



Oral Language Needs:

Making Math Meaningful

Michelle H. Pace and Enrique Ortiz

A mathematics vocabulary strategy helps kindergartners form real-world connections.

BOY: BRIAN/JACKSON/THINKSTOCK; DRAWING: ELENA KALISTRATOVA/THINKSTOCK



As a Title I kindergarten teacher, I (Pace) have seen firsthand how oral language can create roadblocks for students in all areas of the curriculum, both academically and socially. My experience has placed a major focus of oral language solely on reading skills and standards. At the time of this writing, the state of Florida had recently adopted the Common Core State Standards for Mathematics (CCSSM) (CCSSI 2010), providing an opportunity to address mathematical concepts with more depth and meaning.

As I unpacked CCSSM, I noticed one huge difference between them and the standards I had been following. CCSSM requires students to deepen their learning by communicating explanations of their answers, in oral language and in writing. Additionally, CCSSM presents the Standards of Mathematical Practice (SMPs), which offer a teachers' guide to teaching mathematics with a focus on processes and proficiencies.

Of the eight practices, SMP 6: “Attend to precision” focuses on students’ ability to accurately use vocabulary when explaining their reasoning behind an answer. Teachers should strive to include this practice within their lessons to help their students deepen their mathematical understanding through communicating their thought process (CCSSI 2010).

How do kindergarten teachers take a mathematical practice as advanced as “attend to precision” and make it happen in their kindergarten lessons? How do we overcome the major hurdles presented to us by kindergarten students coming from different levels of preparation? We must use oral language strategies to make kindergarten mathematics meaningful.

Building a strong foundation

The American Speech-Language-Hearing Association (ASHA 2013) defines language as an elaborate code made up of socially shared rules that involve the meaning of words, making new ones, putting them together, and finding the best combinations in a given situation; and speech as the oral form of language, which includes articulation (speech sounds), voice (use of vocal folds and breathing), and fluency (the rhythm of speech). Oral language development is one of the most important, yet basic, foundational skills of children:

If children come to school with well-developed oral language, it must be expanded. If children come to school with underdeveloped oral language, it must be developed. Research-based instructional materials must provide instruction and activities to develop and expand oral language, including such opportunities as hearing and using good language models, talking about and discussing meaningful topics, and so forth. The necessity for oral language development and expansion extends from preschool through children’s later school experiences. (Education Place 2013, p. 4)

Children enter kindergarten with varied background knowledge and experiences.

The process of teaching children to read includes building vocabulary and creating a foundation of prior experiences for the learner to spring from as he or she enters the world of reading. Students are taught to draw from life experiences and share what they know as they master letters and sounds and create fluency in their decoding skills. So, how do oral language skills affect mathematics success? As the education community makes a shift in standards to CCSSM, in which standards are taught in depth with expected proficiency in concepts, it is time we reflect on and explore how oral language can affect not only reading proficiency but math proficiency as well. Teachers need many strategies in their teaching toolbox. All teachers can benefit from a vocabulary strategy aimed at assisting in their students’ oral language development while enhancing mathematical thinking.

Vocabulary strategy

In a recent math professional learning community (PLC), my kindergarten team was introduced to a vocabulary strategy (Clancy 2010), which elicited connection from their taught vocabulary word to students’ created pictures. The vocabulary chart is displayed in the classroom so that students can refer to it later. The goal of using this strategy is to give students the opportunity to make meaning of mathematical vocabulary through pictures, words, and oral communication. Many students in my class lack oral language skills or are categorized as English language learners

Riley and her kindergarten peers were eager to share their real-world connections to other students’ drawings.



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Riley worked on a picture to show what the word *joining* meant to her.

(ELLs). I have found this vocabulary strategy to be beneficial for students' mathematical learning and also as a language intervention strategy for students who have oral language deficiencies.

