across academic disciplines and more than 40 doctoral students and post-doctoral fellows across the United States formed the DREME network. Their goal? Advance the field of early mathematics research and improve young children’s opportunities to develop math skills.

Today, Development and Research in Early Math Education (http://dreme.stanford.edu) is chaired by Deborah Stipek, professor and former dean of the Graduate School of Education at Stanford, and is going strong. DREME’s resources are a treasure trove for professional educators (not to mention parents!), including ours at Bing (http://prek-math-te.stanford.edu).

From online teaching modules to articles, activities and videos, the site explains the nuances of early childhood mathematical learning, and provides thoughtfully designed, playful learning activities to encourage it.

Watch a video of Ben learning math using simple pirate coins, and some pretty advanced thinking. Expert written commentary running alongside gives an even greater understanding of the subtleties of preschooler reasoning. See Ethan talk about one-to-one correspondence, while demonstrating his understanding of the concept of fairness: one rock for each family member. (Yup, morals sneak in with math.) And check out Charlotte, from an impoverished New York City neighborhood, who puts the lie to limits on learning as she deftly figures out equations. Her interviewer, too, shows top-class skill: listening so well she gives the young girl that greatest of luxuries: time to think.

As Bing teachers will tell you, and the DREME site makes clear, teaching math is intimately connected to teaching everything else—and best done with imagination as well as intent. Herbert Ginsburg, a Columbia professor whose research is featured on DREME’s site, puts it even more plainly: “In a sense, math education is literacy education.”
Professor Steven Roberts on Children’s Beliefs About Race and Group Norms
By Mischa Rosenberg, Teacher

Steven Roberts’ first memory of how race might affect his life comes from when he was about 5 years old. Roberts recalls his parents debating in his childhood kitchen in Bamberg, Germany. His father, a black Guyanese man, believed that when Steven walked down the street, others would perceive him as black. His mother, a white German woman, countered that Steven would be perceived as “mixed,” or multiracial. It had never occurred to Steven that the outside world might see and judge him based on the color of his skin. Was he a black kid? Was he a “mixed” kid? And what did these concepts mean? Why did they matter?

During our fall staff development day, Roberts, now an assistant professor in Stanford’s psychology department, presented his research on how children conceptualize what constitutes a social group in two domains: concepts of racial stability and group norms. He is currently conducting research on group norms at Bing.

In the first domain, Roberts conducted a series of studies that asked: When do children begin to believe that race cannot change? He described a recent study that investigated whether 5- to 6-year-old children believe that language or race is more stable over time. For example, if they believed language to be more stable, a child might reason that a black child who speaks French would be more likely to grow up to be a white, French-speaking adult than to be a black, English-speaking adult. The researchers found that black 5- to 6-year-olds made the race match, indicating their belief that race is more stable than language. White 5- to 6-year-olds more frequently concluded that language is more stable than race.

Roberts was curious: If some children reason that race is less stable than language, perhaps they do not conceptualize race as stable at all. He posed a new question. Do children believe that race is more stable than emotion? Roberts undertook a series of studies, with 24 children in each experimental group, to explore this question.

Children understand that emotions are constantly in flux. For instance, a preschool-age child can reason that a person who feels sad after an unpleasant event can eventually feel happy again. Roberts’ research found that white 5- to 6-year-olds reported that race was similarly able to change over time. They surmised, based on photographs, that a happy white child could grow up to be a happy black adult or a sad white adult—they did not systematically prefer emotion or race matches. Emotions were seen to be as stable as race even though they were known to be temporary. Black children ages 5 to 6 and white children ages 9 to 10 selected race as more stable.

Roberts also performed two variations on this study. In one, the researcher presented the face photographs along with a cue as to the photo subject’s emotional state. The researcher would say something to the effect of “this child is feeling happy” as they showed a photo of a smiling child next to photos of an opposite-race smiling adult and same-race upset adult. In this version, white children ages 5 to 6 and 9 to 10 selected emotion as stable. Black children ages 5 to 6 and 9 to 10 selected race and emotion about equally. In a variation with a race cue emphasizing skin color, all groups chose race as more stable.

In short, Roberts found that beliefs about racial stability develop with age and are related to one’s own race, and that the language used when asking the question can shift children’s responses.

In the second domain, Roberts spoke about children’s concepts of group norms. Roberts discussed descriptive norms (how things are) and prescriptive norms (how things should be), and how these tie into interpretation of groups.
Previous research suggests that children tend to think about social groups as prescriptive because of moral reasoning, in-group biases and socialization. Roberts proposed that beyond these factors, children have an “intuitive tendency to take what is and infer what should be.” In other words, if children believe that a group is a certain way, it follows that individual members of that group should be that way as well.

Roberts designed a study based on two fictional social groups, “Hibbles” and “Glerks.” He presented descriptive information to 4- to 13-year-old participants, 327 in all. Hibbles, he explained, eat one kind of berries, and Glerks eat another kind of berries. He then presented a scenario that showed conforming behavior (such as a Hibble eating a Hibble berry) and another scenario showing non-conforming behavior (such as a Hibble eating a Glerk berry). Half of the trials showed non-conforming behavior, and the other half conforming behavior. Roberts asked the participating child in each trial whether it was OK or not OK for a Hibble to eat that kind of berry. Most 4- to 6-year-olds (and older children to a lesser extent) responded that the non-conforming behavior was not OK. Older children were more accepting of non-conformity.

In a second study, Roberts removed all references to groups and focused instead on individuals. He presented an image of a single Hibble and said, “this one eats this kind of berry,” and a single Glerk, who ate the other kind of berry. Roberts predicted, and found, that children were less prescriptive in their judgments about conforming versus non-conforming behavior when presented with these examples. Children responded more often that it was OK to eat the other berry rather than that it was not OK. The conforming and non-conforming behaviors no longer reflected group regularities. Instead, they were individual choices.

The findings in these studies illustrate how, in the real world, merely seeing a group or receiving a label can be enough to elicit judgment and contribute to stereotyping and norm enforcement. Whether children are learning about Hibbles and Glerks or real-world categories such as race and gender, associating a group with a specific quality can propagate a descriptive-to-prescriptive tendency that enforces rigid and problematic beliefs. Roberts’ plans for future research on this tendency include looking at within-group variation and seeing how multiracial children—who embody multiple group memberships—think about group norms.

**Scholar Lin Bian on the Early-Emerging Gender Stereotypes About Brilliance**

By Frannie McCarthy, Teacher

Who is really smart? Would you assume men or women are more brilliant? Stereotypes regarding gender and brilliance are formed by the early elementary years, with most children assuming men are more brainy. Are you surprised? Many of the Bing staff at fall staff development day were when Dr. Lin Bian presented her research on gender stereotypes about intelligence.

Bian, a postdoctoral scholar working with Drs. Ellen Markman and Carol Dweck in the Department of Psychology at Stanford University, is studying gender stereotypes about high intellectual capabilities. At Bing, she continues this line of research with 5-year-olds. She also conducted studies looking at 4- to 5-year-old children’s understanding of nutrition, in collaboration with Markman, this year.

In Bian’s talk, “Who is really really smart?” The early-emerging gender stereotypes about brilliance,” she provided a new perspective for understanding the current gender disparity in certain academic fields—not just those in science and technology, but also some in the humanities, such as philosophy. This gender gap may be shaped, in part, by the beliefs adopted by practitioners of different disciplines concerning what is required for success. Specifically, gender imbalances may be largest in disciplines that portray success as being a matter of intellectual “brilliance”—something that women are culturally stereotyped as possessing less than men. In fact, one much-cited study published in the journal *Science* in 2015 by Sarah-Jane Leslie, Andrei Cimpian, Meredith Meyer and Edward Freeland found that women are under-represented in fields that are thought of as requiring brilliance. In her talk, Bian focused on the developmental roots of this gender gap by looking at the acquisition of the gender stereotypes about brilliance and how these stereotypes affect girls’ participation in these fields.

Bian described two sets of predictions that she went on to test. First, she predicted that the stereotypes against women’s intelligence would begin to be assimilated in the early elementary school years, and second, these stereotypes would affect children’s motivation, leading girls to avoid activities portrayed as requiring “smarts.”
To test her first prediction, Bian administered a number of tasks to assess 5- to 7-year-old children’s beliefs about which gender is “really, really smart.” For example, the researchers told children a story about a “really, really smart person,” without providing any clues about the person’s gender. The children were then shown images of four people (two women and two men) and asked to choose the one that they thought the story was about. Bian found that, at the age of 5, boys’ and girls’ answers were very similar: Both boys and girls picked people of their own gender as being “really, really smart.” However, starting at age 6, girls became less likely than boys to do this: Girls picked females as “really, really smart” less often than boys picked males.

In another study, Bian and her colleagues examined whether these gender stereotypes affected children’s choice of activities. The researchers introduced two games to 6- and 7-year-olds. One game was described as being “only for kids who are really, really smart” (brilliance game), the other as being “only for kids who try really, really hard” (dedication game). The researchers gauged the children’s interest in the two games and found that girls were less interested in the brilliance game (but not the dedication game) than boys. Their research also measured children’s endorsement of the “brilliance = men” stereotypes by telling them a story about a “really, really smart child,” as in the first studies. They found that girls’ interest in the brilliance game was lower if they endorsed the stereotype that brilliance is a male quality.

Based on her findings that the negative stereotypes about girls were not present at age 5, Bian predicted that 5-year-old girls would be as interested as their same-age male peers in the brilliance game. Her next study tested this by comparing 5- and 6-year-olds’ interest in the brilliance game. The results confirmed her prediction: The 5-year-old boys and girls were equally interested in the brilliance game, while 6-year-old girls were less interested than the boys.

Bian’s series of studies found that the negative stereotypes about women’s intelligence are formed by the early elementary school years. Once established, these negative stereotypes immediately influence the activities that girls choose to participate in, leading them to avoid activities perceived as requiring high intellectual abilities.

Looking forward, Bian is considering the sources of these stereotypes. She has already found children’s perception of which gender has high achievements in school to be an insignificant source, and she is looking into parents, teachers and peers as other possibilities. She is also investigating how to block the negative effects of these gender stereotypes on young children’s development. Future interventions may focus on providing role models, demonstrating gender equality and training teachers.

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**RESEARCH**

**Researcher in Profile: Masoud Jasbi on Children’s Acquisition of Function Words**

By Chia-wa Yeh, Head Teacher and Research Coordinator

Over the past three years, nearly 150 children at Bing have played a fun guessing game with Jazzy, a brightly colored hand puppet. For the game, children took one card at a time from a stack of cards. Each card pictured one or two animals. Jazzy’s job was to guess what was on the cards. Upon hearing Jazzy’s guesses such as “There’s a dog and a cat” or “There’s a dog or a cat,” children then told the puppeteer Masoud Jasbi whether the guesses were right.

But Jasbi was not an ordinary puppeteer. He was in fact a graduate student in linguistics at Stanford who recently received a doctorate. He brought Jazzy to life through his deft puppetry and animated voice with a big smile and a warm rapport with children. The game was designed to investigate children’s understanding of function words such as “and” and “or.”

What follows is an interview with Jasbi about his work.

Tell us about your early years.

I was born in Tehran, Iran, in 1988. Around that time, Tehran was being hit by missiles, but many children in my generation were lucky that in just a few months after I was born, the eight-year Iran-Iraq war ended. So I grew up in an era of hope and recovery. I went to the same all-boys school for 12 years (primary to high school), so I have many deep and lasting friendships from back then. My favorite hobby was sports, especially soccer.

Why did you decide to study language learning?

I was very interested in what makes us who we are. In the Iranian culture, like many Eastern cultures, knowing one’s self is considered the most important task in life. I think as a teenager I took that message a little too seriously. So I
read a lot about the human mind and soon got fascinated by how unique and special language is to the human species. I thought the best way to understand us is to understand how we know and learn language. Since Iran did not have a degree in linguistics, I went to the University of Manchester to get my BA and then came to Stanford for my PhD. My PhD dissertation advisors are professors Eve Clark, Michael Frank, Ellen Markman and Chris Potts.

**What studies did you conduct at Bing?**

I studied children’s understanding of the function words “too,” “and” and “or.” My games are often structured as guessing games. For example, in one study, there were cards with pictures of animals on them (e.g., cat and dog), and a puppet named Jazzy guessed what animals were on the card without seeing them. Jazzy would say things like “cat and dog” or “cat or dog.” Children told us whether the guesses were right or not. This setup helps us know how they understand words like “and” and “or.” I found that by the age 4, children’s understanding of these words does not substantially differ from adults’. Given how abstract the meanings of these words are, this is an impressive achievement for children.

**What got you interested in children’s acquisition and understanding of function words such as “and” and “or”?**

Function words are very special. When we think of a word, we often think of words like “dog,” “chair,” “red” or “eat.” But language isn’t just made up of nouns and verbs. Tiny function words like “the,” “or” and “too” are present in nearly every sentence and make the backbone of language. They are like nuts and bolts that put pieces of language together. They let us create complex sentences and convey abstract thoughts. Without them, we cannot communicate as effectively as we do. Discovering how humans learn and understand function words helps us understand the inner workings of human language and thought.

