

# Connecting Critical Intersections

This tool was created to address the need for English learner (EL) supports in enhancing English proficiency, including language scaffolding, student talk, and clarifying their understanding of mathematical concepts. This tool seeks to assist teachers with classroom actionables in the form of scaffolding and supports that model equitable instructional practices for ELs, and foster rigor to develop language and mathematical conceptual understanding. It specifically addresses considerations around educator biases and beliefs and the diversity that exist among ELs. These issues are key to their success in both developing academic English proficiency and deepening their understanding of the mathematical concepts that were not addressed adequately in prior learning experiences.

## THEMES

Teacher Beliefs  
Content + Conceptual Understanding  
English Language Development  
+ Scaffolding  
Teacher Support

## GUIDING PRINCIPLES

Equitable access to grade-level priority math standards.  
Learning opportunities for students to engage with the standards for mathematical practice.  
Targeted curricula and practices designed to create equitable access to math instruction for students gaining English proficiency.  
Assets-based formative assessments to inform instruction.

## HOW TO USE THIS TOOL

This tool encourages teachers to **nurture opportunities for English learners to share their thinking and clarify their understanding of mathematical concepts**. It highlights effective instructional approaches in content areas, and identifies language scaffolding practices that support ELs. The grade-level samples exemplify how teachers can enhance instruction around the identified content priority standards. The general template that follows can be used to recreate a similar tool with an additional content standard. While this tool does not address all aspects of supporting ELs, it does seek to bridge the alignment of best practices, California English Language Development (ELD) standards, and mathematical priority content.

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# Resources

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# Appendix

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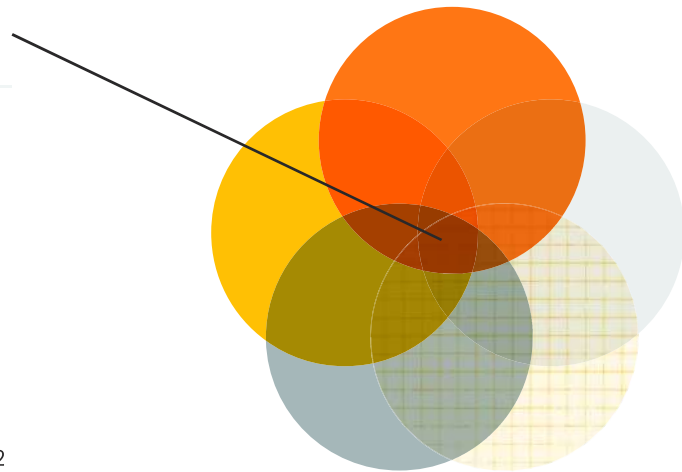
## Summary of Resources Used by Tool Developers

This tool presents support, ideas, recommendations, and considerations for educators on how to scaffold language to develop mathematical concepts and communication, providing examples of effective classroom practices that align with key principles to effectively support English learners. One table for grades 6–8 is provided to serve as an example of principles and activities that classroom teachers can strategically use to support English learners in mathematics.

This document seeks to synthesize research surrounding effective instructional principles and practices for English learners, and apply them to Common Core Mathematics Priority Standards and CA ELD Standards in order to support teachers with developing students' understanding of mathematical concepts and with communicating their understandings.

### Considerations for Supporting Priority Math Content for Students Gaining Proficiency in English in Grades 6-8

- Framework for Re-envisioning Mathematics Instruction for English Language Learners
- Guidelines for Improving Math Materials for English Learners
- English Learner Road Map
- 2020-2021 Priority Instructional Content in ELA/Literacy and Mathematics
- Integrating the CA ELD Standards into K-12 Mathematics and Science Teaching and Learning



The descriptions below summarize the sources incorporated in the creation of the tool.

### The Council of the Great City Schools

#### **“2016 Framework for Re-envisioning Mathematics Instruction for English Language Learners”**

The “Key Instructional Principles and Practices” found in the 2016 “Framework for Re-envisioning Mathematics Instruction for English Learners” highlight the need for “understanding the interdependence of language and math in an era when the new college- and career-readiness standards in mathematics include unprecedented language demands.”

A focus was placed on the practice of encouraging productive struggle. The Framework details that students must engage in rigorous grade-level tasks and assignments in which they are growing their conceptual understanding through productive struggle. The struggle is productive because students are supported using strategic scaffolds designed to grow their conceptual understanding. A result of this growth includes the application of academic language to explain, conjecture, and justify their reasoning during constructive conversations. The research surrounding effective instructional principles and practices for English learners was instrumental in creating the grade-level examples below.

## English Learner Success Forum

### “Guidelines for Improving Math Materials for English Learners”

The abovementioned “Key Principles” were echoed in the English Learner Success Forum’s Guidelines for Improving Math Materials for English Learners “Areas of Focus” needed to provide quality supports for ELs:

- Mathematical Rigor through Language
- Interdependence of Mathematical Content, Practices, and Language
- Leveraging Students’ Assets
- Assessment of Mathematical Content, Practices, and Language
- Scaffolding and Supports for Simultaneous Development

Additionally, the Guidelines document also provides examples and resources for teachers that address each of their Areas of Focus.

