

Learning to Count to ‘14’ the Common Core Way and the Developmentally Appropriate Way

What’s the Difference? Why Does It Matter?

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Scenario #1: Learning to count?

There are 25 kindergartners seated on a rug. The teacher, Janet, puts a pile of wooden craft sticks out and asks, “How many are here?” “20!” Alex responds. Other children repeat in unison, “20!” The teacher asks, “How do you know, Alex?” “...um, I guessed,” he says sheepishly. “No guessing allowed!” Janet admonishes. “Class. How do we know how many we have?” In unison many children respond, “We count.” “That’s right! We count.”

Janet leads the children in counting the sticks, pointing to each one... “1, 2, 3...11, 12, 13, 14.” “How many do we have?” she repeats. A few children respond in unison, “14.” Janet loudly asks the question again, “How many?” This time most children say, “14!” “That’s right,” she exclaims, “there are 14, not 20. Remember, counting gets the RIGHT answer!” She places another stick on the rug. “Now what if I add one more here, how many do I have?” One child starts to touch the craft sticks to count. “No touching!” Janet says, “just pointing!” as she starts pointing and leading the next count to 15. Then, she sends the children to their seats with a worksheet that has drawings of 4 sets of objects [6, 9, 11, and 14]. The children have to count the objects and write the number they get on the line next to each set of objects.

Scenario #2: Learning to Count?

A few kindergartners are gathered at a table, examining some small rocks they brought in from the play yard. Shelley, the teacher, joins them. “My goodness. That’s quite a collection there! How many rocks do you have so far?” Jasmine looks carefully at the rocks and guesses, “I think we have 20!” “Jasmine,” says the teacher, “Did you make that estimate just by looking? How can we know for sure?” Cameron starts counting. He points at each rock as he counts it as others join in. They lose track of which rocks they have counted, starting and stopping a few times. “I am getting so confused,” sighs Cameron. “Hmm. We have a problem,” says Shelley. “It’s getting tricky to keep track. Does anyone have an idea what we can do?” Jasmine grabs a special egg carton used in the past for counting. It has two spaces snipped off so that each side has 10 indentations to hold 10 objects. “We can use this!” she exclaims. The children drop one rock into each space of the egg carton. There are 4 extra rocks. The children count together — pointing as they count. “14!” Jasmine says, “Look, we have 10 here, plus these four...11, 12, 13, 14. We have 14!” Next, Calvin suggests organizing the 14 rocks by size — from biggest to smallest. “Tomorrow we should find some bigger rocks — these are all soooo small!” he observes. He gets classmates to hunt for bigger rocks the next day, and when they are put on the ‘rock table,’ he notices they are a different color than the smaller rocks. He starts sorting all the rocks by color and size, then counts how many rocks are in each group.



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What's Going On?

What themes arise from these two classroom scenarios? What do you learn about the experiences of the children? What about the teacher's role in each? What do you think the children are learning about math? Other lessons?

Scenario #1. Math 'Instruction.' In the scenarios above, we see two very different examples of teaching and learning mathematics in kindergarten. In Scenario #1, the teacher is following her lesson plan, a whole group lesson on the number '14.' She uses 14 sticks, a concrete material which is viewed as important in teaching young children about quantity. She already has clearly taught the children what to do when she asks a question about 'how many' sticks there are (i.e. to count the objects), but Alex does not follow her previous instructions. He 'guesses' ('estimates' in developmental teaching terms) using a big number that he knows (i.e. '20') because he sees there are a lot. But this is not what he is 'supposed' to do for this lesson about numbers of objects. The teacher takes all the children through the one-to-one counting process they are supposed to use to reach the number 14, the 'correct' answer. Then, everyone gets the same worksheet to practice counting, to help them master what they were supposed to 'learn' — the number 14 — in the whole group lesson.

In this 'one-size-fits-all lesson,' any individual efforts to connect to the activity (for instance, a child wanting to touch the sticks as she counts to 14) are not allowed. Similarly, any individual differences in development and thinking in understanding numbers are not a very visible part of the activity. And, once the worksheet is done, the lesson on the number 14 is over, or it feels that way because there are few leads as to what to do next to build onto what the children learned.

Scenario #1 is taking place in a school that places high value on the Common Core State Standards (CCSS). On the CCSS website (www.corestandards.org/Math/), the math standards are described this way:

"Common Core concentrates on a clear set of math skills and concepts. Students will learn concepts in a more organized way, both during the school year and across grades. The standards encourage students to solve real-world problems."

Although this can sound pretty good, the fact is that the solving of real-world problems has been disappearing in many early childhood classrooms in favor of scripted, whole class exercises that are disconnected from real meaning, as we see in Scenario #1 above. As the Common Core

State Standards (CCSS) reach more and more children, we must pay careful attention to how math teaching in early childhood classrooms is affected.