**What was your experience conducting studies at Bing like?**

Running studies at Bing is amazing for many reasons—the lovely staff and children as well as the beautiful school, to name a few. But perhaps the most important one for me was the environment. It is fair to say that the biggest challenge in developmental research is methodological: How can we best capture children’s knowledge and mental state? If children feel nervous or confused about what is going on in the study, we won’t be able to capture what we’d like to know about them. Rather, we collect noisy data, which are not useful to researchers.

Bing creates the environment where our research feels like home to children. They are comfortable interacting with us researchers and they truly enjoy participating in the games that we design for them. In fact, they are so comfortable that they often comment on our games too. One time, a 4-year-old told me that my game will be a bit hard for 2-year-olds and if I want to study younger children I should make it simpler! I really appreciated how engaged and confident children felt when they participated in my games. This environment had a significant contribution to the success of my experimental studies.

**What’s your next step?**

I’m joining researchers at Harvard linguistics and psychology to continue my research on children’s understanding of logical words like “or” and “and.” The broader goal of the research there will be to understand how children represent and learn logical concepts and the words for them.

**Anything else you’d like to share?**

Jazzy the puppet has accepted a permanent position at Stanford to help the researchers who come to Bing. If you happen to see Jazzy around, don’t hesitate to say hi and ask about the new games!
A teacher sits in the sand area of Twos, near the newly built playhouse. Several children are using bowls, spoons and pans in the house and at the nearby table. Teacher: What are we making today? Avi: Pizza … (He gathers a pizza pan and returns to the house.) Macaroni pizza! Teacher: What ingredients do you need? Avi: Munster, no, more things … cheese! We need cheese! He steps away to scoop sand onto the pan. The teacher turns to Tommy. Teacher: What are you making, Tommy? Tommy: Macaroni soup, it’s hotter. Avi: Here’s macaroni! It’s from our house. He pours water from bowl to bowl at the table in the sand area, singing “I’m making macaroni.”

The interactive cooking play that unfolded every day in the Twos sand area Tuesday and Thursday afternoon this winter. Teachers highlight such moments as examples of children functioning at the highest level, integrating their social, emotional, cognitive and physical selves. While all that is true, the children are also building a sense of lived democracy.

The idea of fostering the ideals of democracy often engenders visions of children voting about something happening in the classroom, such as which book to read or what name to give a pet. The abstraction of voting, counting votes, and the determination by majority is beyond the grasp of many young children. However, through their play, young children can have meaningful experiences with democratic ideals. In her 2011 study of lived democracy in Swedish preschools, Anette Emilson concluded, “On a more concrete level, democracy appeared as children’s opportunities to make their own choices, take the initiative, solve problems, think divergently and take risks.”

In a 1992 article published by Young Children, associate professor Joanne Hendrick identifies three practices that foster the principles of democracy in the early years: giving children the power to choose, the power to try, and the power to do. Children demonstrate all of these powers during their cooking play in the sand. The children in the sand area had the power to choose where to play, what materials to use and what to make. They could try to create whatever they imagined, and then had the time and space to do it, with support from a teacher if needed.

Throughout the environment, teachers set out materials to spark ideas, but the children have a strong voice in the purposes, practices, and uses of the environment. The teachers are certainly involved in observing, questioning, offering materials—prompting ways to extend the play. Yet they are continually responding to the ideas and preferences brought by the children. In this scenario, as in many play situations in the classroom, the teacher’s power and control are muted. In fact, the children take the role of cook, serving the teacher, in a role reversal from their everyday experience.

To highlight and extend children’s ideas, the teachers created menus that listed foods the children had previously stated they were making—some with corresponding illustrations. These menus became not only props for their play, but also a means for them to consider their own preferences and ideas in relation to those being presented. They elaborated on the menus or wrote their own, literally adding their mark to the play.

Living successfully in a democracy involves more than trusting and valuing one’s own ideas and competencies. Children also need to recognize that others have rights, too, and want to make their own choices. Within the democratic community, there are people with the power to enforce the rules for the welfare of all and make sure everyone’s rights are protected.

The interactive cooking play that unfolded in the sand area would not have occurred if children had been worried about others grabbing their dishes or flinging sand onto them while digging. Over the course of several months, the teachers have provided guidance about how to share materials (e.g., waiting until someone else is done with an item), rules for safe use of materials (e.g., not throwing sand), and reminders to keep in mind the proximity and needs of other children (e.g., not dumping shovelfuls of sand behind you onto the truck someone else is using).

While making choices about what to prepare, children experienced the diversity of preferences in the classroom community. Everyone has the right to his or her opinion. In one instance, a couple of children made soup in the sand area, offering it to peers. One peer stood upright on the red wooden board, responding, “I don’t want soup today.” The soup maker offered the soup again, to which the potential recipient again asserted, “I don’t...
want any soup.” The children continued playing in the sand area. The process of making food for others has provided multiple opportunities for children to examine their own preferences, and even to creatively problem-solve about possible solutions to meet everyone’s desires, as in the following situation:

A teacher tells children preparing food in the sand that she would like salad. A child responds, “OK, I am making your salad!” and she puts sand in a bowl and stirs it. When the teacher elaborates, “Can I have cucumbers in my salad please?” the child looks at her for a moment, then says, “Actually, I don’t like cucumbers, I don’t like salad.” She pauses for another moment, then says, “I am going to make you cake salad, I like cake!” The teacher smiles and awaits her cake salad.

The way teachers interact with children is an essential part of this process. Through her research in Swedish toddler classrooms, Emilson and colleagues discerned three communicative qualities among teachers that were essential for children’s lived democracy learning: emotional presence, playfulness, and respect and curiosity about children’s own experiences and understandings. In the 2008 book Educational Encounters: Nordic Studies in Early Childhood, Emilson highlights that interactions that have these qualities are more equal in power than interactions that are more teacher-directed. These qualities are intricately entwined in the play-based and child-centered philosophy at Bing.

Through interactive play, children develop an awareness that everyone has the right to be heard and a valuable contribution to make. They learn to recognize differences and similarities among people and to value diversity. They build confidence and competence at making decisions by experiencing control over their lives. And they come to view the adult authority as a person who respects them, seeks to understand them and wants them to pursue their interests. Here is lived democracy in action.

Helping Hands in the Twos
By Danielle Nakamatsu-Wong, Head Teacher

O

f all the classroom materials in the Monday/Wednesday/Friday morning Twos class, sponges, brooms and dust pans are, strangely enough, always in high demand.

And odd things seem to happen when no one is looking. Play items find their way back to their bins, snack tray stands materialize at snack tables, and puzzle pieces appear when children can’t find them. While this may seem mysterious, these occurrences are commonplace in this class: This class has an abundance of children eager to help.

During the autumn quarter, children showed an interest in what teachers were doing, particularly when it involved cleaning up. Occasionally teachers would invite children to participate in the cleanup, and many children would volunteer to put toys away, scrub the snack tables, and help push the sand and water tables aside. Soon children began to join in at cleanup time without being asked. Not long after that, children began requesting new ways that they could be of assistance. Children also displayed their knowledge of helpful jobs through their play. They would fight fires, catch bad guys, cook food for stuffed animals, and shush noisy people so their baby dolls could nap.

Because of this growing interest in helping, teachers began to focus curriculum around community helpers and the ways people help others in their daily lives. Rather than focusing on current knowledge and play themes, teachers decided to introduce new ways that people are helpful. Over the next few weeks the story time book and classroom activities revolved around a variety of jobs, including cleaning the house, collecting trash, delivering the mail, baking and working at the grocery store. The initial goal of the curriculum was to expand the children’s interest and knowledge of helpers, as well as to use this interest

Taking food orders and making menus.
Mix it, Mix it, Make it, Make it, Bake it... Yum!
Learning Through Cooking Experiences in Nursery School
By Nandini Battacharjya, Head Teacher, and Lauren Matheou, Teacher

As we started to provide cooking experiences this winter quarter, we noticed that many children selected this activity, stayed for long periods of time and returned throughout the week. We heard children gleefully entering the classroom asking, “What are we going to cook today?” The children soon expected and anticipated cooking as an everyday project.

Cooking experiences provide opportunities for children to learn principles of good nutrition and develop healthy eating habits, as well as explore elements of science, math, language and social connection. Baking involves chemistry as the children combine various ingredients and add heat or pressure. Preparing food offers opportunities to practice counting, measuring and learning fractions. Cooking involves new vocabulary as children gain pre-literacy skills following a recipe from top to bottom. Of course, cooking in the classroom requires children coming together as a group, taking turns, regulating their enthusiasm, and working toward a common goal. With all of the learning that’s happening, it’s important to remember that cooking with young children is all about the process.

As a way to feed interest in the project, we chose books to read during story time that related to cooking. We hoped this would invite children with a variety of learning styles to connect with and invest in the cooking process. The recipe from the book Thunder Cake amused children as it called for tomatoes. We heard children declare, “You don’t put tomatoes in cakes!” However, they were determined to make the same recipe as the protagonist in the story, and

Choices of books at story time incorporate themes about helping:
Trashy Town by Andrea Zimmerman
Mrs. McNosh Hangs Up Her Wash by Sarah Weeks
Eight Animals Bake a Cake by Susan Middleton Elya
Millie Waits for the Mail by Alexander Steffensmeier
LMNO Peas by Keith Baker

This simple yet powerful act of helping others shows the confidence these children have in their own skills and their ability to positively affect the world around them. The Dalai Lama has said, “Our prime purpose in this life is to help others.” If this is true, these 2-year-olds are well on their way to achieving that purpose.
were delighted to discover that the tomatoes added moisture... and how tasty the flavor was! Noll wanted to share his school cooking experience with his grandma, who was visiting, and reported on how the process unfolded: “We put flour and butter and sugar. We used a mixer! It did not look like what it was supposed to look. We dumped it in the trash can. Then we started all over again. This time, it looked like it was supposed to be. We put it in the oven. Daddy took it out of the oven for us. It tasted good. Grandma said, ‘Noll, you are a good baker. I liked it a lot.’”

As the quarter progressed, we gave children various ways to engage in the cooking curriculum. We introduced appliances and tools that children might not have seen in their home kitchen, including a pasta-making machine. The hand mixer was popular with children, as it was one of the kitchen tools they felt confident using independently. Pressure cookers lined the counter one week as the group followed a more complex recipe for vegetarian dumplings. Inspired by the story Yoko, we invited parents to come in and cook traditional dishes with us from different parts of the world, including Korean sushi, Indian pakoras and parathas, Russian blinchikis and Mexican tostadas.

The Little Red Hen Makes a Pizza
weaves in the virtue of being helpful, and the pizza-making table was filled with helpers that week. They were fascinated by the yeast, especially when they realized it’s alive. We began the morning by “feeding” our yeast sugar and warm water, so that it could wake up and help our dough rise. We practiced precision as we used various measuring and mixing tools to prepare the dough. Next, we rolled the dough flat before carefully pinching the crust. The children incorporated their sense of smell as they learned to recognize the fragrances of the herbs and spices that were added to the tomato sauce. Grace, who often uses our garden’s rosemary in her outdoor dramatic play, was delighted to clip some to use “for real” as we mixed some into our dough one day. Throughout the week, children created a variety of pizzas—with or without sauce, cheese and olives—proudly stating their preferences.

The pun-filled companion books Spoon and Chopsticks conveyed messages of self-confidence and empathy, and we invited children to cook dishes that can be eaten with these utensils. Warm granola was topped with milk, and the chili surprised many children, who enjoyed vegetables they wouldn’t typically eat. We provided chopsticks for children to eat steamed dumplings, but they also enjoyed the challenge of using them with mandarin slices, apple pieces, cheese chunks and even graham crackers!

Children played out and extended their cooking experiences in dramatic play scenarios throughout the classroom. We had chefs cooking indoors in costume. In the play yard, restaurants sprouted up with handwritten menus. The sand area inspired a variety of baked goods, from pies to muffins to cakes. Twigs in the sand were also transformed into noodles, as children referenced the story Strega Nona. The sensory table often became a test kitchen for pineapple upside-down cake, magical potions and soups.

As we reflect on the quarter and have snack-time conversations about our classroom cooking, we see how much children have learned through this project. Children gained practice in turn-taking, measuring and patience as they followed a set of instructions from start to finish (including cleanup). Children who frequently cooked during our mornings together or at home began imagining their own unique recipes, often integrating ingredients they had worked with in the classroom. Through their drawings and recollections, children shared their observations and interests in the food and how it was prepared. We learned about texture, personal preferences, and trial-and-error. We experienced the joy of preparing and sharing a meaningful dish with our community, and how cooking and eating naturally bring people together and foster a sense of belonging.

When parents brought in recipes from their family, the children got a sense of how recipes can spark memories for individuals and hold significance within different families, countries and cultures. Teachers heard from parents how children eagerly awaited the recipes in the weekly emails, so that they could revisit these dishes with their loved ones at home. Parents and teachers found that these shared experiences in school encouraged a willingness to taste new foods and a curiosity about other cultures and traditions.

