Characteristics of a Good Explanation

A good explanation is a description and justification of a process used to solve a mathematical exercise or problem that includes…

- **Naming quantities** and justifying why those quantities are named that way;
- The use of **class sanctioned methods** and an explanation for why those methods are appropriate;
- An appeal to **images** that relate how the methods are actually modifying the quantities;
- **Goal statements** that explain the purposes of the methods.
- An unbroken chain of **causal relations**.

Characteristics of a Problematic Explanation

- The explanation focuses largely on manipulating symbols and not developing meaning for the symbols and operations.
- Numbers are not explained. They are not linked to quantities. They are symbols to be manipulated.
- Operations are a set of steps used to manipulate numeric symbols. Procedures are used without explaining why they work or why they are appropriate.
- Symbols, equations, and pictures are used as if they are "transparent." They carry meaning that doesn't need to be explained, and that everyone just "sees."
- Unexplained "miracles" occur that magically transport you to the right answer.