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iM K–12 MATH™

Support for English Learners

Equity and Access through Mathematical Language Routines



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Mathematical Language Development

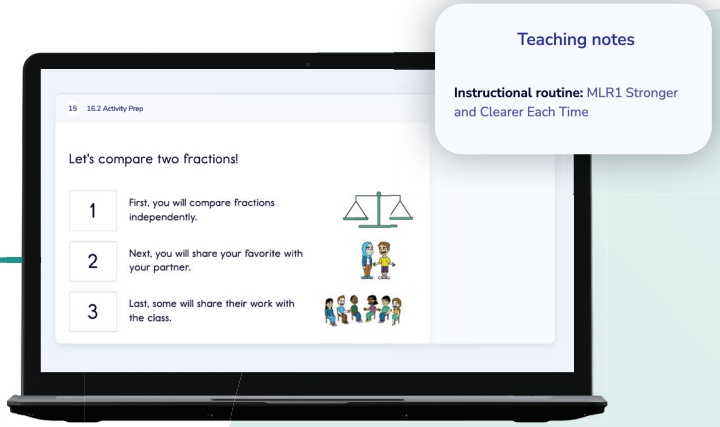
Culturally Responsive Teaching and Learning Using Mathematical Language Routines

Based on the UL/SCALE project from Stanford University, the eight Mathematical Language Routines (MLRs) are embedded throughout all grade levels of Imagine Learning Illustrative Mathematics to amplify, assess, and develop students' language skills. They are a powerful way to ensure that all students have access to the mathematics while keeping the focus on authentic sense-making.

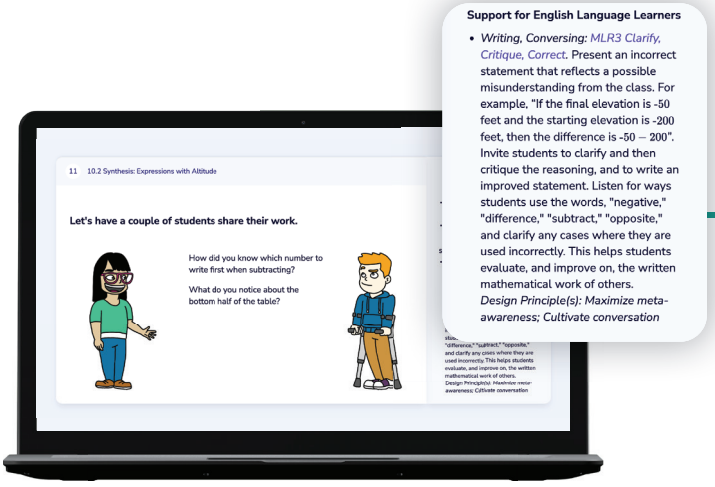
The Mathematical Language Routines across IL IM K–12 include:

- MLR1: Stronger and Clearer Each Time
- MLR2: Collect and Display
- MLR3: Clarify, Critique, Correct
- MLR4: Information Gap
- MLR5: Co-Craft Questions
- MLR6: Three Reads
- MLR7: Compare and Connect
- MLR8: Discussion Supports

MLRs Embedded at Point-of-Use for Timely Support of English Learners



In this activity, MLR 1 **"Stronger and Clearer Each Time"** is called out to provide a structured and interactive opportunity for students to revise and refine both their ideas and their verbal and written output.

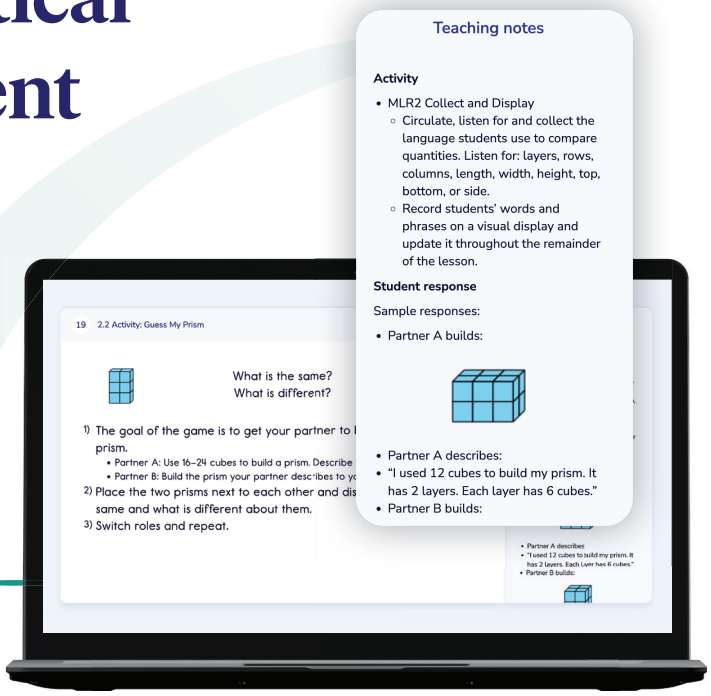


In this lesson synthesis, **MLR3: Clarify, Critique, Correct** is called out as a suggested optional support specifically for English Learners. This routine fortifies output and engages students in considering both an author's mathematical thinking as well as the features of their communication.