As children departed for spring break, we provided a compilation of the quarter’s recipes and related stories, along with a set of chopsticks. We wondered if the cooking curriculum would naturally culminate with the end of the quarter, allowing us to reintroduce more of the fine art materials into the daily experience. However, on the first day of spring quarter, many children walked by the art table with a look that seemed to say, “I remember when this was the cooking table…” Hans, one of our most ardent cooks, confidently approached the table with a familiar question: “What are we going to cook today?” We may have paused our daily cooking adventures at the art table, but the joy of cooking continues to be felt and shared throughout the indoor and outdoor environment.
For as long as the human species has been able to communicate, stories have served as a means for expression, interpretation and record-keeping. The urge to create, share and understand narratives has been wired into us through the evolution of the brain, which employs the cause-and-effect processes that also drive stories. And storytelling is not only the activity of children: As adults, we devise stories, both long and short, throughout most of our waking moments, often without even realizing it. These adult stories might be internal conversations, interactions with loved ones or coworkers or the mental recounting of a significant event from the last day or the last decade.

This thirst for narrative begins at a very early age and was especially evident to the West PM teachers as the autumn quarter in 2017 commenced. In all corners of the classroom, stories naturally unfolded: A teacher transcribed a child’s words for her story at the language table. In the area of the play yard known as the Back 40, a group of children verbally narrated the action surrounding the solar system exploration of a team of astronauts. Another group of children assigned roles and relationships for a family-run sand area bakery shop. On the patio, a hollow-block building served as the home for a group of police dogs bringing a saga to life. In each of these dramatic play settings, children take turns offering ideas and assuming leadership roles in the play, using this dynamic mix of creative brainstorming, layered story building and revolving perspectives to build their communal narratives.

As often happens in our classroom, the teachers followed the story-related interests of the children into what is known as a project. A project is a hands-on, integrated classroom unit of study that often arises from the pursuits and foci of the children. Through cross-disciplinary collaboration between children and teachers on the curricular focal point, both individual and collective meaning can be uncovered and shared.

Perhaps one of the most potent homes for our new project was the language table. The language table is usually home to books and stories of all sorts. Adult-authored fiction and nonfiction is read to the children, often by a teacher but sometimes by a visiting parent or even a child or sibling who has begun to read. A child might pick up a “book” (copy paper that has been folded and stapled to create the pages of a book, complete with a construction paper cover) and begin to create the illustrations before asking a teacher to write accompanying text. In fact, some children are also interested in writing their own stories, piecing together text through the process known as inventive spelling: For example, “love” might be spelled as “luv” as children sound out words. The timeless and powerful tradition of oral storytelling is also alive and well at the language table, as eager children verbally share their experiences, hopes and dreams.

Stories and storytelling permeated every corner of our classroom. The teachers noticed recurring themes, such as the group of police dogs, and new stories arising spontaneously. During winter quarter, a group of children created a narrative involving a cheetah family. In their story, the cheetahs lived on the small outdoor stage, the grass was water, the bridge became the family’s boat, and a hill turned into an active volcano, an important element to their narrative. As the relationships and context were being built, a child offered that the volcano “doesn’t shoot out like this [hands low to the ground]. It erupts this high [hands high over her head],” while another mentioned that the water near the volcano is “really hot. But the cheetahs like it.” On the small stage, several children used the blocks to construct their home and were soon joined by two others. One cheetah told another, “I’m your sister, remember?” The other took in this information, then replied, “Remember, I’m your sister. I’m just helping out.” The cheetah family continued to grow, with one cheetah announcing, “I’m the little one! I’m the baby!”

The West PM children drive their own narrative, often through physical collaboration. Here, they use blocks to construct a home for their cheetah family story. The dots are raindrops. The teal is where they get water. The yellow is the bedroom; the purple is the kitchen. You can’t see the people since they’re hiding. By Phoebe F., 4 years 5 months.
brother.” As the game unfolded, the cheetah family established that they lived in Africa (the small stage) but worked in Australia (the sand area house at the other end of the yard). As part of the game, the cheetahs had to cross the ocean and climb over the volcano to reach Australia.

At snack time, the children enjoyed sharing personal narratives about their lives but also welcomed the opportunity to create a group story. Known in our classroom as a round robin story, this creative process is a basic yet effective version of oral storytelling. Round robin stories are pretty straightforward: One child at the snack table offers an idea to start the story. The story then moves around the table, with each subsequent child building upon the story with her own idea. This is an enjoyable and highly creative process that can work in almost any setting with a group of willing children (or adults).

Here is a round robin story from a West PM snack table. The storytellers were Claire, Henio, Henry R., Jack, Katherine L. and Ainsley:

Once upon a time, there was a pear. And the pear was growing on a tree. This was not any ordinary pear—it was a magic pear. The pear turned into a funland! Then the funland turned into a tree. And then it turned into a strawberry and a plate and a super-duper magical phone. The phone and the plate and strawberry fell into the mud and they turned back into a pear. And then it fell into mud and then died again. It climbed back on the tree and then fell again and then went to a spider web and then got trapped and then tried to get out but then it turned into a tree. The End.

Story time, which ends our afternoons, was also a daily opportunity for exploration of stories and storytelling. Over the course of one week the story time teacher reads the same picture book each day, to provide children the chance to create ownership of and investment in each specific book. In our quest to explore all varieties of storytelling, teacher Maryam presented the award-winning wordless picture book *The Lion and the Mouse*—a retelling of the Aesop fable by artist Jerry Pinkney—which inspired the children to add their own narration:

“The mouse is eating,” said Katherine L.
“The owl is coming to eat the mouse. The claws are trying to get the mouse. It’s getting closer to the mouse,” said Alessandro.
“The lion is in front of the mouse,” said Nixon.
“The mouse thinks it is safe, but there is actually a lion there!” said Karam.
“The lion says, ‘Oh, I want to play with you …’” said Rafi.
“The lion says, ‘Grrrrrrr …’” said James.

The pictures we read during story time each week are thoughtfully chosen, based on criteria such as repetition, theme, rhyme, plot and characters. Many of our story time books lend themselves to what we call a *story play*. A story play is essentially a dramatization of a picture book. In our class, story plays often take place on our patio during the post-snack music time. For example, in late October, teacher Vanessa read *The Leopard’s Drum*, written and illustrated by Jessica Souhami. On the patio the following week, Vanessa facilitated a story play during music time. To prepare for the story play during the afternoon, children honed their fine motor skills by collaboratively creating props and costumes using paper, colored pencils, tape, scissors and staplers.

At music time, *The Leopard’s Drum* story play began. With focus and conviction, the children adopted the roles of the characters in the story. Some children knew the story so well they were able to recite their character’s dialogue word for word! As a result of the story play process, children bravely shared their creativity with each other, while also developing their self-regulation skills as they waited patiently for their turns. When the story time picture book lends itself to dramatic reinterpretation, the teachers are excited to facilitate music time story plays that foster teamwork, resourcefulness and competence.

In early April, the storytelling project was deepened by a visit from an author. Stephanie Lucianovic, mother of West PM student Arthur, is an author who has a picture book scheduled for publication in 2020. She asked the children, “Where do ideas for stories come from?” Stephanie explained how many of her picture book ideas emanate from her daily life. *Hello Star*, the working title of the above-mentioned manuscript, came from Stephanie’s 5-year-old son (and West PM alumnus) Henry, who said to his mother as an astronomy-loving 3-year-old, “Did you know that stars die? Isn’t that sad?” Stephanie also shared with the children the relationship between a picture book’s author and illustrator, and introduced words and concepts such as author, illustrator, editor and manuscript.

Our classroom project about stories has created an open-ended narrative into which the children have eagerly inscribed their cognitive, social, emotional, physical and linguistic capacities. While their chronicles will continue well beyond their time with us, the West PM teachers were fortunate to be able to craft a space for ideas, dreams and adventures. We look forward to enjoying future installments from the lives of these young storytellers.
The teacher-parent partnership at Bing is vital to best support the child’s school experience. During fall intake meetings or informal times at drop-off or pick-up, parents ask us questions about the school’s play-based pedagogy and the values inherent for the children. One aspect of a play-based environment comes up especially frequently: What happens if my child doesn’t seem ready to “go play” like other children? What if my child is quiet or observing at this play-based school? What happens then?

Parents express to us their hope that their child thrives at Bing, a child-centered environment specifically designed for young children by founding director Edith Dowley. Granted, the spacious indoor classrooms along with the half-acre outdoor play spaces are extraordinary. Yet what does it actually mean for a young child to thrive at school? If Bing is anchored by Dowley’s words “children are treated as honored guests,” then what do educators do when children are cautious or stay back from engaging in some forms of play? What does happen then? The following story gives a glimpse into how a teacher might initially connect with such a child:

A boy, a little over 3 years old, stands in the doorway by the art area of East Room that leads out to one side of the outdoor play space called the Neighborhood. He keeps his shoes planted firmly on the tile floor while he leans his body a bit to the right then the left, glancing outside in both directions.

After a few minutes, he asks, “What are they doing?” The teacher kneels down next to him and comments, “Oh, you are watching the children run past you. You are wondering what they are playing?” “Yes, what are they doing?” the child repeats.

“Hmmm, it looks like they have backpacks on and are carrying bug jars. I wonder if they’re having an adventure. I wonder if they’re on the lookout for something. What do you think they are doing?” says the teacher.

“I don’t know. I don’t know why they are running. I think they might be bad guys,” responds the boy. He continues to observe the children, maintaining his position in the doorway, shoes still planted firmly on the tile.

The teachers at Bing work to build a relationship with each child. We want to know them individually to understand their preferences. We talk with them, observe their physicality and learn their approach to entering school on any given day. All these factors, and more, influence children’s perspectives on what is happening at school and their role within the class community. As teachers, we might look to sociologist Mildred Parten’s stages of play to see where a child such as the boy standing in the doorway might be in his development.

Even from birth, children begin actual stages of play—infancy is mostly unoccupied play, where the baby is beginning to explore movements of her body, which leads to the second stage, solitary play, where the toddler is engaging independently with materials of interest. The third of Parten’s stages is the onlooker stage and is seemingly where we found the boy in the doorway. Typically, at this stage, children observe peers’ play yet tend to not join into the play scenario.

The boy is trying to unpack what is happening, and the teacher’s role is to help interpret what is unfolding. The teacher often narrates or gives a brief summary of the play, so that the child also gets the message from the teacher that what the other children are doing is what play can look like at Bing.

Younger children also might gain language for the play they are observing: “Adventure” might be part of children running fast, “exciting” might be when children jump off the red boards, “hide-out” might be a hollow block structure where children are peeking out the top.
There is nuance in entering dynamic play and understanding what is happening all around you. Parents have chosen Bing for the unstructured play, the choices and the freedom for children to self-direct anywhere in the environment. Yet for the child, it may not come easily or naturally to just “go play.” Many children need time to survey this place that is Bing to gain comfort in the freedom to move about inside or outside.

When the child was standing in that doorway, he was gaining a sense of how children use the environment and engage with each other. We know that many other experiences he has at Bing—such as painting at the easel, exploring at the water table, having snack time with a small group of peers and a teacher, digging in the sand area, building in the block area—will accumulate to broaden his understanding of this play arena and inform his own role amid the diverse company of players.

The boy, now aged 4, has established a bond with another 4-year-old in the class. Their play is anchored by a wagon—one boy pulling the wagon, the other boy inside it. They travel the pathway that runs around the perimeter of the yard, periodically stopping to use their play keyboards—“We have to do so much work on our computers!”—or adding something to their collections in their backpacks. The two boys maintain this friendship for months, seeking each other out upon their arrival and running off together to find a wagon.

This stage of play between the two boys is called associative play, where children have developed a connection and have broadened their play beyond the stage of parallel play, where children play next to each other yet tend to not coordinate their play. Teachers might interpret this development as an opportunity to broaden other social experiences for the boy. For example, we might mention to the child that we noticed two other children who also have been having adventures with wagons, saying “I wonder if those children are using their computer keyboards, too?” This “wondering out loud” might give enough interest for the duo to go investigate the other children’s wagon. The teacher might follow along to see if there is a connection to be made or a way to facilitate one between the two pairs.

In concert with the stages of play, teachers might also look at temperament to understand a child. A number of considerations for temperament include adaptability, activity level, emotional sensitivity, mood and attention span. These descriptors help us understand who the child is in order for us to best support the child’s interests and needs. Teachers can then adapt our expectations to the child’s temperament so the child feels understood, listened to and accepted.

When we think about the boy in our example, we see that at 4 years old he was comfortable emotionally to enter into duo play with a peer—clearly a development from when he would observe dynamic play running past him from the doorway. Teachers might look for opportunities to make connections between children with similar temperaments—or sometimes opposite temperaments. Often, a quiet or sensitive child feels safe and included if a more social child takes the lead in a play scenario. Other times, children who are close in temperament feel comfortable together, as neither is the leader or follower, which can allow for the play to feel balanced.

Teachers at Bing honor each child’s temperament and stage of play, ensuring the child is the agent of his or her learning. This combination is how children thrive at Bing. Teachers have partnered with parents from the beginning of their children’s time in our classrooms to ensure we know as much as we can, and continue to learn, about their child.

