Stronger and Clearer Each Time
(Math Language Routine 1 – MLR 1)

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 helps students reflect on their thinking and consider others' perspectives. It builds skills in giving and using constructive feedback, strengthens listening abilities, and improves clarity and precision in communicating mathematical reasoning through revision and practice.

Goal

- This MLR provides a structure for students to refine their response to a prompt or problem through collaboration and peer feedback.

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 1**: Make sense of problems and persevere in solving them.
- **Standards for Mathematical Practice 3**: Construct viable arguments and critique the reasoning of others.
- **Standards for Mathematical Practice 6**: Attend to precision.

Materials

- A prompt or problem relevant to the current topic
- Student template

Procedure

1. Provide a relevant prompt or problem.
2. Individually, students spend two or three minutes writing or drawing their initial solution to the problem.
3. In pairs or small groups, students share their solutions and provide feedback to each other. Allow two or three minutes.
4. Individually, based on peer feedback, students revise their solution to the problem.
5. Repeat Steps 2 and 3 as often as needed.
6. As a full group, students discuss the solution to the problem.

Tips for Using this Routine

- Model the routine by demonstrating the process and thinking aloud.
- Model the routine by encouraging learners to provide additional information and clarification.
- Keep time during individual and group work.
- Support students to find partners.
- This routine can be adapted for virtual instruction using 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