**Problem Solving Definition Handout**

**Problem solving** is a mental process and is part of the larger problem process that includesproblem finding and problem solving. Considered the most complex of all intellectual functions, problem solving has been defined as higher-order cognitive process that requires the modulation and control of more routine or fundamental skills. Problem solving occurs when an organism or an artificial intelligence system needs to move from a given state to a desired goal state.

**Problem Solving Process:**

**1. UNDERSTANDING THE PROBLEM**

* Can you state the problem in your own words?
* What are you trying to find or do?
* What are the unknowns?
* What information do you obtain from the problem?
* What information, if any, is missing or not needed?

**2. DEVISING A PLAN**

* Look for a pattern.
* Examine related problems, and determine if the same technique can be applied.
* Examine a simpler or special case of the problem to gain insight into the solution.
* Make a table.
* Make a diagram.
* Write an equation.
* Use guess and check.
* Work backward.
* Identify a sub goal.

**3. CARRYING OUT THE PLAN**

* Implement the strategy or strategies in step 2, and perform any necessary actions or computations.
* Check each step of the plan as you proceed. This may be intuitive checking or a formal proof of each step.
* Keep an accurate record of your work.

**4. LOOKING BACK**

* Check the results in the original problem. (In some cases this will require a proof.)
* Interpret the solution in terms of the original problem. Does your answer make sense? Is it reasonable?
* Determine whether there is another method of finding the solution.
* If possible, determine other related or more general problems for which the techniques will work.

Resources:

Billstein, R., Libeskind, S., & Lott, J. (2010). *A Problem Solving Approach to Mathematics for* *Elementary School Teachers*. Boston: Addison-Wesley.