Information Gap

(Math Language Routine 4 – MLR 4)

Background

The eight Math Language Routines, or MLRs, are part of the Illustrative Math® (IM®) K-12 Math curriculum. This curriculum has been adapted for adult learners and can be accessed on the PA Adult Education Resources website. The MLRs provide the chance for students to reason, communicate, and strengthen their understanding in a collaborative and supportive environment.

Zwiers et al. (2017) identify four design principles that guide mathematical language routines:

- Supporting sense-making
- Optimizing output
- Cultivating conversation
- Maximizing linguistic and cognitive meta-awareness

For more information, visit Math Language Routines: Discourse with a Purpose.

Purpose

This MLR facilitates the need for students to share information orally and visually to clarify and/or solve a problem.

Goal

- Using mathematical vocabulary, students ask questions, listen, and collaborate to solve a problem.

Audience

- Intermediate to advanced English learners
- English learners transitioning to adult basic education classes
- Adult basic education learners

Supported Standards for Mathematical Practice

- **Standards for Mathematical Practice 2**: Reason abstractly or quantitatively.
- **Standards for Mathematical Practice 4**: Model with mathematics.

Materials

- A problem or explanation of the current topic broken into steps or separate pieces of information
- Student template

Procedure

1. Create problem cards and data cards. Problem cards should include all of the information to solve the problem except the data or numbers required to find the solution. Data cards should include the numbers and data needed to solve the problem.
2. Distribute the cards.
3. Students work together to gather and organize the information.
4. Once students have accessed all of the information they need, they can solve the problem.
5. Students share their work.

Tips for Using this Routine

- Model the routine by demonstrating the process.
- Model how to ask for and share information, clarify questions and information, and collaborate to find a solution.
- This routine can be used to support instruction around the steps in a mathematical process, an explanation of a skill, or the information needed to solve a problem.
- Sentence stems can support students as they learn to ask questions. For example, “What is the volume of the rectangle?”
- If meeting in-person, you can provide information on notecards. If working virtually, you can provide the information on slides, Google Docs, or in breakout rooms.
- If you would like support with implementing this routine from an instructional coach, email dschauer@tiu11.org.

Reference

Zwiers, J., Dieckmann, J., Rutherford-Quach, S., Daro, V., Skarin, R., Weiss, S., & Malamut, J. (2017). *Principles for the design of mathematics curricula: Promoting language and content development*. Understanding Language/Stanford Center for Assessment, Learning, and Equity. https://ul.stanford.edu/sites/default/files/u6232/ULSCALE_ToA_Principles_MLRs__Final_v2.0_030217.pdf ul.stanford.edu