Each teaching team has a weekly meeting to discuss children and curriculum, including ways to support children as deemed appropriate for next steps. We share with our teaching team relevant photographs, showing, for example, new friendships formed or a child using new materials. We write down anecdotes about children broadening their social experience for team discussion. We also share this information with parents, so their knowledge about how their child is engaging at Bing and the child’s social connections is kept current.

This communication between home and school can help build positive memories of the child’s time at Bing. At home, a parent can spark conversation with their child about a play area to return to the next day at Bing (“Your teacher said you were digging a big river in the sand area yesterday!”), or reference a play scenario (“Oh, were you playing pirates on the grass?”) or materials with which the child had experimented, such as the funnels and pipes at the water table.

While much of a teacher’s work over the course of the year is to narrate play, introduce materials or bridge friendships, we know that thriving at Bing might look different for each child.

The boy, now aged 4 and a half, is running outside with a group of children. The group has an established game of Tiger Family, and they live under the small, purple-flowered tree on the hill. They often run across the yard to the boat, sometimes play fighting, then run back to the tree to take care of the baby tigers in their family. The child is one of the tigers in the family of 8. He likes climbing into small spaces amid the low branches of the tree and huddles with his streak of tigers.
When teachers consider creating an environment to engage children’s minds, they typically focus on the indoor setup. Historically in educational settings, outdoor spaces have been viewed as a place of recess. But what about a teacher who gives attention to the outdoor space? Such regard for the outdoors as part of the learning environment speaks well of an educator’s practice. At Bing, conceptualizing the outdoor space as part of the rich learning environment designed to encourage deeper understanding of subject matter across all domains is an important component of our work with young children.

When Edith Dowley, Bing’s founding director, shared her design of the school with architects in the mid 1960s, it was evident that Dowley understood the impact the outdoor environment could have on young learners. This was at a time when the outdoors wasn’t seen as a vital component of the child’s cognitive education. Each outdoor space at Bing was shaped by Dowley’s emphasis on encouraging freedom of movement. In addition, when creating the yards, Dowley avoided overcrowding them with typical playground equipment, preserving space for naturalistic attributes such as rolling hills, gardens, and trees that would grow tall. Dowley planted one tree for each child when the school opened. She included odd-looking trees, bushes, and flowers in the yards so that children could ask about gnarled branches of twisted willows or umbrella-like Nile lilies. The trees provided fresh air and homes to a variety of animals and insects. Their large branches created shady spaces for children and adults in sunny weather and became umbrellas during wet seasons. This intentional outdoor design allowed the space to be used year-round to enhance physical, social, emotional and cognitive development.

In Center PM this past year, the Redwood Grove, which is on the west side of the yard, continued its legacy of attracting children’s attention as a place for inquiry, exploration, discovery and collaboration. Perhaps it was the sight of the tall redwoods reminding them of a campsite? Or the sensation of bark beneath one’s shoe or a bug crawling on the palm of a hand? Or was it the sound of chirping birds on branches above? Or the smell of a bloom or taste of a culinary herb from the hilltop garden? It could have been all these things, but, as Italian education scholar Carla Rinaldi has argued, an intentional setup in the environment was needed for the beautiful setting to move beyond being a background to being a key player in the children’s learning.

To organize the space in a manner that supports children’s knowledge and desire to investigate beyond the surface, teachers need to factor in the children’s interests and capabilities. Following are three of the many interactions, discoveries and developments of skills that have occurred in the Redwood Grove during this past school year.

The Redwood Grove: A Place for Inquiry, Exploration, Discovery and Collaboration

By Nancy Verdzabella, Head Teacher

The Redwood Grove: a place to develop new understanding of real-life scenarios

The Redwood Grove has been a place that many children come to play with a partner or a group. Like most years, a common play theme involved the role of the firefighter. The interest in firefighters intensified when children became cognizant of the wildfires in nearby Sonoma and Napa counties. For weeks children talked about how firefighters were working hard to keep people, buildings and trees safe. The Redwood Grove became a setting where several children began extinguishing make-believe fires. A teacher observed this and provided markers, scissors, and red, yellow and orange construction paper at a table in the grove the following day. One child in particular noticed the color selections of paper, and with no adult prompting said, “I’m making fire.” He used the supplies to make his version of flames and placed them on a nearby structure. “It’s a fire. Quick, help me put out the...
“Fire!” he yelled. Instantly children came from all directions, identifying themselves as firefighters. Some children had used pieces of rubber tubing or sticks as hoses, while others just pretended to have the necessary equipment to extinguish flames. This prompted more children to join in by creating additional flames with construction paper and spreading them throughout the redwoods. Quickly and collaboratively, the children extinguished the spreading fires. “We need to save the trees! We need to save the houses!” they yelled. When one firefighter needed to rest, new powerful voices entered the scene and said, “I’ll help.” Many teachers and parents witnessed the level of collaboration and organization amongst the children, which was a testament to their competencies. The children created scenarios that supported real-life problem-solving skills and collaboration. The naturalistic setting welcomed large body movements and loud voices. The meaningful work of extinguishing flames allowed the children to feel powerful, and it demonstrated their competencies in teamwork, as it was crucial for firefighters to work cooperatively in order to stay safe.

Several days later, the same child who made the first flames out of construction paper returned and diligently worked on coloring a new fire. This time, however, it was not an uncontrolled flame. Rather, he placed it on a stump near the willow hut, and the flame became a source of light and warmth for his camping expedition. “I am going to roast a marshmallow,” he stated loudly. Instantly children came from all directions, once again wanting to join in, remembering that fire when constrained can be an enjoyable element, too.

The Redwood Grove: a place that can transform into a musical oasis

A master musician and Center PM teacher, Tracy Wu, gifted us on a regular basis with the sound of music played on her violin. When the melodies were played into the open, outdoor space of the Redwood Grove, children found their way to the forest-like setting to enjoy the sound of beautiful music. It was an ideal location for children to fill their hearts with the sound of music, while exploring activities that engaged their creative minds. The minute a child stepped into the outdoor space, she followed the melodies coming from the Redwood Grove. She gravitated to the xylophones that were purposely displayed in the pathway. Without any verbal prompting, she contributed to the existing musical sound by playing the xylophone. Furthermore, recognition of familiar tunes prompted children to sit on tree stumps and sing together using both voices and sign language.

Children who were drawn to the sound did not always participate with singing and composition, but it was apparent that the music influenced children while they pursued other interests. Teachers noticed a heightened sense of commitment. One child drilled holes into a thick wooden board nestled between two redwood trees for a solid 30 minutes as he listened to the music. When it seemed like his project had come to an end, the music would escalate and he would return to work with a burst of energy. At one point the child looked at the teacher and said the music made him “feel so, so, good!”

The Redwood Grove: a place for investigation

In general, most young children find bug exploration to be of interest. However, this class group had an unusually large number of children dedicated to extended searches for tiny specimens to study. The Redwood Grove became a laboratory for these investigations. Children would dig in the dirt, look in the cracks of tree trunks, and flip over
they crawled in the large tray. Children helped gather twigs, bark, leaves and flower blossoms to add to the habitat in order to help them feel more at home. Although the facilitating teachers had some knowledge about snails, their role was primarily to support children as observers, while the children sorted out for themselves what to focus on.

One experience that stood out is as follows: After spending time observing snails the day before, a child who at that time was most comfortable speaking in Mandarin and Spanish returned to the Redwood Grove and began to gently turn over leaves. She found three large snails before spontaneously asking in English, “Where’s baby snail?” With the next turn of a leaf she said, “Oh, there you are, baby!” She carefully held the snail in her palm and looked at its small, cracked shell.

On the third day, she returned to the snail tray and noticed that some occupants were missing. She was pleased to find the baby snail once again and reexamined the cracked shell. After some time with the snail, she decided it needed a home of its own. She made a house using a small box and patterned decorative paper. The child added pieces of ivy leaf along with a flower petal for food. She then looked around for the snail. “There you are, snail! You want to eat this?” referring to the rosemary branch the snail had slithered to. She plucked one rosemary leaf and added it to the box, prior to laying the snail inside. “You have a food too,” she reassured the snail. “There you go. For a yummy food!” She covered the snail house with a large ivy leaf. “There you go!” This impelled her to make a house for the big snails, and care for them in the same way.

The grove is a world where tiny creatures thrive. It’s no wonder that this child spent extended amounts of time in this space throughout the week. As she observed the baby snail, an empathetic relationship was being formed. It prompted her to build snail houses and provide nourishment by collecting foliage from the surroundings.

The experiences described here are just a drop in the bucket of the rich learning that occurs daily in the Redwood Grove’s camp-like setting. We thank our visionary founding director Edith Dowley for preparing the way with her thoughtful design. It has been 53 years with just a few minor updates since those first trees were planted. Now “they are taller than the sky,” exclaimed one child. No doubt the legacy of the Redwood Grove will continue to engage children, families and educators for many years to come.

Top: A child repurposes materials to make a home for the snail. Bottom: The home for the big snails doubles as a tool for getting a closer look at snails.

Wool Project: The Unraveling of the Story of Wool in Center AM
By Parul Chandra, Head Teacher

Next to our dramatic play area is a discovery table—a table holding items for children to explore hands-on. Inspired by the cold weather on our return from the winter break, teachers set up the discovery table with objects used to create cozy, wool clothing. Baskets of wool, balls of yarn, carding combs and books on sheep and wool attracted the children’s attention. The rich sensory experience of handling wool immediately drew children to examine it more closely: They all expressed delight in how soft, fuzzy and comforting it felt. From sewing, dyeing, finger knitting and weaving, children have thoroughly enjoyed this material. Not only are these activities pleasurable, but they help to promote children’s hand-eye coordination, increase concentration in following directions and foster an understanding of basic patterns: Nico said, “This is a pattern … blue, red, brown, yellow, and blue, red, brown, yellow.” Tara said, “Sewing is weaving. The needle goes in and out in sewing. Weaving is going upstairs and downstairs, upstairs and downstairs. This is a blanket.”

Baskets of yarn were placed throughout the classroom, both indoors and outdoors, and children used this material in creative ways. Julian A., who was building with unit blocks, cut a small piece of yarn and placed it between two blocks to “glue” them together.
for stability. In the dramatic play area, Maria, Eloisa and Katie were busy making pasta, using individual pieces of yarn and big balls of yarn for potatoes and meatballs. Another group of children wrapped yarn around chairs to make a spider web. Wool and yarn were everywhere in Center Room, and children seemed to integrate it into their play seamlessly, whether individually or collaboratively. Children also enjoyed reading books on wool and yarn and extending these stories through dramatic play. As they learned about the process wool goes through to become a sweater, they integrated new vocabulary into their play: wool, yarn, fiber, string, shearing, webbing, carding, weaving, spinning, dyeing and knitting. Ruby said, “I learned how to knit. I had to use chopping sticks. You use yarn on the stick. The teacher starts and I do the rest.” Teachers became co-investigators in unraveling the many theories and ideas that emerged during small-group discussions. While children explored these materials, teachers asked questions to extend children’s learning. This phase of the project was particularly important in highlighting children’s thought processes. Each child had an opportunity to share his or her thoughts and listen to peers’ ideas on the topic. Some of the teachers’ questions were: What is wool? What do you know about yarn? Where does wool come from? How do you make warm clothes with wool? What animals give us wool? What is the difference between yarn and string? Following are some of the children’s ideas:

Angelina: “Wool is fluff from sheep.”
Lucy: “Yarn is wool. You have to spin it.”
Emilia: “Yarn is string … something that gets spun.”
Michael: “You just have to shave the wool and it will be yarn.”

Natural dyes like turmeric, red onion skins, blueberries and tea bags were used to color our felted wool. These were used to make collages. Since our children were so invested in the wool project—asking questions, experimenting, extending what they learned in their explorations with wool—we decided to invite experts in the field to share their skills with our classroom community.

Spinning wheel
Aviva Garrett, our visiting expert at spinning wool, demonstrated how to spin wool into yarn and showed us the different kinds of fiber that you can spin, such as silkworm cocoons and wool from alpaca, rabbit and goat.

As she demonstrated, Garrett also added words to our vocabulary such as card, treadle, bobbin, flyer and spindle. For instance, we learned that treadling is turning the wheel by pedaling your feet. And we learned that wool is any fiber you can spin.

The children were able to feel the different kinds of wool, card it to mix and evenly space fibers, and treadle and spin yarn. Mack commented, “Goat is softer than alpaca.” Beckett shared, “I know how to make yarn. You take a piece of wool and wet it a little and roll it and roll it and see here is the yarn! Now I have to dye it!”

Lastly, Garrett answered a variety of children’s questions, including:

How do you make designs? How long do you have to spin? How do you wash wool? Did that wool come from a black sheep? Why do you need to card wool?

In answer to “What color sheep are there?” Garrett said: “There are white or black sheep—all sheep that are not white are called black sheep. The white sheep wear jackets to keep their fur from getting dirty!” Children thought that was funny and recalled a book we had read about a farmer making sweaters of different colors for all his sheep.