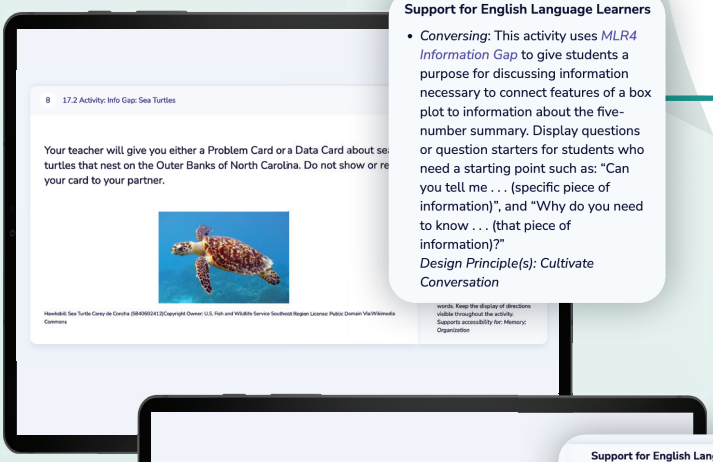
Advancing Mathematical Language Development

Support All students

All MLRs can be adapted and incorporated across lessons in each unit to fit the mathematical work wherever there are productive opportunities to support students in using and improving their English and disciplinary language use. The feedback enabled by these routines will help students revise and refine not only the way they organize and communicate their own ideas, but also how they ask questions to clarify their understanding of others' ideas.



In this activity, **MLR2: Collect and Display** is written into the lesson as an embedded structure in which all students engage. MLR2 is designed to capture a variety of students' oral words and phrases and stabilize the varied and fleeting language in use during mathematical work.

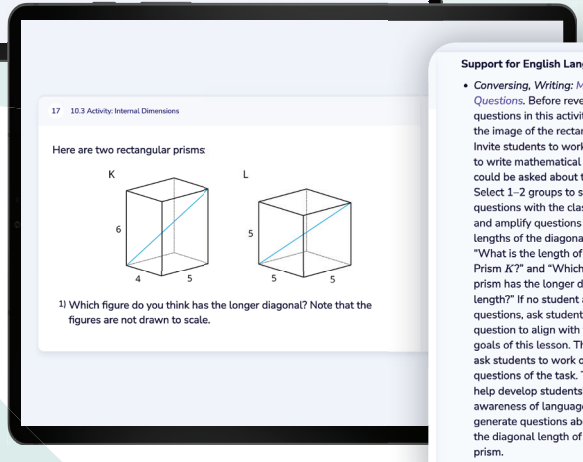


Support for English Language Learners

- *Conversing*: This activity uses *MLR4 Information Gap* to give students a purpose for discussing information necessary to connect features of a box plot to information about the five-number summary. Display questions or question starters for students who need a starting point such as: "Can you tell me . . . (specific piece of information)", and "Why do you need to know . . . (that piece of information)?"

Design Principle(s): Cultivate Conversation

MLR4: Information Gap creates a need for students to communicate. Teachers are able to facilitate meaningful interactions by positioning some students as holders of information that is needed by other students, encouraging students to orally (or visually) share ideas and information to accomplish something they could not have done alone.

