Reflective Writing Exercise

What is problem solving?

You will be sharing your idea(s) with the rest of us.

Heuristics (singular noun)

from dictionary.com...

"The study and application of heuristic methods and processes."

Heuristic (adjective)

"Of or relating to a usually speculative formulation serving as a guide in the investigation or solution of a problem."

Heuristic (adjective)

"Of or constituting an educational method in which learning takes place through discoveries that result from investigations made by the student."

What is a Problem?

Posamentier, Krulik, page 1

"A situation that confronts a person, that requires resolution, and for which the path to the solution is not immediately known."

A Situation

There is no implication of academia or academic connection to the word "situation." A true problem-solver will be using problem-solving methods almost continuously.

Requires Solution...

The most effective problem is one to which the "solver" can relate, and from whose solution the "solver" can realize benefit.

Path to Solution

There is a delicate balance between problem challenge, complexity, and solvability that can greatly affect whether a person will attempt to solve it.

Problem Solving Perspective

Our individual backgrounds and experiences have a direct impact on the method(s) we use when solving a problem.

What occurs when we encounter a problem that requires deeper consideration?

Procedural Instruction

Many times teaching skills to students, and reinforcing those skill with repetitive homework assignments, is easier and more comfortable in the classroom. There are fewer risks...

What about Tricks?

Part of the attraction to mathematics, as well as other subjects, is that it's specialized, and there are certain elements within it that pique curiosity. However, we must empower students to do original work, and not simply be able to understand what is presented to them.

Curious, isn't it?

Take your current age and add it to the age you will be next year at this time.

Multiply this sum by five.

Add the units digit of the year you were born to the previous result.

Subtract five from this value.

Is Logic Needed?

Three people, Alice, Bill, and Charlie, are blindfolded. The person supervising the blindfolding has five hats, three red and two white. She puts a hat on each of their heads.

Is Logic Needed?

Alice's blindfold is removed, and she can see the hats on Bill and Charlie's heads, but not her own. She states, "I cannot tell what color hat I'm wearing." Bill's blindfold is removed, and presently he makes the same remark.

Is Logic Needed?

Charlie, while still blindfolded, says, "I know which color hat I'm wearing!"

What color hat is Charlie wearing?

How did he figure this out?

Basketball Tournament

In college basketball, the final NCAA playoffs involve 64 teams, and it's a single elimination tournament. How many games are played before the champion team is determined?

Magic Square (not Sudoku!)

A box with nine spaces (3x3) is to be filled with the digits 1 through 9, each digit used once, so that the sum of each row, the sum of each column, and the sum of the two diagonals, is the same number. Complete such a "magic square."

Meeting Room Handshakes

Ten people enter the same room for a meeting. By way of polite introduction, each person shakes hands with every other person once. How many handshakes occur before the meeting?

Chapter 2
Working Backwards

The sum of two numbers is 2 and their product is 5. What is the sum of their reciprocals?

Chapter 2
Working Backwards

Working backwards is the essence of an indirect proof, which is often helpful in mathematics. We begin with a conclusion that we believe is false, and then work to establish a contradiction to known fact.

Assignment for 26 Jan 2009

- *Read chapter 2 of the textbook.*
- *Analyze the problems posed and solved (it is preferable to solve them before reading the solutions, if possible)*
- *Find (or create) two new problems that can be solved using this method, for presentation next week*
- *Problem of the Week*