Weaving loom
Kathleen Dickey, our visiting weaver, demonstrated how a loom works. While she turned fibers into fabric on a miniature Navajo loom, children asked questions, learned names for the
tools weavers use, and drew pictures of the loom as Dickey worked on it. The children were fascinated to watch the yarn form patterns on the loom. Dickey explained how the Incas integrated mathematics into their weaving, and children noticed patterns and counted in unison with her as she wove. We discussed how her loom was similar to—and different from—the looms we used in the classroom. After she wove, Dickey shared a book about a little girl who learned how to weave from her grandmother.

These visits were wonderful opportunities for children to learn about the history of spinning and weaving. Both visitors shared stories about the process and evolution of these arts. Children were able to experience these beautiful tools up close, and even have a chance to try their hand at it. We heard children re-visit these experiences and compare and contrast the spinning wheel and loom:

Avy: “The spinning wheel also has a treadle. The spinning wheel makes the yarn thin. Weaving makes it fat. Spool yarn on it and you go up and down, up and down.”

Marcel: “Treads are the things you put your feet on and treading is the action.”

Playing sheep doctor

Play is meaningful to children, and the strongest evidence of this is the amount of symbolic play that goes on through childhood. Even children who rarely play together slip into the world of imagination together, with shared understanding. “Finding purpose in play, children commit themselves to it wholeheartedly.” Not only is play purposeful, according to Russian psychologist Lev Vygotsky, but it is also the “source of development,” in which “a child is always above his average age.” Children used the yarn, wool and sheep to create their own dramatic play scenarios.

As Kian checked the model of a sheep with a blood pressure cuff tool, he exclaimed, “Her blood pressure is pumping low, she is going to die. Actually I think she is going to survive another 12 years—she is 12, so when she dies she’ll be 24!” He picked up a tan sheep and said, “The tan one is going to live 13 years, a lot longer than the other. She has clams in her ears, they are biting her. Here I took them out and now she will live 19 years!”

At story time and snack time, we read books related to wool and sheep. These books led to group discussions, the sharing of ideas, and the asking of questions. Some of our favorites were Pelle’s New Suit, Farmer Brown Shears His Sheep, The Mitten, Woolbur and Extra Yarn.

After having many experiences with weaving looms, children came to the woodworking table, where they used yarn and wool to create their own looms in many different styles. Some took their looms home and worked on blankets for their stuffed animals, then brought them back to school to share, fostering a home–school connection. Families were invited to visit Hidden Villa Farm to view wool shearing. Some of our families visited the farm, and children saw the sheep get their annual haircut, cheered hardworking dogs as they rounded up the sheep, and learned how wool goes from shaggy sheep to beautiful sweaters.

The children were excited by their visit to the farm, and after their return to school shared photos and stories about the experience. Elena: “I know when you shear a sheep, it turns into a goat.”

Impact on development

A curriculum like the wool project—where children can engage fully with materials and experiment with them over time—supports their cognitive, emotional, social, physical and language development. These learning opportunities are valuable precursors to the mental processes that later enable reading, writing and mathematical thought. The experience of creating imaginary scenarios fosters oral language, and the ability to talk about their play further contributes to early literacy.

Children learn in different ways, and the wool project provided an avenue for every kind of learner. This kind of synergistic group-learning through wool play enriched the children's experiences. The excitement about wool offered an opportunity for our group to practice a wide range of life skills that are relevant and valuable for each child’s growth, such as:

- Being intellectually engaged, absorbed and challenged by recognizing their interests and taking initiative.
- Having confidence in their own thinking and questioning.
- Being involved in sustained investigations and extended interactions (e.g., conversations, exchange of views and planning).
- Encouraging others by making suggestions and expressing appreciation of their efforts and accomplishments.
- Applying their emerging literacy in purposeful ways.
- Developing feelings of belonging to a group and identifying with others.
- Knowing the satisfaction and joy that comes from finding solutions to overcome challenges and setbacks.

As the teachers helped facilitate this project, we also embarked upon our own educational journey through observing, listening and documenting—related not only to the project topic but to how children learn.
“Look, teacher, we made a fort and my friends are back there!”

Hideouts in the East Room yard began in the bamboo forest and under some tall bushes near a fence. These spaces became meeting places for small groups of peers, where many discussions took place about the next steps in their play scripts. “Let’s make traps for the tigers!” “I’m a lion. You are the mommy lion. She’s the sister lion. What do you want to be?” The play evolved over time, and the spaces became more elaborate. “We need blankets!” Teachers provided blankets in many areas of the environment as requested. Children used the blankets with block structures, trees and climbing equipment, and “pirates” used them to transform our fishing boat into a wondrous structure with a sail, places to sleep, and protection from the “bad guys.” Groups decided together where they would sleep on the tent-like boat, where the food would go, and how long it would take. What else did they need? They collected planks to create seats in the boat, added food and water for the trip, and decided where each person would work and rest.

Others made hideouts of a slightly smaller scale. One child began placing large blankets over a climbing structure. Red boards were moved to create many attached levels. He asked a nearby teacher to help him move the heavy boards. “Look, teacher, I made bunk beds! Now we need a blanket over us!” A blanket was placed over the structure in a tent-like way, and he crawled in to try out his new place. “This is great!” He called out to some children nearby, “Come in! Come in! I have bunk beds. You can go there! You can come in, too! I have room on my bunk bed!” Two more children joined him. Sounds of soft snoring ensued, followed by gentle laughter as the children enjoyed this new space. Other children brought blankets to create new spaces within the redwood trees. These enclosures became tranquil areas to quietly read a book or talk with a friend.

Fort building benefits children in many ways, including socially. Children cooperate as they negotiate the planning and building stages of a fort. They practice compromising and giving and taking instructions. They bond together in these spaces, often creating secret passwords to get in and rules within the new space. We saw teamwork at play as children attached multiple blankets to construct a fort—one child held the blanket in place and another helped to secure it. After settling in, the children agreed that they needed a water break. They asked a teacher to keep an eye on their hideout while they ran to get water and rushed back to their play.

Fort building also exercises children’s cognitive skills as they plan, solve problems, and use their imaginations. At the same time, it encourages creativity as they try out their ideas, and it helps them develop their spatial reasoning skills. Physically, fort making takes a lot of work! I have heard many sighs during the process of building a hideout. Building one of the large hideouts required a lot of “heavy work,” as children brought over benches and blocks for tables and beds.

Fort building also encourages emotional well-being, as children can make a small, quiet space to relax and feel in control of their surroundings. The energy changes—the voices become quieter and the pace slower. High-energy play becomes more focused and sustained as roles are chosen, rules are made, and spaces within the smaller space are labeled for a specific purpose. Children feel ownership over their surroundings and within their space. They feel proud of their buildings: “We made that! Do you want to come in after snack time?” Lastly, these special places created by children encourage independence and build confidence, and they can be a stress-release as the children create their own space where the world is suddenly theirs to control. And let’s not forget—fort making is FUN!
Introducing Circuits in West Room

By Nichole Baumgart and Andrea Fewster, Teachers

I’ll work through the night to create a design—
Constantly analyze, tweak, and refine.
I’ll study jet rockets and look at old planes,
Contemplate buses and zeppelins
and trains ... So sit back, relax,
stay right where you are. It’s time
to reveal my spectacular car!

—if I Built a Car, by Chris Van Dusen

Bing Nursery School has a long-standing tradition to support children’s learning through play by using five basic, open-ended materials: blocks, clay, paint, water and sand. These materials help children learn more about the world around them and about themselves. While preparing for the spring quarter, the West AM and PM teaching teams worked together and wondered how we could introduce circuitry concepts and materials to this framework. How would children gain a stronger understanding of the technology, its application and its uses in their play?

Through observations, the teachers recognized that the children were interested in circuits and that their play interests afforded many opportunities to connect with circuitry concepts. For example, the children were building their own robots and spaceships, both simple and elaborate, as woodworking projects. Children’s dramatic play included many pretend digital pieces of technology, such as cell phones and cameras, and they even talked about some of their experiences with building circuits at home. For example, one child manipulated a circuit kit at home with her older sister to create a scribble robot. On one occasion, the children wanted to create a night light for their dark tiger tunnel, which they built out of large hollow blocks. Opportunities like these further established a direct connection to how circuits could be useful in their play. At the same time, the children were drawn to books that centered around inventions, such as Chris Van Dusen’s If I Built a Car, and the teachers noticed that many of the themes in these books also surfaced in their pretend play. Given this information, the teachers aspired to expand upon the children’s interests and their own teaching practices by investigating circuitry concepts with very young children.

The discovery table served as an ideal space for introducing and highlighting these new materials, as it is often the first thing that children and their families notice on arrival. Designing a minimal yet captivating setup of the circuitry materials, the teachers hoped to draw the children’s attention to the table and promote self-directed exploration and manipulation of the component parts, including wires, conductor pieces, switches, lightbulbs, battery packs and a motor. Pictures of possible configurations were provided to guide the children in their building and to enhance their understanding of the parts of the circuit, but children were offered time and space to experiment with their own designs and demonstrate their creativity with the material.

Initially, the teachers observed the children using the circuit pieces as yet another building material in the class, by stacking the connector pieces, building perimeters around the circuit boards or creating elaborate designs of various shapes and heights. Once the children began to understand the capacities of the circuit boards on a deeper level, however, they began to focus more on the functionality of the system rather than its design. The children explored and tested setups of increasing size and complexity, gaining an impressive level of proficiency in their designs. One day, a child in West PM designed a system that spanned two circuit boards in which a lightbulb and a fan were controlled by a single switch. Intrigued by his machine, a younger child who was new to the class approached the table and watched for a while as he operated the circuit. After a period of observation, the younger child then contributed her own idea for the machine by gently touching the fan while
it was spinning, causing it to fly up into the air. Clearly delighted with her discovery, she invited the builder to try it himself: “That was cool. Do you wanna try it?” This initiated a shared experience with the circuit boards that offered the children an opportunity for social collaboration, hypothesis-testing and the joys of discovery.

As the children developed increased expertise with the circuit boards, the teachers introduced new materials to expand the children’s thinking and experiences. Children began using simple circuits comprising LED lights and watch batteries in addition to the original circuitry materials that were presented at the discovery table. The children used their LED light and watch battery circuits to illustrate their ideas in their dramatic play and art expressions. For instance, one West AM child created a ski map that represented a favorite family skiing resort, complete with green and red light circuits to indicate whether the ski lift should go or stop in her drawing.

On another day, the children created simple motor circuits commonly known as a scribble robot. Teachers based its construction on the basic motor circuit components being explored at the discovery table—small motor, wires and battery packs—which the children then coupled with repurposed containers, tape and markers. The children’s first scribble robot structures were composed of markers as “legs,” and container-shaped bodies that were holding up the motor circuit above. Children witnessed the effects of changing their designs by adding a piece to the motor’s shaft to make their scribble robots shake, and by connecting the circuit wires to turn the robot circuits on and off. These experiences went beyond the discovery table’s basic on/off configuration with switches. Interestingly, the children brought their own perspectives and extensions to these experiences while engaging in the process of making their scribble robots. Alec suggested, “We need lights for its toes, too. The toes are right here by the markers. I’ll make some.” They then included many more simple LED lights and watch battery circuits on their scribble robots, so that the robots could have multiple eyes and toes.

The children began to see the circuits as another material or tool for their typical interactions in the classroom. It was wonderful to witness the children gain a sense of empowerment through technology at such a young age. They actively created their own inventions by using electric circuit materials in their play. Because the children saw themselves as capable circuit users, they were able to find ways to incorporate ideas from other people’s inventions. A parent from the West AM classroom, who is a Stanford professor of mechanical engineering, shared some of his own and his students’ inventions with circuits and common materials. The children saw how they used common materials like rubber bands, plastics and boots to build exoskeletons to help people walk. And the children watched simple circuits cause objects to jump into the air, and they were able to relate these more complex inventions to their own creations.

Upon reflection, the West Room teaching teams learned that circuit boards offered a wide scope of experiences to the children and afforded multiple levels of involvement in their exploration. Children learned about the basic concept of a circuit and took an active role in designing their own systems. While some children enjoyed the opportunity for independent experimentation, others worked collaboratively to design and test their machines, eagerly sharing their ideas and their observations with their peers. Simultaneously, many parents and family members were also actively involved in the children’s learning at the discovery table, offering insights from their own experiences with circuits and enjoying the opportunity to share expertise from their professional fields. The teaching teams gained a deeper understanding of the power of circuits to promote children’s cognitive and social growth by affording open-ended opportunities for hypothesis-testing, creative design and collaboration. We wonder how the children will continue to build on their understanding of electric circuits, and how they will implement these skills in their future.

Editor’s note: Nichole Baumgart coauthored STEAM Concepts for Infants and Toddlers, published in July, with Linda Kroll. [STEAM is an acronym for science, technology, engineering, arts and mathematics.]

A Stanford engineering professor and parent shares with children how his students’ simple-circuit jumping machines work.
The Bing Times

STAFF DEVELOPMENT

Fall Staff Development Day
By Mischa Rosenberg, Teacher

On Oct. 9, 2017, Bing staff gathered in the Tower House for fall staff development day. The day included presentations from Stanford researchers and Bing staff about challenging play, children’s concepts of social groups and childhood emergent stereotypes about gender and intelligence.

