

Framework of the G.I.S.D. Mathematics Curriculum

Teaching Mathematical Problem Solving

Critical Components include:

Concepts – described in the TEKS; Number and Operations, Algebraic Reasoning, Geometric Reasoning, Measurement, Probability and Statistics

Skills – described in the TEKS; estimation, approximation, mental calculation, communication, use of mathematical tools, arithmetic manipulation, handling data

Processes used in Problem Solving

- Develop problem analysis skills
 - analyze an unfamiliar problem
 - identify wanted and needed information
 - ignore nonessential information
 - clearly state the goal of the problem or task
- Develop and select strategies
 - acquire a collection of problem-solving strategies
 - select and use those strategies appropriately
- Justify solutions
- Extend and generalize problems
 - go beyond the solution to problems
 - consider results or process applied in other situations or used to form rules or general procedures

Metacognition - Habits of monitoring and regulating problem-solving activity

- Recognize when one is stuck or does not fully understand
- Make conscious decisions to switch strategies, rethink the problem, search for related content knowledge that may help, or simply start afresh

Attitudes toward mathematical problem solving

- Gain confidence and belief in abilities to do mathematics and to confront unfamiliar tasks
- Be willing to try and to persevere
 - attempt unfamiliar tasks
 - not be discouraged by initial setbacks
- Enjoy doing mathematics
 - sense personal reward in the process of thinking, searching for patterns, and solving problems