Implementing vocabulary chart activity

In anticipation of introducing the concept of addition, I knew this would be the perfect opportunity to get students' learning off to a solid start with rich addition vocabulary lessons. CCSSM K.OA1 states that students will "represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps)," physically "acting out situations, verbal explanations, expressions, or equations" (p. 11). Key vocabulary terms include *in all* and *joining*. I created an introductory mathematics lesson focusing on the word *joining*, which used the vocabulary strategy as a lone activity focused on the word *joining*. To successfully create the vocabulary chart with student work, it is important for the teacher to give many concrete examples of the chosen vocabulary word so that students can visually see what the word means and also to be physically involved in defining the word through manipulative materials. For example, students were actively involved with the joining process by acting out scenes such as playing in the block lab. We talked about what it would mean for another student to join them in the block area. Students volunteered such

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answers as "We can go play with them, so now more students will be at the block lab" and "Now we will play together." Students started to catch on to keywords, such as *together*, as they described the situations and process presented to them.



Darius shared with his classmates the real-world connection he had made to the word *join*.

Yariana's classmates made sense of the term *joining* as they discussed her finished picture.



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Another example used animal manipulatives. I created two groups of animals in two separate locations. While I physically moved the two groups into one large group, I asked my students to describe what was happening to the groups. I did this several times, using a variety of groups and then asking students to share with their partner what was happening to the groups. My students were obviously making the connection of joining two groups together because conversations among partners included specific vocabulary such as *altogether* and *joining*. Van de Walle, Karp, and Bay-Williams (2013, p. 107) explain, “Mak-

ing their strategies public and connecting the strategies to others is interesting and supports learning of all students, while building confidence for the ELL.”

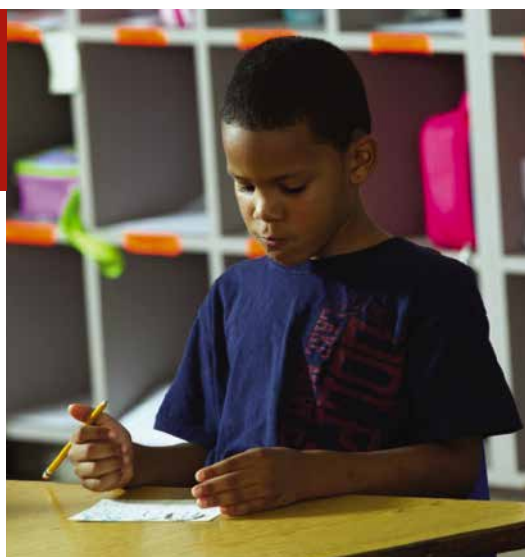
Sharing their work

After many modeling examples, students were ready to create the vocabulary chart by creating their own pictures to explain what the word *joining* meant. They were asked to take an index card back to their seat and draw a picture that would explain to the class what *joining* meant. I explained to them that they must be able to tell the class about their picture and why it represented *joining*. That students understood the vocabulary term was apparent because they applied the word to a real-world situation that they had created. After ten minutes of watching my little mathematicians draw furiously, we started our group sharing. One by one, hands flew into the air, eager to share their work. Students provided answers such as these:

- “I was playing outside, and my mom joined me; now we are both playing together.”
- “Here is one marker, and two more are given to me to join; now I have [*counting aloud and pointing*] three.”

Students were able to define the word *join* by creating a meaningful picture. At this point in the lesson, I could tell no observable difference between the varying academic levels of

Anthony's deep concentration was evident as he worked on his picture.



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my students. One of my ELL students drew a picture of herself playing under a rainbow with a friend. As she showed her picture to the class, she said, “Here I am playing under a rainbow, and my friend came to join me. Now, there are two children under the rainbow.”

Another student raised her hand and added, “There are more kids under the rainbow when you join.”

In my classroom, students were making sense of the term *joining* in their own way, making their understanding meaningful and observable through their pictures and dialogue. Students felt more confident in class after this activity. The vocabulary chart displays a piece of each student’s thoughts and now hangs in our classroom. The chart enhanced student learning because it helped them apply new knowledge in their own way to make a real-world connection that they could understand. It also served as a constant visual in the classroom to refer to as we tackled new words, such as *plus* and the addition symbol. For example, after a few lessons learning joining stories and addition problems, students asked me if we could add the addition symbol (+) to the chart, as they now understood it also means *joining*.