Scenario #2. Learning Math through 'Play.' The math that grows out of the children's rock collecting in Scenario #2 involves much more than getting the 'right' answer. We see a small group of children deeply engaged in activities with the rocks they found outside. The teacher, Shelley, is helping them learn about numbers, counting, and one-to-one correspondence as she asks them how many they have. But she takes the lead from the children in each follow-up question she asks. For instance, when they get confused counting the rocks, she asks an open-ended question: "What will help them solve their problem?" She does not show them how to get the 'right' answer. And, Jasmine comes up with a special counting strategy that worked in the past that she wants to try again, putting objects into an 'egg carton' — one object in each hole (i.e. one-to-one correspondence).

As the children count the rocks, they come up with new ideas. They need more rocks — which will get them counting to even higher numbers — and as the children look for more rocks the next day, they find 'bigger' rocks that are different colors than those they already had. This gives them a new set of math-related problems to solve — sorting and grouping by number, size, and color, and seriating by size — not in Shelley's 'lesson plan.'

Throughout the rock activity, every child's unique ideas are valued as is his level of understanding and interest. They are:

- learning how to plan ahead.
- learning from each other.
- engaging deeply in math learning because of problems they want to solve that grow out of their engagement with rocks, not because the teacher tells them what the math lesson of the day is.

But this activity is more than math; these children are deeply involved in 'play,' and the play process we see is an essential part in math learning in the early years (VanHoorn et al., 2015).

In his white paper, "Common Sense about the Common Core," Allan Shoefeld (2014) writes, "Classrooms that produce students who are powerful mathematical thinkers must provide meaningful opportunities for students to do mathematics." Scenario #2 provides an excellent example of a meaningful opportunity for kindergartners to learn math.

Why Does it Matter?

In Scenario #1, the children are learning math that focuses on getting the 'right' answers, whereas in Scenario #2, the children are learning math that focuses on 'constructing' unique solutions to problems they encounter in the real world with real objects. We know that math concepts that are naturally connected to the real world provide the best experiences for young children (Kamii, 2015; Katz, 2015). A skilled teacher, like Shelley, can harness children's passions by providing quality math experiences and challenges to children through their creative play: counting, comparing, matching, seriating, sorting, adding, and subtracting — plus learning to document their work to share with their classmates and the school community. When given autonomy in the classroom and the appropriate professional training that includes child development, teachers can design a meaningful, interconnected play-based curriculum that includes literacy, science, dramatic play, art, and more. In this type of classroom, math happens throughout the day — just like in life. There may be a distinct 'math time' on the schedule when the teacher develops specific aspects of math with the children, but these teachers still look for ways to bring mathematical thinking and problem solving into all parts of the day. They track progress and document learning to show parents, administrators, and colleagues where their students are in their thinking — and to help guide further instruction.

Unfortunately, in too many kindergartens today, even many of the best trained teachers in play-based, developmentally appropriate practice say they are being pressured into teaching fact-based, 'one-size-fits-all' math lessons and find that play-based activities are severely curtailed, if not banned. This situation deprives young children of the opportunities they need now more than ever to develop a meaningful foundation for mathematical concepts in developmentally appropriate ways (Kamii, 2015; Van Hoorn, 2015). It undermines their ability and enthusiasm to use math to figure out real problems in the real world. And having these meaningful learning experiences with math in school is increasingly important in today's world, as media and technology take up more and more of the time many young children used to spend developing the foundations for mathematical thinking in their own uniquely created, hands-on play activities at home (Levin, 2013). If we want to optimize young children's early math development and learning, we must return to high-quality, play-based activities, where well-trained teachers connect math learning to how children learn and to individual children's interests and needs.

Growing Concern

At Defending the Early Years, we work both to promote appropriate practices in early childhood classrooms and to support educators' efforts to counteract current reforms that undermine these appropriate practices. We are helping to organize the early childhood community to advocate for early childhood practices that utilize what we know about active, play-based learning. More and more well-trained early childhood teachers are recognizing that current school reforms are leading mandates that severely undermine what they know is best practice. We are hearing from increasing numbers of frustrated teachers who have been forced to follow scripted math curricula that align to the Common Core, yet do not allow for developmentally appropriate practice (DAP). Scenario #1 represents but one of the actual math lessons under the Common Core that a concerned teacher sent us asking for assistance. But teachers' concerns about the mandates resulting from the CCSS go well beyond the teaching of mathematics. Teachers are now searching for ways to keep all hands-on, real world learning alive for our youngest learners. They are mourning the loss of opportunity to create emergent curricula based on student interest and the use of appropriate assessments.

