Critique, Correct, and Clarify
(Math Language Routine 3 – MLR 3)

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 gives students the opportunity to analyze, reflect on, and correct a solution to a mathematical problem.

Goal

- Students will use a guided model to clarify, critique, and correct an incorrect 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 3**: Construct viable arguments and critique the reasoning of others.

Materials

- A problem and incorrect solution based on the current topic
- Student template

Procedure

1. Present a problem with an intentionally incomplete or incorrect solution.
2. Students work independently, in pairs, or in small groups to identify the error(s) in the solution.
    a. Clarify: Students work independently, in pairs, or in small groups to understand the reasoning in the provided sample response.
    b. Critique: Independently, in pairs, or in small groups, students analyze the incorrect response considering their own understanding to find the error(s) in computation.
    c. Correct: Independently, in pairs, or in small groups, students work together to fix the errors.
3. Students share their critiques, clarifications, and corrections.
4. As a class, revise the solution.

Tips for Using this Routine

- Be sure to "show the work" in the problem. As students analyze and reflect on the solution, they will be able to find the incorrect steps in the process.
- Model the routine by demonstrating the process.
- Model the routine by encouraging learners to provide additional information and clarification.
- Encourage accurate mathematical vocabulary.
- You can use Critique, Correct, and Clarify as an independent activity, in pairs or small groups, or as a large group or class.
- Critique, Correct, and Clarify can be adapted for virtual delivery 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