Making Math Meaningful For Diverse Learners

Source: NAEYC

Children with different levels of exposure to math vocabulary and math activities may enter your classroom from diverse language, cultural, and experiential backgrounds. When mathematical learning at school connects to familiar experiences and objects in children's lives, the math can seem more interesting and make more sense to children!

Story 1: Jia

Jia sits at a table with the other 4-year-olds in her class. The teacher gives each child sheets of blue, red, and yellow paper and a handful of blue, red, and yellow buttons. She says something in English that Jia doesn't understand. Jia picks up some buttons and taps them together, but when the teacher gives her a stern look, she puts them down. She sees the other children putting the buttons on paper of the same color, so she does too. The teacher smiles, then collects the papers and buttons and dumps them in a box. Later, when her mom asks what happened in school, Jia tells her she put some buttons on paper. She doesn't know what else to say about the activity.

Story 2: Ameer

Ameer sits on the floor with the other preschoolers. The teacher, Mr. Jackson, brings out a basket of socks in different sizes and colors. He sits with Ameer and three of his friends and talks about the socks, attempting to say *aljawarib* (socks, in Arabic) and *farz aljawarib* (sort the socks, in Arabic) to help them understand the key words and the activity. Mr. Jackson and the children take off their shoes and try on different socks, sorting them into piles of "Fits the Teacher" and "Fits the Children." The children laugh when Mr. Jackson tries on a baby sock and when they try big socks on their own feet. Together they sort, compare, and observe, even though the children don't speak the same language as the teacher.

At home that afternoon, when Ameer sees a basket of clean laundry, he shows his mom what he learned in school. They laugh at Ameer's stories about mismatched socks and feet. Ameer tells his mom he's happy because he learned the word socks. Mr. Jackson helped him see it was the same as *aljawarib*. It was a fun and useful conversation for teacher and child.

Of these examples showing two different math activities, the second was more meaningful to a child with limited English than the first. Mr. Jackson used two strategies in his sock-sorting activity that made it more successful for dual language learners:

- He chose materials that gave children clues about the skills they were learning, regardless of how much English they understand. The authentic activity used familiar, real-life objects (socks) in a useful and functional activity (sorting socks).
- He tried pronouncing the Arabic words for two key terms—socks and sort.

Familiar objects and situations add meaning to any math exploration and help all children understand and use what they've learned.

Look for examples of counting, comparing quantities, ordering, patterning, identifying and comparing shapes, measuring, and sorting in activities that children do regularly and that are useful in their lives. This is the best way to build connections with what children already know—no matter what language they speak.

Here are examples of everyday experiences for children that are great jumping-off points for integrating intentional math learning.

- Setting the table for meals and snacks
- Distributing art or project materials
- Comparing containers during cleanup time to see which toys fit and which don't fit
- Reading recipes and cooking
- Taking turns while playing games
- Singing songs with repeating choruses
- Planning and building structures with blocks or cardboard
- Sorting crayons, puzzle pieces, or playdough to make use of old or broken pieces
- Putting on clothes before going outside
- Completing tasks that require a certain order ("We can't put our shoes on before our socks!" or "We can't dry our hands before we wash them!")
- Reviewing the familiar schedule or routine of the day
- Checking to see if there are enough supplies for all the children participating in an activity

Many early childhood programs find math the hardest area in which to improve children's outcomes and assessment scores. Most portfolio-based assessments encourage teachers to use real items and naturally occurring activities—these often often-overlooked ideas can be the keys to success in supporting growth on standardized assessments. Here's an example from one program I observed that served a population living in poverty and speaking multiple languages.

Story 3: Miss Crystal

Miss Crystal attempts to record examples of children's understanding of patterns by having the children line up plastic manipulatives in the order of red, green, blue, red, green, blue. She tries to explain the activity in English, though most of her students speak other languages. The children are confused and do some unintentional playing—not much real math learning.

When we talk later, Miss Crystal admits that she isn't even sure the children understood the color names or the ordinal terms *first*, *second*, *third*, and *next*. We talk about when patterns appear naturally in the children's lives, and she realizes that some of the class's favorite songs have repeating patterns. Miss Crystal plans to introduce "Head, Shoulders, Knees, and Toes" during the next small group time. After they become familiar with it, she'll be quiet and let the children finish the song to see if they remember the order of the body parts. She can observe pattern knowledge in children who use words in other languages or who use only gestures. Miss Crystal feels more confident thinking of where math skills appear in other daily activities, realizing that math learning doesn't have to happen only during a scheduled time.

To plan for meaningful math learning, ask yourself these questions:

1. **How do people use this skill in real life?**
   Counting cups for snack time or counting the number of children playing in the block area gives children a sense of the value of counting even if they don't know all of the vocabulary yet.
2. **What kind of materials or activities would help a child understand the skill, even if he doesn't understand my words?**
   It makes sense to measure a table by seeing how many plates will fit for lunchtime or how many pieces of paper will fit for an upcoming art activity. These kinds of measurement have obvious meaning to children, even with language barriers. Setting unrelated items (like paper clips or blocks) on a table and counting them would be hard for many children to understand, and the confusion would interfere with their experiences of measuring.
3. **How can children use this skill at different times or in different areas of the classroom?**
   If children can measure the snack table using plates, those same plates could be used to measure the small table in the kitchen area or the counter next to the sink. Once children learn to count the number of cups needed for their friends at snack time, they can move on to counting the number of glue pots needed for an art project or helmets needed for children who want to ride trikes on the playground.

A math activity should not be a onetime event. To be sure that each child learns a skill, it's important to provide lots of repetition and practice. Highlight any opportunity for using the latest math skills in everyday activities. How many crayons do you need to draw your picture? How many blocks will you need to make your tower tall? How many mittens should you have when you go outside? Using real-life examples makes it easier for children to continue practicing at home and for their families to get involved in supporting that practice. Meaningful math is both universal and inclusive—it opens the door to learning for all children.

To learn more about teaching children from Different Experiences, Cultures, Abilities, and Languages (DECAL), read "Naming the New, Inclusive Early Childhood Education: All Teachers Ready for DECAL!," by Karen Nemeth, Pamela Brillante, and Leah Mullen.www.languagecastle.com/2015/08/decalforinclusiveearlyed/

Audience: Teacher

Age: Preschool

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