Helping students learn

As I compared my teaching of addition from this year to previous years, I felt that this chart helped my students’ learning of mathematics and oral language. I had embraced the foundational needs of each student and created a firm basis that met students at their individual level. As my class progressed through the concept of addition, I observed students attending to precision, which I once saw as unattainable for my students. Their understanding of addition deepened meaningfully as they used real-life stories they created to understand the process of joining groups together. For example, days after the vocabulary chart lesson, I was lining up students for dismissal. As I called each mode of transportation to line up, one of my language students raised his hand and said, “The bus riders are joining the car rider line, just like in our chart we made! The line has more kids now!” I could hear the satisfaction in his voice. It was evident that the meaning of the word *joining* made sense to this student. He demonstrated



The vocabulary chart hung in the classroom, a visual reminder of each student’s work, enhancing their learning as well as helping them apply new knowledge and make real-world connections.

Students were making connections because conversations among partners included specific vocabulary.

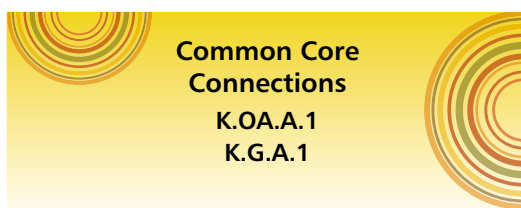
that he understood the very basics needed to comprehend addition. The evidence is in not only their assessments but also their ability to communicate with their peers.

A diverse, adaptable, useful tool

Oral language development is an ongoing skill addressed in elementary school classrooms. This vocabulary strategy can be adapted to other disciplines and grade levels. For example,

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it could be used as a quick formative assessment, after vocabulary terms have been taught, to help teachers monitor progress. The strategy could also be easily adapted to small-group instruction to re-teach important vocabulary. At other grade levels, a similar process could be adapted to include student-produced illustrations, photos, or newspaper clippings that support students' understanding and oral language development of mathematics operation concepts like take-away subtraction, comparison subtraction, multiplication as repeated addition, multiplication as rectangular array, partitive (sharing) division, or measurement (subtractive) division. In conclusion, this oral language strategy is a diverse, adaptable, and useful learning tool available to help students deepen and expand their conceptual understanding of mathematical concepts with real-world connections.



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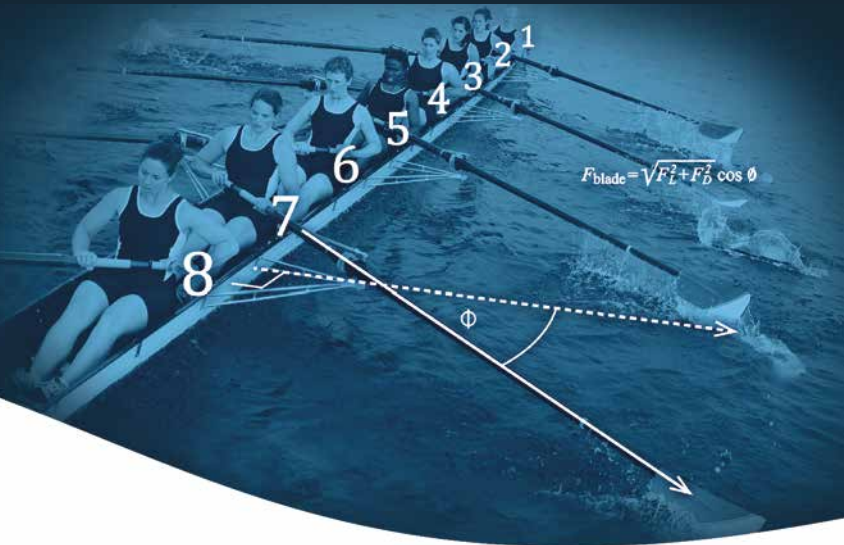


Michelle H. Pace, michelle_pace@scps.us, teaches second grade at Lake Mary Elementary

School in Lake Mary, Florida. She is interested in problem solving and the development of mathematics vocabulary to deepen students' conceptual understanding. Enrique Ortiz, enrique.ortiz@ucf.edu, is an associate professor and teaches mathematics methods courses at the University of Central Florida in Orlando. He is interested in brain-based research and the use of technology to teach mathematics.

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