Teacher Lars Gustafson and head teachers Todd Erickson and Peckie Peters kicked off the day with their presentation, “‘Is this okay?’ Exploring the value of challenging play themes.” The talk offered insight into the inestimable benefits of individual and group play where children are able to take risks, whether scaling the dome climber for the first time or engaging in “rough-and-tumble” play fighting with classmates. The presentation emphasized the importance of establishing meaningful connections both between teachers and children and between teachers and caregivers. These relationships establish an understanding of each child as a unique, competent individual with a great capacity for physical, intellectual, social and emotional growth. Though challenging play may spark a degree of nervousness in adult observers, it is a normal part of childhood that can be foundational for resilience and confidence building. Children develop skills that are transferable to their present and future lives, including social competency, self-regulation, perspective-taking and problem-solving. Bing teachers have presented a similar talk at conferences for educators, such as the National Association for the Education of Young Children and the California Association for the Education of Young Children.

Lin Bian, a postdoctoral scholar at the Stanford University Department of Psychology, then presented “‘Who is really really smart?’ The early-emerging gender stereotypes about brilliance.” Bian discussed gender disparities in academia and how they are related to children’s ideas about “natural intelligence” or “brilliance.” Her research examines gender-related stereotypes about intelligence as well as how these stereotypes affect male and female children’s choices in activities. Bian has been conducting research at Bing. See page 7 for more information about her research and findings.

Steven Othello Roberts, an assistant professor of psychology at Stanford, presented his research on how children understand social groups. He focused specifically on two domains: concepts of racial stability and group norms. In the first domain, Roberts investigated when children begin to understand that race remains stable over time. In the second domain, he explored how children’s interpretations about social groups are related to descriptive norms (how things are) and prescriptive norms (how they infer things should be). Roberts is also conducting research at Bing. See page 6 for more information about his research and findings.

Winter Staff Development Day: Fostering Creativity and Innovation
By Kathryn Carruthers, Teacher

“We all start out as innovators, and we lose that somewhere along the way,” Bing’s associate director Beth Wise quoted a speaker she heard at a Learning & the Brain conference on creativity in February. These words set the tone for Bing Nursery School’s winter staff development day, where Bing educators focused on the challenge of fostering creativity and innovation in the minds of both children and teachers. This full day of presentations and discussions took place on February 20, 2018.

The day began with a presentation from Kyung Hee Kim, author of The Creativity Challenge: How We Can Recapture American Innovation and a professor and researcher from The College of William and Mary. Her presentation focused on her passion and area of expertise—creativity and innovation. She began by explaining the problem: While creativity and innovation are at the forefront of American growth, the United States has become a nation that relies on test scores to determine a child’s future. She believes that “education should empower children to reach their maximum potential in the area of their own curiosity and interests.” When there is more focus on memorizing information in order to improve test scores, children’s passions, strengths and creative potential fall victim.

Our job as parents and teachers is to help children develop their strengths by focusing on individual curiosity. This is one reason why unstructured time with open-ended materials is so critical to the philosophy at Bing. Kim’s research suggests that all the common characteristics
that big name innovators possess can be taught or cultivated, and that a creative attitude needs to be encouraged more than academic excellence. To do this, Kim encourages parents to focus on the unique strengths of children.

Kim realized that there was a creativity crisis after studying over 200,000 test scores from the Torrance Tests of Creative Thinking. She gathered scores from American and Canadian children and adults tested between 1966 and 2008. Her analysis found that creativity scores of Americans rose from 1966 until 1990, but began to significantly decline after 1990, even though IQ scores continued to rise. Creativity is declining, and Kim recognizes that something must be done. She created the CATs method (climates, attitudes and thinking skills) to help parents and caregivers nurture creative attitudes in children.

Kim spent the majority of her talk discussing her CATs method. The “climates” in CATs are similar to an environment, but refer to both the physical and psychological surroundings. The “attitudes” are the practical attitudes that are nurtured by the climates. The “thinking skills” describe the actual creative process that is enabled by attitudes. They include “inbox thinking,” “outbox thinking” and “newbox thinking”: Inbox thinking is the traditional way of using a reservoir of knowledge to solve a problem, outbox thinking is divergent and unique ideas, and newbox thinking combines the expertise from the inbox and the novelty from the outbox to create innovation. With the climates and attitudes in place, one can work through the thinking skills to become a true innovator.

Kim’s discussion of climates gave Bing teachers new insight into how a nursery school environment can influence children’s creativity. Kim’s climates can be likened to an orchard: Just like plants, creativity needs “diverse soil, bright sun, fierce storms and free space” to grow.

The diverse soil climate suggests that children need “diverse resources and experiences” to flourish. It encourages resourcefulness, so children can learn to pull from the people around them to create their own viewpoints. There are five attitudes that accompany the soil climate: open-mindedness, bicultural, mentorship, complexity-seeking and resourcefulness.

The second climate is the sun climate. Just as sun attracts plants to grow in a certain direction, the sun climate encourages children to be inspired and curious. There are six attitudes that fit into the sun climate: optimism, big-picture thinking, curiosity, spontaneity/impulsivity, playfulness and energy.

Third is the fierce storm climate. This climate provides children with challenges and high expectations. “The storm climate provides both positive and negative feedback to instill self-discipline and self-efficacy in individuals.” The attitudes that accompany this climate are: independence, self-discipline, diligence, self-efficacy, resilience, risk-taking, persistence and accepting uncertainty.

The fourth climate is the free space climate. In this climate children are “given the freedom to be alone and unique.” Just as all plants grow slightly differently, even in similar contexts, the attitudes in this climate encourage a child to be truly themselves amidst their surroundings. The attitudes are: emotion, compassion, self-reflection, autonomy, daydreaming, nonconforming, gender-bias-free and defiance.

Kim’s presentation left us with new tools and motivation to foster a child’s most critical skills in discovering their own interests, passions and developing strengths.

Following Kim’s inspirational presentation, teachers Sadie Parrinello and Frannie McCarthy shared innovative ways to represent children’s interests and experiences through documentation with photographs and videos. They reminded us how reflecting on a child’s play, art, movement and conversations can help us recognize how we can enhance their experiences. As teachers, we can extend learning when we more fully understand how children experience the world around them.

These ideas, together with Kim’s, further inspired our teachers to help children grow their creative potential, so they can feel as important and as valued as we know they are. (More information about the CATs method is online at bingschool.stanford.edu/bingtimes.)

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**Observational Drawings from Cooking Project**

- **Oat raisin biscuit. By Julian A., 4 years 6 months**
- **Waffle. By Ava T., 4 years 5 months**
- **Banana bread. By Sterling C., 4 years 7 months**
- **Star-shaped pretzel. By Forrest C., 4 years 7 months**
This year nine Bing teachers were among the presenters at the 2018 annual conference for the California Association for the Education of Young Children, offering five workshops on a variety of topics. The conference, held April 19–21 in Pasadena, had 1,330 participants. Following are synopses of the Bing presenters’ talks.

Is This Okay? Exploring the Value of Challenging Play Themes
Presented by Lars Gustafson, Todd Erickson and Peckie Peters

“Challenging play themes” are loosely defined as those that cause adults to feel some discomfort. Some examples of such scenarios include, but are not limited to, climbing to and jumping from heights, chase/retreat games, wrestling and other rough-and-tumble themes, pretend fighting, and good vs. evil.

Adults sometimes become nervous when these themes present themselves because they seem to raise the risk of injury. While we certainly want to keep children safe, children need these opportunities to assess risky situations so that they can learn about their abilities and limitations.

Additionally, adults might see these behaviors as disturbing or inappropriate, as we may have witnessed real violence in person or in the media, but it’s important to keep in mind that children may be seeing them very differently. Such actions lend children a sense of power and of control, which they rarely experience in their regular lives. They can only meet such needs through physical peer interaction. Rather than telling children they can’t play, adults can be supportive allies who ensure there is no intent to actually harm others.

When challenging play is taking place, an adult should consider the ages, experiences and personalities of the children involved before taking action. For example, a 3-year-old might feel brave after jumping down one step, but a 5-year-old might be ready to try jumping from a height that matches his or her own.

A Gift of Time: Giving Back to Children What Modern-Day Society Has Taken Away
Presented by Parul Chandra and Nandini Battacharjya

This presentation highlighted the value of blocks of uninterrupted time for children to follow their interests. One benefit of ample time for children to engage with the environment and peers is that it encourages their ability to sustain focus. These blocks of time enable children to engage in tasks that have continuity through meaningful short- and long-term projects, providing them possibilities for repeated experiences over time.

Teachers are able to observe children’s learning styles and levels of development in different areas when children have ample time to explore and make discoveries. A stretch of uninterrupted time for play also gives teachers opportunities to hone in on the children’s learning styles by observing and listening as children engage in their work. Furthermore, it provides a chance for children to develop and focus on their genuine interests and allows teachers to show respect for the children and their work. Through this gift of ample time, children can recognize their own agency in their learning process, which in turn helps them feel valued and encourages them to become active and invested learners.

This “gift of time” is a gift to children, teachers and parents. It provides opportunities for choices of both child-initiated and teacher-led activities, such as story time, sharing time, circle time—children can learn to attend to a group. We believe that children—even at this early age—are ready for some direct instruction: stories, music, rhyming, pre-reading and pre-writing activities.

Play Counts: Enhancing Brain Development Through Play
Presented by Chia-wa Yeh and Peckie Peters

This presentation explored and demonstrated through video documentation how play promotes young children’s brain development. Hands-on learning is invaluable as young children make sense of the world around them. During play that engages different senses, such as sight, sound and touch, young children make important neural connections at a critical period of their lives. These connections are optimally made through repeated experiences.

Excerpts of an interview with Jamshid Ghajar, Stanford clinical professor of neurosurgery, provided the theoretical foundation. Ghajar stated: “During the first five years of their lives, children have a biological drive to play.” During play, the cerebellar brain cells make connections that establish predictive timing in interactions, which is essential in taking in information and anticipating what to do next, such as determining when to hold out hands to catch an incoming ball. “Without play and making those cerebellar connections, children can’t learn and interact efficiently,” Ghajar said. Exposure to a wide variety of play experiences, such as painting, climbing and digging, enables the motor and
sensory areas of the brain to interact with each other and synchronize.

The significance of children’s ability to cross their arms and hands over to the opposite side of their body, a movement known as midline crossing, was highlighted. Midline crossing is critical for children in early childhood when they develop handedness (a dominant hand) for writing, and later, for reading—when their eye muscles are able to visually track across the midline so they are eventually able to read across a page. Activities that facilitate this development include wiping tables, painting on large easel papers and sweeping.

Choosing Quality Children’s Books for the Early Childhood Classroom Setting
Presented by Nancy Verdtzabella and Nichole Baumgart

In this interactive workshop, participants gained knowledge about 1) criteria that are essential for choosing quality books, 2) resources available for creating a children’s library on a budget, and 3) developing a deep appreciation for the care of books and their content, and how to share this appreciation with children.

The presenters shared information on how to select the appropriate literature for the participants’ classroom setting. Important factors to consider are whether the book’s length and content are age-appropriate. Rich content and a variety of illustration types with multicultural characters were also emphasized in order to represent the families in the school community and globally. Importance was also given to creating a library with a broad range of subjects and genres in order to support the variety of interests and learning styles children possess.

Audience members joined in a discussion, reflecting upon their own experiences and the experiences of the children they interact with. Participants also had the opportunity to look through a collection of quality books suitable for story time.

By the end of the workshop, participants were able to identify a variety of ways to create a literacy environment that supports cultural diversity, strong language acquisition and a variety of learning styles.

Play-based Learning in the Common Core Era: Supporting Common Core Through Play With Basic Materials
Presented by Jenna Rist

Play, especially free play, is vital to life and learning. This belief is often viewed as being at odds with the need for teachers to address specific standards in elementary school. However, children’s play and natural exploration take them further toward reaching these educational goals than most realize. Through self-directed play, children at Bing learn foundational skills that they will use in kindergarten to meet the California Common Core State Standards.

The presentation provided examples of children’s learning through using five basic, open-ended materials—blocks, clay, paint, sand and water—at Bing. When given the time, space and materials to explore, children will seek out learning opportunities and advance their literacy and mathematical thinking skills independently. They are motivated to solve problems and make discoveries. The examples given in the presentation show children’s capacity for advanced thinking and reasoning when teachers support their exploration and extend it through repeated experiences with the same materials. For more information, see an article on this topic in the 2017 Bing Times at bingschool.stanford.edu/bingtimes.

NAEYC Annual Conference
By Andrea Fewster, Teacher, and Emma Vallarino, Head Teacher

This past November, the National Association for the Education of Young Children held its annual conference at the Georgia World Congress Center in Atlanta. The director of Bing Nursery School, Jennifer Winters, and a group of six teachers had the opportunity to represent our school at the conference and draw inspiration from the hundreds of sessions that were offered. Teacher Lars Gustafson was a panel participant and presented the research he carried out while earning a master’s degree in education at San Francisco State University.