## English Learner Road Map

California Department of Education’s English Learner Roadmap is intended to provide guidance to local educational agencies on welcoming, understanding, and educating the diverse population of students who are English learners attending California public schools. Principle Two: Intellectual Quality of Instruction and Meaningful Access” was a guiding document for creating the tool.

## Student Achievement Partners

### “2020-2021 Priority Instructional Content in ELA/Literacy and Mathematics”

The mathematical priority clusters detailed in this document were used to select sample standards for the grades 6–8 examples below. This was done to support teachers with instructional decision making during the time of pandemic teaching, as an attempt to support the targeting of high-leverage standards without compromising rigor.

## WestEd

### “Integrating the CA ELD Standards into K–12 Mathematics and Science Teaching and Learning”

“Integrating the CA ELD Standards into K–12 Mathematics and Science Teaching and Learning” aligns math standards to ELD standards and includes mathematical practices and activity suggestions. The *Instructional Priority Content* document was combined and enhanced with guidance found in the Integrating document to support how priority standards can be addressed with ELD supports.

## Alignment of Framework for Re-envisioning Mathematics Instruction for English Language Learners and Guidelines for Improving Math Materials for English Learners

Developers searched for alignment among the Framework’s key principles and practices—designed to address the language demands in the new standards for mathematics that may pose challenges for students who are developing both English proficiency and academic language in mathematics—and ELSF’s Guidelines for Improving Math Materials for English Learners in order to better understand how to incorporate the guidelines and key principles into the designing of this document.

ALIGNMENT	
<u>Framework for Re-envisioning Mathematics Instruction for English Language Learners</u>	<u>Guidelines for Improving Math Materials for English Learners</u>
<p><b>Employing Rigorous Tasks and Assignments</b></p> <p>Tasks and assignments for ELs and all math learners should be at a high level of cognitive demand, mathematically rigorous, on grade level, and make explicit connections between new and prior concepts.</p> <p>This may require multiple entry points, along with other appropriate supports for language development and communicating their understanding of mathematics, to allow for productive struggle while maintaining the high cognitive demand of the task.</p>	<p><b>Area of Focus III: Mathematical Rigor through Language</b></p> <ol style="list-style-type: none"> <li>7. Explicit guidance for teachers to engage students in using mathematical practices.</li> <li>8. Maintain appropriate challenge and high expectations of mathematics learning for EL students.</li> <li>9. Guidance for facilitating mathematical discussion and co-construction of meaning.</li> </ol>
<p><b>Encouraging Productive Struggle</b></p> <p>Allowing students sufficient time to make sense of a task or problem before intervening.</p> <p>Teachers should resist the urge to lighten productive struggle, and instead, look for ways to retain the productive nature of the struggle.</p>	<p><b>Area of Focus III: Mathematical Rigor through Language</b></p> <ol style="list-style-type: none"> <li>7. Explicit guidance for teachers to engage students in using mathematical practices.</li> <li>8. Maintain appropriate challenge and high expectations of mathematics learning for EL students.</li> <li>9. Guidance for facilitating mathematical discussion and co-construction of meaning.</li> </ol> <p><b>Area of Focus IV: Leveraging Students’ Assets</b></p> <ol style="list-style-type: none"> <li>10. Opportunities to draw on and incorporate students’ cultural backgrounds and lived experiences in mathematics learning.</li> <li>11. Suggestions for incorporating and valuing ELs’ written and spoken contributions.</li> <li>12. Encouragement for ELs to use and build on existing language resources.</li> </ol>

**ALIGNMENT** (continued)**Framework for Re-envisioning Mathematics Instruction for English Language Learners****Employing Multiple Modes and Representations in Mathematics**

- Universal Design for Learning (UDL) opportunities for engagement, representation, action, and expression to help advance students' understanding of mathematics.
- Teachers employ multiple modes of written and oral communication, and multiple representations.
- Teachers provide varied opportunities to participate in the classroom using concrete tools, pictorial representations, computers, assistive and instructional technologies, and manipulatives.
- Students are actively engaged in learning and develop the confidence to communicate their mathematical understanding in different modes and representations, using both informal and more formal language.
- Once the door of access and understanding is open, ELs can further develop academic language and use it to engage in mathematical discourse.

**Guidelines for Improving Math Materials for English Learners****Area of Focus I: Interdependence of Mathematical Content, Practices, and Language**

1. Strategic opportunities to use and refine both language and mathematics over time.
2. Explicit mathematics and language learning goals and pathways.
3. Regular and varying opportunities to learn, reflect upon, and demonstrate learning of mathematics using a variety of modes and forms.

