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## VOCABULARY CONSIDERATIONS FOR SCIENCE

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Our students are consistently presented with new discipline-specific Tier 3 vocabulary words (such as *organism*, *species*, and *population* from this chapter's opening vignette) alongside high-frequency academic Tier 2 vocabulary words (such as *analyze* or *summarize*) throughout their science education. This vocabulary is critical in helping students understand science concepts while learning as scientists—engaging in the practices of explanation and argumentation that are a big part of the science standards. Given the sheer quantity of words our students must master, it can be very tempting to focus our science instruction on helping them master vocabulary. With this approach, we teach vocabulary first and provide hands-on experiences second. In this manner, the hands-on experiences reinforce the previously introduced vocabulary. This approach goes by many names, such as “drill and kill,” which might make sense. After all, this vocabulary will appear on the assessments our students will take and to which we are held accountable.

However, this is not the approach we propose in this chapter. Earlier, we shared that the average native English speaker and the average MLL enter school knowing 5,000 words in their primary language (Colorín Colorado, 2007). In both cases, this vocabulary exists within each student's experiences in a real-world context. Therefore, it is essential first to provide our students the context for new words through hands-on, real-world experiences to which they can later attach vocabulary. This approach aligns with the Mode Continuum in Inquiry discussed previously and the authors' vision of the science framework on which the Next Generation Science Standards (NGSS) are based. Within this framework, the authors state, “Furthermore, for students with limited language skills, the absence of opportunities to engage in science learning deprives them of a rich opportunity for language development that goes beyond basic vocabulary” (NRC, 2012, p. 283).

The vocabulary Equity Moves in this chapter (vocabulary pre-assessment, cognate word walls, cognate dictionaries, contrastive analysis, and the Scaffolded Frayer Model) help build background knowledge through activities accessible to every student. They help to level the playing field and allow us to honor our content areas and value student discourse truly.



## Reflective Questions

- Tier 2 words are high-frequency words such as *analyze* or *summarize* that can often be connected to the objective, assessment, or standards being taught within a lesson or unit. As you think about science instruction, what additional
- Tier 2 words might productively contribute to your students' language abilities?
- What are some instructional practices you have found to be most effective in building background knowledge with your students?

## VOCABULARY CONSIDERATIONS FOR MATHEMATICS

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As with their experiences in science, students will engage with many terminologies as they do more problem solving specific to mathematics. Making vocabulary considerations in mathematics gives teachers the space to be thoughtful about providing students opportunities to make sense of mathematics. Additionally, teachers can consider ways of supporting students to develop dispositions that may be helpful as these young people engage in more problem solving over time. For instance, teachers can intentionally support students to make sense of problems and persevere in solving them while also encouraging students to attend to the precision of mathematics. More specifically, as they think about supporting students to develop language, teachers have opportunities to support young people to develop the standards of mathematical practice and see mathematics as intellectually satisfying and fun to engage with. While attending to this, teachers can support students to develop language and understand terminology for the sake of understanding, developing, and constructing new ideas in mathematics. Thus, language is a means to support them in understanding others' ideas, explaining their ideas, and engaging with others' ideas.

Students will learn vocabulary when they engage with terms with meaning and in context. Students will benefit from having opportunities to engage with mathematical terminology when these words are framed in contexts that support them in making connections and developing meaning. Additionally, students will benefit from opportunities to engage in discourse. Engaging in discourse reminds students that their ideas are important for

sharing and developing new knowledge. However, discourse also provides space to continuously refine ideas, including what is typically viewed as academic language and terminology.



## Reflective Questions

- What might be some ways of supporting your students to make connections between their primary language and big ideas in your mathematics lesson?
- How might students see others' primary language(s) as important for learning mathematics vocabulary?
- What Tier 2 words might be useful for supporting your students to reason and make sense of concepts and language?

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