The range of topics addressed at the conference was immense, but each session provided a thought-provoking discussion of an issue related to the field of early childhood education, from how to most effectively document children’s learning in the classroom to promoting the tenets of social justice among young children. The Bing teachers welcomed the opportunity to draw inspiration from our colleagues in the field, and we took time at the end of each day to come together and reflect on both the content of the discussions and our own teaching.
practices at Bing. Following are two highlights from the conference:

**The Power of Intention: Reconsidering Everyday Early Childhood Practices**

One session that related particularly well to the work that we do at Bing introduced the concept of a “complementary curriculum” and addressed the importance of teaching practices that are thoughtful and purposeful. The panel of presenters from the Henry Frost Children’s Program in Massachusetts discussed the advantages of incorporating elements from a variety of pedagogical models when developing a child-centered curriculum, including those based on Lev Vygotsky’s theories and Reggio Emilia and Montessori methods. The presenters asserted that “discovery and explicit instruction can and must co-exist” in the classroom, and that teachers should follow children’s naturally emerging interests when designing a curriculum. They highlighted the benefits of providing children with opportunities for open-ended, self-directed exploration with new materials, paired with structured moments of explicit instruction and support from teachers as children master new skills. At the heart of every effective curriculum, the presenters argued, there must be unconstrained access to “compelling materials” that children can explore in both creative and concrete ways. When arranged and organized by teachers in an engaging manner, these materials can provoke experimentation, hypothesis-testing and collaboration among children.

For instance, the presenters offered an example from their program in which children expressed an interest in learning about pipes after seeing one of the school’s sinks overflow. The teachers subsequently planned a curriculum around the theme of “pipes”—inviting a plumber to visit the class, introducing new tools and terminology, and providing large cardboard tubes and balls with the intention of inspiring the children to create their own pipe system in the classroom. By following the children’s emerging interests, the teachers designed an engaging curriculum that offered scope for both self-directed experimentation and direct instruction, with the goal of fostering a deeper understanding of the subject. Open-ended activities were supplemented by teachers’ instructions on how to use new tools (e.g., pliers) or materials. The presenters also stressed the importance of creating spaces for a wide variety of learners in the classroom, such as setting out thematic materials across the various play areas of the classroom and allowing opportunities for solitary and group work. By providing opportunities for choice, the teachers enable children to engage with the materials in a way that meets their level of development and learning style. This careful attention to the needs of each child in a class seems particularly relevant to Bing’s mixed-age program, where we strive to create a curriculum that will be inspiring and accessible to a wide variety of learners.

**Reflective Practice to Support Playful Inquiry and Emergent Curriculum**

Another presentation that stood out was by former Bing teacher Sarah Felstiner, curriculum director at the Hilltop Children’s Center in Seattle, Washington, a preschool and pre-K program serving children ages 2 to 5 years old. In this insightful session, Felstiner presented how reflective practice supports playful inquiry—in other words, inquiry-based learning in a play-based environment—and emergent curriculum: curriculum planned by following the children’s interests. Reflective practice is the process in which teachers consider the children in the environment with care and take the time to reflect upon their learning and development, engage in the process of inquiry, and plan for future play experiences in the environment. Felstiner walked the group through the structured practices that have been put in place at Hilltop to support reflective practice among the staff, a practice that leads to rich and thoughtful inquiry, emergent curriculum and in-depth parent engagement.

Essential to this process is the children’s play environment. As at Bing, the play environment is seen as another educator in its ability to support learning and development as children engage with it, often without a teacher. The play environment is also a space that allows teachers to see how children explore. It shifts the teacher’s role, such that the teacher is able to step back and learn about children by observing them engage with the space and materials available to them. These spaces are curated to be aesthetically inviting, offer learning opportunities for children, and support exploration. Felstiner described the elements of a “reflective environment” as follows: areas that encourage group work, a “less is more” mentality, open-ended materials, natural and inventive materials, aesthetic appeal and interesting setups to spark new ideas. Their play environments showed spaces that included decorative metal trays and wicker baskets (acquired at thrift stores) to display materials, glass jars full of interesting art materials organized by color that are aesthetically pleasing and invite children in to use them, and open-ended materials such as large wooden tubes and cardboard boxes included in the space to encourage large group collaborative play and exploration. The environment offers children interesting and inviting activities that are developmentally appropriate and encourage growth and development, yet do not need a teacher to lead the activity. This allows teachers to support children who do need help, to offer guidance as needed, and also, importantly, to reflect on the children’s play and development by taking observational notes and documenting the classroom experiences. It was inspiring to hear about the thoughtfully curated and designed spaces for play at Hilltop.
Felstiner highlighted an idea that Deb Curtis, Debbie Lebo, Wendy Cividanes and Margie Carter advance in *Reflecting in Communities of Practice*: “For reflective teachers, work is an ongoing process of closely observing and studying the significance of unfolding activities … to better understand and delight in what happens in the classroom.” As teachers engage in deep reflection through reflective protocols, team meetings, mentor teacher support, ample planning time, cooperative assessments with families, and connecting to broader communities of practice, they work to ask new questions about children and their ideas, guiding a more responsive curriculum. The intentionally designed space for children is the foundation for reflective practice in the school. It allows teachers to be able to observe and document the learning that happens every day in their classrooms, and then share that learning and the children’s ideas with the school and the parents. Creative projects have emerged from classrooms—such as when a group of children built a cardboard rocket ship—that were documented and then shared with a group of parents. These parents were awed and surprised by the deep thinking and creativity that happened in the classroom. The reflective work the teachers were able to do highlighted the competencies of the children.

Felstiner highlighted an idea that Deb Curtis, Debbie Lebo, Wendy Cividanes and Margie Carter advance in *Reflecting in Communities of Practice*: “For reflective teachers, work is an ongoing process of closely observing and studying the significance of unfolding activities … to better understand and delight in what happens in the classroom.” As teachers engage in deep reflection through reflective protocols, team meetings, mentor teacher support, ample planning time, cooperative assessments with families, and connecting to broader communities of practice, they work to ask new questions about children and their ideas, guiding a more responsive curriculum.

The conference included tours of the Cyert Center and the Children’s School, both at Carnegie Mellon University, and of the University Child Development Center and the Falk Laboratory School at the University of Pittsburgh. The final day of the conference offered presentations on topics ranging from leadership to creating and providing optimal learning environments for young children.

A secondary goal for the Bing staff attending the conference was to meet with the planning committee in preparation for the IALS International Tour’s stop at Bing Nursery School on October 24–25, 2018. Bing will host a group of 20 teachers, administrators and professors, traveling from Columbia University, Carnegie Mellon, University of Pittsburgh, Northwest Missouri State, University of Toronto, Japan, Germany, Beijing and Halifax, Nova Scotia. They look forward to a tour of the school, presentations by Bing staff, a research presentation, and shared dialogue between educators about the mission and future of their laboratory schools. When we connect with the greater community of educators, we learn more about the work of other schools and reaffirm the commitment we have to quality education for young children.

For a lifetime love of learning, children need a foundation of intellectually engaging experiences and the freedom to discover, invent and explore. This was a key message from this year’s conference for the International Association of Laboratory Schools. The conference, which was held May 2–4 in Pittsburgh, brings together staff from laboratory- and university-affiliated schools engaged in teacher training, curriculum development, research and professional development.

Two Bing staff members were among the more than 300 national and international participants attending the conference, and Bing teacher Jenna Rist was one of the presenters, giving a talk titled “Play-Based Learning in the Common Core Era: Supporting Common Core Through Play with Basic Materials.” (For more information, see page 29)

A cat. By Sarah L., 4 years 2 months
A cat. By Zaara G., 5 years 5 months
By Skye B., 5 years 8 months
“Blurring boundaries” was the theme of the most recent biennial Nueva Innovative Learning Conference, which was attended by several Bing teachers. The theme of the conference, held October 19–20, 2017, at the Nueva School’s campus in Hillsborough, California, prompted speakers and breakout sessions to explore what it really takes to create impactful learning experiences that transcend traditional boundaries in education. The conference explored topics that ranged from creative and critical thinking to equity and social justice. Experts from the field of behavioral biology spoke alongside experts in design thinking. The intention to “blur boundaries” was clear in the variety of speakers and topics available throughout the day and was inspiring to consider in the context of early childhood education.

A More Beautiful Question

To begin the day, Warren Berger, a leader in design thinking and innovation and self-proclaimed “questionologist,” highlighted the need for our educational world to embrace questions, saying “within problems and questions there are opportunities.” These are opportunities to learn, to be creative, to challenge the status quo. Berger revealed that children on average ask about 40,000 questions between ages 2 and 5 years of age, and that the peak questioner is a 4-year-old girl who asks on average 300 questions a day, mostly directed at her mother. Questions at this age are pleasurable, says Berger—they are the expression of curiosity, an essential learning skill.

What happens at age 6, then? Questioning declines after these early years, and Berger argues that we must fight against the forces that make questioning disappear. Our educational system changes how children are asked to think. They start to believe that to learn is to learn facts and knowledge, not to ask questions. Berger argues that the skill of questioning should be part of classrooms and should be celebrated. The future of innovation lies in our ability to see beyond what we “know” and further explore accepted beliefs to see what we don’t know. Berger encourages students not only to ask questions but to take ownership of their questions and pursue their questions, as they are the path to innovation.

Berger said his three favorite questions are “why…?” “what if…?” and “how…?” because these questions allow one to understand the problem, come up with ideas and imagine new possibilities, and start solving the problem. Berger has done extensive research in the business world on the factors common to successful companies, and much of his research shows that questions and challenging the status quo are at the center of a successful modern business. Successful leaders of today and the leaders of the future are ones who lead with humility and confidence. We must teach our children to learn these skills early. The children at Bing are in their prime years of this learning, so let’s not deter these beautiful questions—let’s find a way to keep them coming for many years to come.

Wired to Create: How Experience and Environment Matter in Children’s Creative Development

In this lively session, Elizabeth Rood, director of the Center for Childhood Creativity at the Bay Area Discovery Museum, took a deep dive into the world of creativity. Her presentation highlighted the importance of creativity in the lives of children and how to support its development in children of all ages. The focus was specifically on how experiences and environment play a key role in developing children’s creativity. She walked us through what she considered the important aspects of creativity development—child-directed, risk-friendly, exploratory, active, time for imagination, and exchange of ideas. She spoke about each of these in depth. Highlighted here are two of her main ideas:

“Child-directed” was the first aspect that Rood discussed, noting that this process must be guided by the child for it to be successful. In a 1962 article published in the Journal of Experimental Psychology, professor Sam Glucksberg showed that extrinsic motivation actually diminishes efficacy in creative problem-solving tasks and adds stress to the process. Instead, supporting children’s intrinsic motivations and giving them time to explore allows them to enter a flow state and increases creative problem-solving. Mihaly Csikszentmihalyi discusses this in his 1990 book, Flow: The Psychology
MEET MARA BECKERMAN, BING MUSIC AND MOVEMENT SPECIALIST

Bing Nursery School welcomes its new music and movement specialist, Mara Beckerman, this fall. The music and movement specialist helps foster an environment that stimulates creativity and promotes an appreciation and love of music. Mara will rotate through the classrooms daily, introducing new songs, helping children discover how to use instruments and explore movement through music, and facilitating children’s songwriting and dramatic play. Mara will also maintain and acquire resources for teachers to use during music time, and work with teachers to plan and extend their curriculum ideas for music activities.

Mara grew up in New York City, and has been involved in the performing arts since she was 8 and began playing guitar at 11. In college, she studied theater and worked part-time teaching music and dance at a small private elementary school. After college, she began performing professionally in musical theater in NYC, in regional theater and on national tours. She was nominated for a Drama Desk Award for Best Actress in a Musical. She has also performed nationally as a storyteller and has recorded three CDs of songs and stories.

In 1991, Mara began working with The Wolf Trap Institute for Early Learning Through the Arts, which places performing artists in preschool classes to help children ages 3–5 and their teachers use the arts to enhance the curriculum.

In addition, Mara has been an active member in the Children’s Music Network since its creation in 1990. “CMN is a wonderful organization for anyone who has an interest in music for children, whether you are a performer, teacher, librarian or parent,” she explains. Mara will be presenting a workshop on creative movement for young children at the CMN National Conference in Cleveland in October.

Mara comes to Bing from five years as the music and movement specialist at Harker Preschool in San Jose. Previously, she has taught music and movement at a number of Bay Area elementary and preschools.

Mara lives in the Bay Area with her husband and has two daughters and a rescue dog named Tofu.

CHILDREN’S DESIGN OF NEW GAMES FOR THE BING CHILDREN’S FAIR

If you were having a fair for children, what new activities would you have? How many tickets would your activity cost?

Smell the flowers (6 tickets). By Maddie D., 3 years 8 months

Petting zoo (1 ticket). By Paige E., 5 years 1 month

Plane rides (122 tickets and 412 tickets). By Eugene C., 5 years 4 months

of Optimal Experience, where he defines flow as “a state in which people are so involved in an activity that nothing else seems to matter; the experience is so enjoyable that people will continue to do it even at great cost, for the sheer sake of doing it.” Rood emphasized that guided play, where experiences are adult-initiated but child-directed, is key.