**Area of Focus II: Scaffolding and Supports for Simultaneous Development**

4. Opportunities for students to interact with and produce a variety of methods and representations.
5. Directions for providing specialized individual and small group instruction to ELs.
6. Guidance for anticipating potential language demands and opportunities in student activities.

**Area of Focus IV: Leveraging Students' Assets**

10. Opportunities to draw on and incorporate students' cultural backgrounds and lived experiences in mathematics learning.
11. Suggestions for incorporating and valuing ELs' written and spoken contributions.
12. Encouragement for ELs to use and build on existing language resources.

**Area of Focus V: Assessment of Mathematical Content, Practices, and Language**

13. Descriptions, illustrations, and examples of quality work and mathematical practices with varying levels of language proficiency.
14. Assessments able to capture and measure students' mathematics and language progress over time.
15. Guidance for recognizing and attending to student language produced to inform instructional decisions.



**ALIGNMENT** (continued)**Framework for Re-envisioning Mathematics Instruction for English Language Learners****Supporting Academic Language and Conversations**

- Academic discussions focused on mathematical ideas also support exploratory and explanatory talk and writing.
- Precise and informal math language are important.
- In “academic mathematical discussions,” we refer not only to students sharing their solutions to a problem, but discussions where students are supported by the teacher in gradually developing more sophisticated language to articulate their mathematical reasoning, and in deepening the understanding of other students through purposeful teacher or peer questions, focused on the mathematics and the mathematical reasoning.
- Serve as formative assessment to guide supports.
- Meaningfully interact by explaining, clarifying, justifying, and adding to the thinking of others.

**Guidelines for Improving Math Materials for English Learners****Area of Focus I: Interdependence of Mathematical Content, Practices, and Language**

1. Strategic opportunities to use and refine both language and mathematics over time.
2. Explicit mathematics and language learning goals and pathways.
3. Regular and varying opportunities to learn, reflect upon, and demonstrate learning of mathematics using a variety of modes and forms.

**Examples and Resources:**

- [\*Vocabulary Pieces, Roots, And Families; Mathematically Speaking; Strategic Grouping for Home Language Supports\* \(Chval, Pinnow & Thomas, 2014; Vomvoridi-Ivanović & Chval, 2014\)](#)
- [\*Spiralling Math and Language Content; Analyzing Content and Language Demands\*](#)
- [\*Anchor Charts: A Vocabulary Strategy; Bounce Cards for Primary Grades \(Spanish\), Primary Grades \(English\), Intermediate Grades \(English\), Spiralling Math and Language Content; Talk Moves\*](#)
- [\*Are my ELs Attaching Meaning to Math Words?\*](#)

**Area of Focus III: Mathematical Rigor through Language**

7. Explicit guidance for teachers to engage students in using mathematical practices.
8. Maintain appropriate challenge and high expectations of mathematics learning for EL students.
9. Guidance for facilitating mathematical discussion and co-construction of meaning.

**Area of Focus IV: Leveraging Students’ Assets**

10. Opportunities to draw on and incorporate students’ cultural backgrounds and lived experiences in mathematics learning.
11. Suggestions for incorporating and valuing ELs’ written and spoken contributions.
12. Encouragement for ELs to use and build on existing language resources.

**Area of Focus V: Assessment of Mathematical Content, Practices, and Language**

13. Descriptions, illustrations, and examples of quality work and mathematical practices with varying levels of language proficiency.
14. Assessments able to capture and measure students’ mathematics and language progress over time.
15. Guidance for recognizing and attending to student language produced to inform instructional decisions.

**ALIGNMENT** (continued)**Framework for Re-envisioning Mathematics Instruction for English Language Learners****Using Strategic Scaffolding**

- When necessary, teachers should strategically employ scaffolds specifically targeted to meet an individual student's educational needs or academic difficulties, while ensuring that this scaffolding does not compromise their access to rigorous mathematics content or their development of higher-order conceptual understanding.
- The concept of scaffolding is often misunderstood and misinterpreted.
- It provides an entry point for students to actively engage with cognitively demanding grade-level mathematics and empowers students to engage in, and ultimately emerge successfully from, productive struggle.
- It is specifically targeted to reflect an understanding of students' previous experiences with mathematics instruction, their language development history, and their educational needs.
- It should enable all students to be active participants in the mathematics classroom.

**Guidelines for Improving Math Materials for English Learners****Area of Focus I: Interdependence of Mathematical Content, Practices, and Language**

1. Strategic opportunities to use and refine both language and mathematics over time.
2. Explicit mathematics and language learning goals and pathways.
3. Regular and varying opportunities to learn, reflect upon, and demonstrate learning of mathematics using a variety of modes and forms.

**Area of Focus II: Scaffolding and Supports for Simultaneous Development**

4. Opportunities for students to interact with and produce a variety of methods and representations.
5. Directions for providing specialized individual and small group instruction to ELs.
6. Guidance for anticipating potential language demands and opportunities in student activities.

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