Do's & Dont's

of EL Instruction

ENGLISH LEARNERS SUCCESS FORUM

GRADES K–5

GUIDELINE KEY	SUBJECT	AREA OF FOCUS	GUIDELINE	SPECIFICATION	
This resource is related to the following ELSF Guidelines:	MATH	IV	10	10B	10C

Don't Underestimate the Power of Contexts in Mathematics Curricula

Introduction

As teachers, we have often come across mathematical problems that are situated in real-life, curricular contexts unfamiliar to our students (e.g., a sport they have never played). In other cases, we have seen contexts that students are familiar with (e.g., a grocery store), yet the actions embedded in the context are unlikely (e.g., buying 100 watermelons). Over time, we wondered: When does the context interfere with students' mathematical learning? How much instructional time do I invest in building the meaning for this context? How should I select contexts to use with my students, including multilingual learners?

Given students' varied cultural, educational, and life experiences, teachers must consider how their curriculum facilitates or restricts access to mathematics and language[1]. Moreover, teachers need to be strategic in selecting, enhancing, and introducing contexts that can expand multilingual learners' understanding of the world. It is critical to consider the **mathematics** content and **language** as teachers create or adapt contexts from your curriculum materials. As we design contexts for mathematical problems and tasks, we consider the following questions:

1. How can I situate the mathematical concept in a **context** with which multilingual learners are familiar? Alternatively, how can I introduce new contexts to the students?
2. What **mathematics content** will I address using this context?
3. What are specific words or terms that are involved in this context? How familiar are my students with the **language** involved in the context and instructions? What are words and terms whose **meanings** need to be unpacked? What syntax (e.g., word order in a sentence) or discourse specific to mathematics should I teach? What strategies would I use to unpack the meaning of this language?
4. What **visuals**, including videos, photos, and objects, can I use to contribute to multilingual learners' mathematical learning?

Using contexts, including situations related to the multilingual learners' experiences and culture, can provide opportunities for engaging mathematical problems and tasks as well as using and learning language. For example, to introduce division with remainders, Ms. Bristow facilitated a discussion with her third graders about the use

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and meanings of "leftover," connecting to the students' daily practice where leftovers were placed in the middle of the cafeteria tables for children to share. She also distributed paper plates and cut-out cookies for the students to simulate different division situations involving remainders. She eventually introduced the mathematical term, *remainder*, by connecting it to their understanding of *leftover*. Students connected the concrete materials with language and mathematical symbols throughout this unit.

Based on the research and ELSF guidelines, we suggest the following:	
DO Capitalize on ELs' interests and experiences. Get to know where your students live, play, shop, and eat. Create videos and take photos in your community at locations your students frequent (e.g., local stores and parks) using your smartphone, which can be shown during lessons with technology (e.g., a projector, an interactive whiteboard) to select meaningful and culturally-relevant contexts for your mathematics lessons.	DON'T Don't pass up an opportunity to discover contexts that might be appropriate by visiting with your ELs and their families to learn about their cultural practices and experiences. Approaching these visits with authentic curiosity and humility will support efforts to create contexts that are not based on assumptions and stereotypes. Use videos you find online from countries that will honor ELs in your classroom (e.g., a marketplace in Turkey for students from that country).
DO Use contexts where mathematical concepts are reflected in aspects of ELs' community and culture (e.g., marketplace, social gatherings, money) or draw on experiences familiar with entire class (e.g., field trip, school assembly, eating in cafeteria, tending the school-community garden).	DON'T Don't select contexts that are only based on your experiences and interests, if your students will not connect with them.
DO Develop a diverse classroom library with books that have characters with whom children can identify. Utilize the library to select contexts for mathematics lessons. For example, *Lemonade in Winter* by Emily Jenkins, introduces a lemonade stand and money that could be used to introduce a context.	DON'T Don't feel the need to introduce a new context for each math lesson. If you choose a context that can be used across multiple mathematical concepts (e.g., shopping, cooking, community event, financial literacy, current events), this can save time as you won't have to invest time to develop background knowledge.
DO Introduce and build meaning for new contexts and related problems using videos, photos, stories, real objects, and gestures to build background knowledge and interest.	DON'T Don't use too many contexts within each lesson and unit. *Use a thematic approach* with the same context to provide a series of related tasks over multiple lessons at the beginning of the year. Then, add more contexts over time.
DO Provide opportunities for students to write their own mathematics problems using contexts or photos from different sources (e.g., store catalog or magazine) for their peers to solve. With older students, they could be given a graph and asked to write a story that represents the data in the graph.	DON'T Don't eliminate access to word problems or simplify tasks in ways that reduce mathematical rigor. Lowering mathematical expectations for multilingual learners is not the answer.
DO Use different strategies to set up a context such as needing the students' help with a particular situation, connecting to situations we encounter in our families and communities, or referencing knowledge and expertise of students' families. We often keep key ideas from a specific context on chart paper so we can refer back to it in future lessons.	DON'T Don't *only* use contexts your students already know since this will do little to prepare them for when they encounter unfamiliar contexts. Those that are unfamiliar will expand students' understanding of different contexts while advancing their language development across a wide array of topics and experiences.
DO Create opportunities to empower ELs to have leadership roles as you introduce and discuss contexts in your lessons. Display ELs' math work as a model for other students to position them as a math authority.	

It is recommended that these practices be part of a comprehensive approach to EL instruction and not in isolation as laid out in our Guidelines for Improving Math Materials for English Learners.

Endnotes

1 Chval, K.B., Smith, E., Trigos-Carrillo, L., & Pinnow, R.J. (2021). *Teaching math to multilingual students: Positioning English learners for success.* Thousand Oaks, CA: Corwin Press.

Doerr, H. M., & Chandler-Olcott, K. (2009). Negotiating the literacy demands of standards-based curriculum materials. In J. Remillard, B. Herbel-Eisenmann, & G. Lloyd (Eds.), *Mathematics teachers at work: Connecting curriculum materials and classroom instruction* (pp. 283–301). Routledge.

Further Reading

Domínguez, H. (2011). Using what matters to students in bilingual mathematics problems. *Educational Studies in Mathematics*, 76(3), 305–32.

Pitvorec, K., Willey, C., & Khisty, L. L. (2011). Toward a framework of principles for ensuring effective mathematics instruction for bilingual learners through curricula. In B. Atwah, M. Graven, W. Secada, & P. Valero (Eds.), *Mapping equity and quality in mathematics education* (pp. 407–422). Springer.

Vomvoridi-Ivanovic, E. (2012). Using culture as a resource in mathematics: The case of four Mexican-American prospective teachers in a bilingual after-school program. *Journal of Mathematics Teacher Education*, 15, 53–66.

Wager, A. (2012). Incorporating out-of-school mathematics: From cultural context to embedded practice. *Journal of Mathematics Teacher Education*, 15, 9-23.