Peter Gray has documented this trend on his Freedom to Learn blog in *Psychology Today*. For example, in *K & Preschool Teachers: Last Stand on War on Childhood* (2015), he writes,

"I have spoken in recent months at several conferences of early childhood educators, mostly preschool and kindergarten teachers. At each, I've heard passionate descriptions of struggles to preserve play. They are battling the effects of No Child Left Behind, and now Common Core, which have trickled down from the higher grades to K and preschool. They are battling policy makers who know nothing about childhood, who ignore the piles of research showing the value of play and the long-term harm of early academic training, and who see standardized test scores as the end-all and be-all of education."

What Can We Do?

There is much teachers can do to make the teaching of mathematics to young children more appropriate and effective. Here are a few suggestions that could go a long way to get things going:

- Work to increase their understanding of and ability to articulate how young children learn math and how to further integrate its inclusion into play-based activities.

- Work together to develop a shared strong voice to advocate for developmentally appropriate math instruction. For instance, write and make available position statements like those created by DEY with clear arguments that teachers and policy makers can use to advocate for appropriate practice. Establish support groups with teachers and other concerned professionals to help each other cope with CCSS demands or find ways to resist them, to develop strategies for influencing educational mandates in communities, and for educating the public about concerns over CCSS mandates. For instance, after contacting one of us (Diane) for help dealing with the mandate eliminating play from her kindergarten classroom, the teacher formed a support-study group with the four kindergarten teachers in her school. They chose a book to read on the importance of play in learning academic skills (Hirsh-Pasek & Golinkoff, 2004). They plan to have a meeting with their principal and curriculum coordinator to advocate for a play-based kindergarten curriculum with clear information about how literacy and math skill learning will be incorporated.
- Use existing research on what we know about best practice for the developmentally appropriate teaching of math to young children. For instance, one goal of the CCSS in math and other areas is to better meet the learning needs of children of low-income families. However, little research was done before implementing the CCSS to show that this was an effective means to teach math to children of low-income families. And, it is not always obvious how the developers of the early childhood Common Core Standards used prior research growing out of Head Start on how to best meet the learning needs of children of low-income families.
- Work with families to help them understand how their young children learn the foundations of math and other academic skills. Share concrete examples of the math children are learning through play-based classroom activities and make suggestions for how families can build on this learning at home. Many parents need reassurance that their young children will not be at an academic disadvantage if they do not do math- and reading-based teaching activities at home, and instead, will greatly benefit from engaging in rich, creative play at home that often spontaneously incorporates the kinds of math foundational skills that the children were learning in the rock play in Scenario #2! Teachers Resisting Unhealthy Children's Entertainment (TRUCE) provides ideas for many inexpensive family play activities ("Family Play Plans") on its website: www.truceteachers.org.

References and Resources

Common Core Math Standards.

www.corestandards.org/Math/

Gray, P. (2015, July 8). K & preschool teachers: Last stand on war on childhood. *Psychology Today Blog*. Available at: www.psychologytoday.com/blog/freedom-learn/201507/k-preschool-teachers-last-stand-in-war-childhood

Hirsh-Pasek, K., & Golinkoff, R. M. (2004). *Einstein never used flashcards: How our children really learn — and why they need to play more and memorize less*. Cincinnati, OH: Rodale Press.

Kamii, C. (2015). *Selected standards: From the Common Core State Standards for Mathematics, Grades K-3: My reasons for not supporting them*. Available at: <https://deyproject.files.wordpress.com/2015/05/kamiideyccssmathpaper.pdf>

Katz, L. G. (2015). *Lively minds: Distinctions between academic versus intellectual goals for young children*. Defending the Early Years. Available at: <https://deyproject.files.wordpress.com/2015/04/dey-lively-minds-4-8-15.pdf>

Levin, D. E. (2013). *Beyond remote-controlled childhood: Teaching young children in the Media Age*. Washington, DC: NAEYC.

Shoenfeld, A. (2014, September 21). *Common sense about the Common Core*. (Retrieved September 12, 2015: <http://gse.berkeley.edu/sites/default/files/users/alan-h.-shoenfeld/CommonSenseCommonCore-AHS20140921.pdf>

TRUCE

www.truceteachers.org

family play plans: <http://truceteachers.org/guides.htm>

Van Hoorn, J., Nourot, P. M., Scales, B. & Alward, K. R. (2015). *Play at the center of the curriculum* (6th ed.). Boston: Pearson.

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works to mobilize the early childhood community to speak out with well-reasoned arguments against inappropriate standards, assessments, and classroom practices and promote appropriate practice.