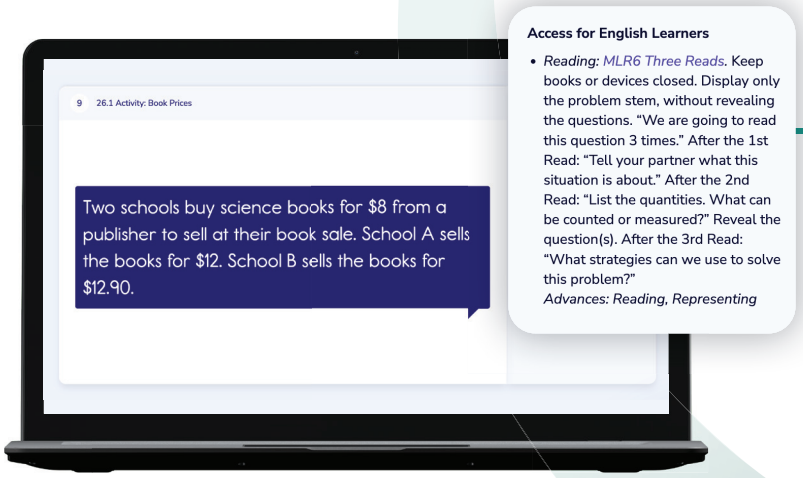


Support for English Language Learners

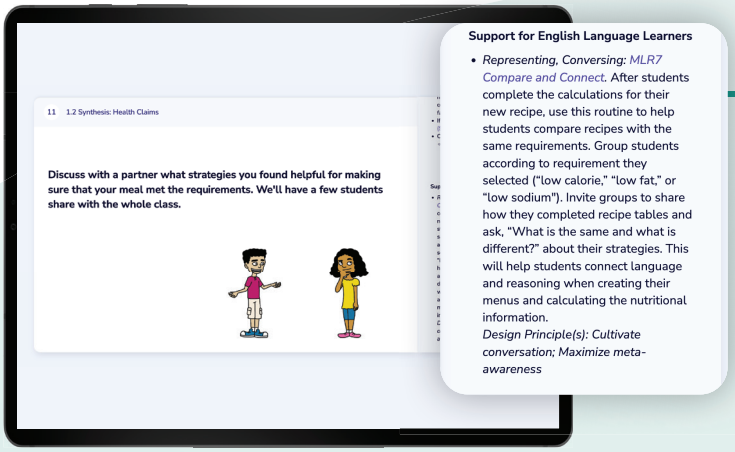
- *Conversing, Writing: MLR5 Co-Craft Questions.* Before revealing the questions in this activity, display only the image of the rectangular prisms. Invite students to work with a partner to write mathematical questions that could be asked about the prisms. Select 1–2 groups to share their questions with the class. Listen for and amplify questions about the lengths of the diagonals. For example, "What is the length of the diagonal of Prism *K*?" and "Which rectangular prism has the longer diagonal length?" If no student asks these questions, ask students to adapt a question to align with the learning goals of this lesson. Then reveal and ask students to work on the actual questions of the task. This routine will help develop students' meta-awareness of language as they generate questions about calculating the diagonal length of a rectangular prism.

Design Principle(s): Maximize meta-awareness

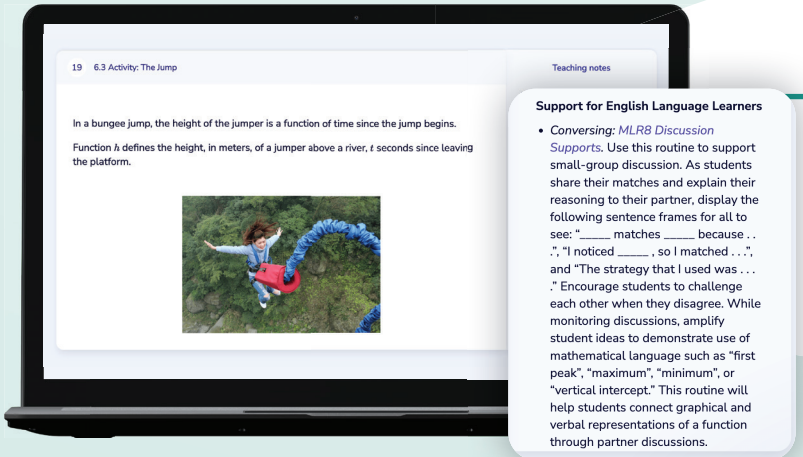
Through **MLR5: Co-Craft Questions**, students can use conversation skills to generate, choose, and improve questions and situations, allowing them to get inside a context before feeling pressure to produce answers.



In **MLR6: Three Reads**, students are supported in reading and interpreting a mathematical text, situation, word problem, or graph three times, each with a particular focus. This ensures that students know what they are being asked to do, creates opportunities for students to reflect on the ways mathematical questions are presented, and equips students with tools used to actively make sense of mathematical situations and information.



MLR7: Compare and Connect leverages the powerful mix of disciplinary representations available in mathematics as a resource for language development. In this routine, students make sense of others' mathematical strategies by relating and connecting them to their own.



MLR8: Discussion Supports include multimodal strategies for helping students make sense of complex language, ideas, and classroom communication. They support rich and inclusive discussions about mathematical ideas, representations, contexts, and strategies and can be combined and used together with any of the other routines.

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