Writing Counts

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The Beginning 1977

Janet Emig suggested that writing functioned as a unique and invaluable way for students to understand and integrate information.

"Writing as a Mode of Learning" (1977)

-Janet Emig

Why Writing?

- Writing provides an opportunity for students to sink their teeth into the marrow of math, so they will become more math minded.

- When writing is embedded throughout the curriculum, it promotes the brain's attentive focus to class-work and homework, boosts long-term memory, illuminates patterns, gives the brain time for reflection, and when well-guided, is a source of conceptual development and stimulus of the brain's highest cognition.

-- Judy Willis, MD.
"Brain-Based Benefits of Writing for Math and Science Learning" (2011)

Facilitate Meaningful Mathematical Discourse

What are teachers doing?	What are students doing?
Engage students in purposeful sharing of mathematical ideas, reasoning, and approaches, using varied representations.	Presenting and explaining ideas, reasoning, and representations to one another in pair, small-group, and whole class discourse.
Selecting and sequencing student approaches and solution strategies for whole-class analysis and discussion.	Listening carefully to and critiquing the reasoning of peers, using examples to support or counterexamples to refute arguments.
Facilitating discourse among students by positioning them as authors of ideas, who explain and defend their approaches.	Seeking to understand the approaches used by peers by asking clarifying questions, trying out others' strategies, and describing the approaches used by others.
Ensuring progress toward mathematical goals by making explicit connections to student approaches and reasoning.	Identifying how different approaches to solving a task are the same and how they are different.

Process Standards

- How do the standards support writing in math?

Students need to:

- Write to Learn
- Write to Respond
- Write for Assessment
- Write to Reflect
- Write to Plan

- Be afforded opportunities to share their ideas with others.
- Need feedback

Prove-it Paragraphs

- Begin with a declarative sentence (claim).
- Prove the sentence to be true.
  - **Example 1:**

    $2x + 8 = 16$; $x = 4$ **(Prove-it)**

  - **Example 2:**

    $x > 4$ **is a solution to** $2x + 8 > 16$ **(Prove-it)**

Chalk Talk

- Prompt is given
- Students respond in writing on their page
- 1st rotation – students can either respond to the original prompt or what the 1st group posted
- 2nd rotation – students can either respond to original prompt or what other groups have posted
- 3rd rotation – back to original poster – students read what others have posted

Chalk Talk continued

- Individual write time – answer the following prompts
- How did thinking change after reading other's responses
- What patterns did you notice
- Did anything surprise you?
- What did you learn?

I Use to Think, Now I Think

Reflection

- Need a plan for reflection and debrief
- Ideas for Reflection
  - What patterns have you noticed? Explain.
  - What part of the problem was the most difficult and why?
  - How can you solve the problem in another way?
  - How do you know your solution is correct?
  - How has your thinking solidified or changed?
  - How did you background knowledge help you with this problem?
  - What did you learn from your writing?
  - What did you learn from discussion with your classmates?