Another important part of supporting creative development is the idea of “exploratory learning.” Rood sees play as hypothesis testing: “When children mess about with things, they are exploring cause and effect and learning about the natural world around them.” She mentioned that hands-on learning boosts engagement and offers opportunity for divergent thinking. Divergent thinking is a process where many ideas are generated to solve a problem, as opposed to convergent thinking that asks for a specific solution to a problem. Exploratory learning supports creative development by offering opportunities to think divergently. During these hands-on learning experiences, adults can offer open-ended prompts, such as “I notice…,” “tell me more…” and “I wonder…” to encourage divergent thinking.

Rood’s ideas in this presentation align with Bing’s philosophy. Our child-centered environment, with a focus on time for play, deep exploration and hands-on learning is key to children’s learning and development. What Rood is arguing for, though, is that this type of learning should not stop at age 5, but should continue on for the rest of our lives.

If you were having a fair for children, what new activities would you have? How many tickets would your activity cost?

Smell the flowers (6 tickets). By Maddie D., 3 years 8 months

Petting zoo (1 ticket). By Paige E., 5 years 1 month

Plane rides (122 tickets and 412 tickets). By Eugene C., 5 years 4 months
Kindergarten Information Night: Making a Smooth Transition to Elementary School

By Maryam Saqib, Teacher

Kindergarten Information Night is held each year at Bing Nursery School to inform parents on how to support their child’s transition to kindergarten. On the evening of Jan. 17, a panel of experts spoke to parents about what to expect during this transition. The panel included Mary Bussmann, principal of Walter Hays Elementary School, Rick Lloyd, a pediatrician at Palo Alto Medical Foundation and four head teachers at Bing.

First, head teacher Adrienne Lomangino discussed the experiences of Bing alumni at the beginning of kindergarten, drawing insights from a recent survey that asked parents how their children felt about kindergarten before and after they started their programs. The survey, developed by Lomangino, included responses from the families of 86 alumni who began kindergarten in the fall of 2017. The survey provided information about experiences in 39 different kindergarten programs, both public (72 percent) and independent (28 percent).

The survey found that most of the children were enthusiastic about kindergarten from the start, and those who weren’t quickly adjusted. Before the children started kindergarten, 56 percent were excited about kindergarten, 20 percent were neutral–excited, 16 percent were neutral and 8 percent were somewhat reluctant or reluctant. A couple of months later, however, 65 percent of the children were excited to be in kindergarten, 27 percent were neutral–excited and just 3 percent were somewhat reluctant or reluctant.

Dr. Lloyd then addressed a question he commonly receives from parents of 5-year-old patients: What developmental milestones are typical of a 5-year-old? Lloyd started by explaining how children demonstrate more independence at this age with self-help skills, such as using the toilet, washing hands and putting on their clothes. Five-year-old children also become more expressive in their verbal communication as they start to understand what it means to be happy, sad, angry or afraid. Being able to effectively label their emotions improves their ability to question and negotiate with others. An “ethical sense” is also brewing at this age and children are in the beginning stages of distinguishing between right and wrong.

Next, Bussmann spoke about important values that public elementary schools strive to achieve. “Our focus in kindergarten is really about both academic and social development,” she noted. “We really care about students’ social interactions and being able to navigate their world in a respectful and confident way.” She emphasized the importance of children continuing to develop and use their voices to solve social conflicts. Bussmann assured parents that elementary schools would build on their child’s social and emotional abilities acquired from his or her time at Bing.

Academically, the Common Core State Standards are implemented throughout schools in California. Bussmann described the standards as a way for children to problem-solve and enhance their analytical skills in academic subjects like math, reading and writing. Along with a strong focus on academic subjects, Bussmann believes that play is still a vital part of a child’s life. “We do spend a lot of time playing, because play is very important—it is still valued in elementary schools,” she said.

Head teacher Peckie Peters also reassured parents that play is a fundamental part of a child’s learning. “What they are doing right now in their play... is preparing them for kindergarten,” she said. She believes that Bing provides children with the opportunity to play and learn from their peers, their teachers, and through a curriculum that is carefully designed in ways that are appropriate for their age and development.

An essential skill for children to practice before entering kindergarten is self-regulation. Head teacher Todd Erickson explained how Bing allows children to focus and regulate their impulses on a daily basis. Erickson believes that Bing strengthens self-regulation skills in children by giving them the freedom of choice to focus on self-directed activities for large expanses of time. Along with freedom and choice of activities, there are structured periods of the day, including 30 minutes of snack time and 15–20 minutes of story time. By engaging in structured and free-choice play throughout the day, children continually have opportunities to improve their self-regulation skills.

Head teacher Nandini Bhattacharjya provided parents with strategies to ease the transition. Bhattacharjya gave an example of her daughter’s experience: Her daughter did not always want to discuss her day at school. However, Bhattacharjya found it helpful to engage in dramatic play or role-playing with her
daughter about what happened during her day. She would pretend to be a child in the classroom, while her daughter would play the teacher, and vice versa. Bhattacharjya said this type of role-playing can give parents insight into their children’s social, emotional and academic experiences at school.

Bhattacharjya also found it helpful to set aside quality time to connect with her child. She encouraged parents to talk to their children while getting them into bed—to have “cuddle time,” as children are often more willing to share stories and experiences at this time. This is a great way to gain more insight into children’s adjustment to kindergarten. At the end, she encouraged parents not to fear or rush the transition, emphasizing a child’s need for time to acclimate to new situations. “Once successful transitions are achieved, they are very rewarding,” she added.

The panel concluded the night by taking questions from the audience. A common question was how parents should choose between kindergarten, transitional kindergarten (for children whose 5th birthday falls on or after Sept. 2 through Dec. 2 of the school year), or a young 5’s program for their children. The panel strongly recommended that parents speak to their pediatrician to discuss their child’s development. Peters explained that every child is different, and the choices that parents make depend on who their child is as an individual. She said that it would also be helpful for parents to talk to the teacher with whom they have parent-teacher conferences to get a sense of how their child is doing developmentally in the Bing environment.

At the end, Peters reminded parents that it is important to remain in the present moment: “This is nursery school, and this is the time for them to play and to be with each other and trust that they are doing what they need to do … to be ready for that next phase,” she said. “They will be ready for kindergarten.”

### BING NURSERY SCHOOL PERFORMANCE SERIES AND MUSICAL EXPERIENCES

The fifth season of the performance series featured three performances at Stanford’s Dinkelspiel Auditorium: a concert with singer-songwriter Laurie Berkner on Oct. 7, 2017; Gumboots presented by Decoda, the affiliate ensemble of Carnegie Hall, on Feb. 25, 2018; Sleeping Beauty: Aurora’s Wedding presented by the New Ballet School on April 21, 2018. Bing also hosted Latin GRAMMY-winning duo 123 Andrés in Center Room yard at Bing on April 18, 2018.

The series aims to introduce young children to the performing arts. These early experiences open children’s minds, expand their knowledge of different cultures through music and dance and set the stage for a lifelong appreciation of the arts.

Bing teachers and staff also hold informal concerts in the school atrium throughout the year to bring the classrooms together for group singing experiences.
Bing Nursery School held its annual children’s fair this year on Sunday, May 20, 2018. Over 600 families of Bing Nursery School children—current and alumni—spent the day at the school enjoying many activity and craft booths and entertainment, including Sparkle Strings (featuring Bing teacher Tracy Wu), Magical Moonshine Theatre Puppet Show and Stanford Salseros (featuring Bing teacher Tayna Gonzales Rivera). The incomparable Leland Stanford Junior University Marching Band closed the fair and was a huge hit with children and adults.

Over 200 parents prepared goods for the bake sale and the food booths. Cupcakes, brownies and sweets of all kinds were popular, and nobody could pass up the delicious variety of food, from American macaroni and cheese to tacos to samosas. In addition, many businesses made donations, including food and volunteers to help staff the fair, as well as cash. Special thanks to our generous donors: Avanti Pizza, Bird Dog Restaurant, California Pizza Kitchen, The Cheesecake Factory, Dawn Correia, Costco, DAVIDs TEA, Draeger’s Market, Gerry’s Cakes, GNT Group, The Graceful Cookie, Patama & Saar Gur, Ali Hinkie, Jing Jing, Kumar Kittusamy, Las Juntas Restaurant, Brigette Lau & Chamath Palihipitiya, Lulu’s, Nola, Oren’s Hummus, Patxi’s Pizza, Peet’s Coffee, Pizza My Heart, Sophie Rahn, Sigona’s Farmers Market, Starbucks, TaskRabbit, The Market at Edgewood, Tin Pot Creamery, Trader Joe’s, Kristin Vogelsong & Zander Lurie and many Stanford sororities and fraternities.

On the morning of the fair, approximately 200 alumni families joined the Bing staff for breakfast. It was wonderful to see and talk with so many alumni children, as well as their parents, some of whom are Bing alumni themselves.

We would like to thank our Bing Fair co-chairs, Cindy Dodd, Patama Gur, Emily Lopez and Kristin Vogelsong, for organizing a beautiful fair, as well as the over 300 parent volunteers who staffed the activity and food booths this year. Proceeds from the fair benefit the Bing Nursery School Scholarship Fund.

FAIR CO-CHAIRS: Cindy Dodd, Patama Gur, Emily Lopez, Kristin Vogelsong

“Venice at Midnight” was the theme for Bing’s 29th annual Harvest Moon Auction. The event was held Nov. 11, 2017, at the Arrillaga Alumni Center on the Stanford University campus. The annual fundraising event raised over $340,000 for the Bing Scholarship Fund, which provides assistance to over 20 percent of the children who attend Bing. As in past years, Helen and Peter Bing were strong supporters, with a generous gift of $50,000.

As guests arrived, they strolled across a charming version of the bridge over the Grand Canal into the city of Venice. The venue was beautifully decorated with street lamps, gondolas and Venetian masks. Guests enjoyed the “Venetian Sunset” specialty cocktails and came dressed in gondolier and elegant Venetian attire.

More than 600 items were up for bid at the silent auction, and over 100 items were sold through our online auction, where over $20,000 was raised. Bing teachers Todd Erickson and Lars Gustafson, dressed as gondoliers, took the stage as MCs and auctioneers for the live auction, which raised over $58,000. Auction items included a celebration at Bird Dog Restaurant for 12, a weekend in a luxurious St. Helena home, tennis lessons, and making gelato in a park with two Bing teachers. The tennis lessons and the gelato making were so popular that the donors agreed to host a second event. Bing’s own resident carpenter, Gene Aiken, used his creative talents to build a beautiful vintage gelato cart for children, which sold for an incredible $12,300. The ever-popular “Fund a Scholarship”—a live bidding item with straight cash donations going directly to the Bing Scholarship Fund—raised over $38,000 that evening, with an additional $140,000 raised prior to the auction.

More than 40 events for children, families and adults were also auctioned off, including a bread-making party with teachers, a cooking class for children, a pizza-and-movie night for adults, a dads’ poker night, a taste-of-Tuscany dinner, a children’s pizza party and the Bing campout. We appreciate the work and donations of parents in each classroom who put together over 50 class baskets, with themes including “ice cream shop,” “prehistoric fun on the go,” “in the garden,” “let the imagination soar” and “modern art to go.”

The food, catered again this year by Weir & Associates Catering, was in keeping with the theme and featured tomato basil soup, caprese sandwiches, Italian antipasto platters and assorted mini biscotti. Tin Pot Creamery and Peet’s Coffee & Tea donated additional dessert and coffee for the evening, and other business donors included Hengehold Trucks, TaskRabbit, Mount Aukum Winery, The Farm Fund, and Willamette Valley Vineyards. Our generous family sponsors for the evening were the Acton Family, Marissa Mayer and Zachary Bogue, the Xu Family Foundation, Gavin and Joanna Pratt, and Lauren and Michael Angelo.

A big thank-you goes out to our auction co-chairs—Gilda Foss, Margarita Golod and Melissa Miranda—for their vision, leadership and dedication. We couldn’t have done it without them. We are also extremely grateful to our parent volunteers—over 200 strong—who worked on over 20 committees. A special thank-you to those who donated to the auction and to those who attended. The tremendous dedication of our parents, Bing teachers and staff made the auction what it was—a tremendous success!

We look forward to seeing everyone again at this year’s auction on Saturday, Dec. 1, 2018.
Come together on a magical mystery tour and celebrate

**BING NURSERY SCHOOL’S**

30th Annual Harvest Moon Auction  
Saturday, December 1, 2018 at 6:30 pm

You can drive your car, or take a yellow submarine to the  
**Frances C. Arrillaga Alumni Center**  
326 Galvez Street, Stanford University Campus

All we need is love and a little help from our friends. Evening includes food, cocktails and exciting live and silent auction items. All proceeds benefit the Bing Nursery School Scholarship Fund.

Please visit us at bingschool.stanford.edu/hm for reservations and more information, or contact us at harvestmoon@stanford.edu, 650-723-4865

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 değişim: Melissa Miranda, Arturo Pereyra, and Sam Brin  
**Bing Harvest Moon 2018 Co-Chairs**  
Bing Nursery School, 850 Escondido Road  
Stanford University, Stanford, CA 94305