

Title: Incorporating Science Writing Framework Into Math Lessons**Grade Level: High School Geometry****Author: Zubin Hu**

Many people perceive math as a very abstract subject and think that learning math is just to memorize contents, formulae in particular. I've observed that some students have come to my classes from direct-instruction settings and expect their math teachers to just give them formulae so that they can just plug the information in to figure out the answer. Many students become so overwhelmed with certain problems that they barely try to solve them and often give up. Longer word problems are particularly problematic since they require students to reread them.

Research has shown that writing supports students' learning. It helps students connect what they read, understand and think and build stronger academic skills (Carr 2002). D. M. Gammill (2006) states, "The writing-to-learn approach can be used across disciplines to foster critical thinking skills." According to C. L. Martin (2015), students mainly use writing to demonstrate their computational skills rather than their conceptual understanding in traditional math classes. Writing is used as a mechanism to perform tasks such as taking notes, doing calculation on math assignments or tests. Under Common Core State Standards (CCSS), content area writing has become more prevalent.

Writing is a tool students can use for solving longer word problems. While reading research (Zemba-Saul, McNeill, and Hershberger 2013), I came across the CER (Claim, Evidence, Reasoning) framework that is widely adopted in Science classes for writing under Next Generation Science Standards. The primary goal of this Modified ETP with focuses on

Information Literacy and Communication is to apply writing using CER framework to solve word problems in math.

Fellowship Connection

My project is budget management. My partner and I work closely on a daily basis. We need to double check expenses for the previous two years using different resources, update any incorrect information on a spreadsheet, and write formulae to compute various values. We communicate with vendors to obtain quotes for the existing products and supports through emails and phone calls. We analyze the data on the spreadsheet separately, and then we compare our analysis. Lastly, we summarize the data and create PowerPoint presentations for different groups of audience. Written communication plays an important role in my Ignited fellowship. I plan to use this experience to introduce writing in math classes and guide students to use writing to make sense of and solve the real-world math problems.

ETP Deliverables (3 periods and each period is 50 minutes)

Day 1: Introduction of CER and writing using CER to solve word problems in math

Time	Lesson Activity
20 mins	Warm up and introduction to the concept - Mini-lesson on the CER framework
10 mins	Class discussion on writing in math (fellowship experience and connection during the first discussion session)
10 mins	Practice 1 (Solution) : working in pairs
6 mins	Go over the solution and answer students' questions, if any

4 mins	Students summarize their learning in writing (no specific prompt, no length requirement, will be collected)
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Day 2: Explore and practice writing using CER to solve word problems

Time	Lesson Activity
5 mins	Warm up: quick write on one event which math is used in daily lives
5 mins	Review Practice 1 (Solution)
10 mins	Converting CER graphic organizer into writing
8 mins	Practice 2 (Solution) : working individually to complete the CER graphic organizer
10 mins	Work in pairs to write a paragraph or paragraphs using their graphic organizers
8 mins	Student-led discussion on their writing
4 mins	Students reflect on their learning experience in writing (no specific prompt, no length requirement, will be collected)

Day 3: Solving math task using writing ([Individual formative task](#))

* Students answers vary. Use [grading rubric](#) to assess an individual's performance.

Time	Lesson Activity
5 mins	Warm up: quick write on questions students have on CER, writing, writing using CER in math.
5 mins	Have students share their questions and answer them
5 mins	Students will receive the task, read and writing down questions, if any
8 mins	Work in groups of 3 or 4 to ask and answer each other's questions
15 mins	Complete CER graphic organizer and write individually on Practice 3
7 mins	Peer editing: ask questions and provide feedback
5 mins	Revise and turn in the final version by the end of class

After the introductory stage of writing using CER to solve mathematical word problems, students will continue practicing on the concept periodically. At the end of the study, a [summative assessment](#) will be given to assess students' understanding on writing using CER in math. I will also conduct a [survey](#) to collect students' thoughts and feedback on the topic to inform my future practice.

Reference

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