

PROBLEM SOLVING STRATEGIES

TACTIC	ACTIVITY	OUTCOME
CLARIFYING	Reread the problem as if you were editing it: analyze givens, make unstated assumptions explicit, clarify goals.	A restatement of the problems, its givens, assumptions, and goals in your own words
VISUALIZING	Draw a figure and label givens; close your eyes to form a mental picture; imagine what the experiment/problem would look like if you set it up in real life.	A diagram or model which should help you see relationships between givens and unknowns
ANALOGY	Use the text or notes to find a similar problem, method, result, useful theorem, or technique.	An example to follow in solving your problem
SUBGOAL	Break problem into similar problems; do only part of a problem.	Partial solutions leading towards goal
ALGEBRAIC	Introduce variables for an unknown; write equations, relations.	A symbolic representation of the problem
BRAINSTORMING	Think of every formula or definition related to the concept or terms.	A list of formulas, conversion factors, or definitions to be used
QUESTIONING	Assume you are going to ask the instructor for help: what would you ask? Identify what you need to know to solve the problem.	A list of questions whose answers lead to a solution
UNIT ANALYSIS	Compare units in answer you want to compute with units in given information; look for conversion factors involving these units.	Series of relationships involving units which can be multiplied or divided to get desired goal
IDENTIFYING	Identify the concept behind a problem, type of problem, and section of book from which you've taken the problem.	Once you know concept behind problem, you can use brainstorming, analogy, or other tactics
TEAM	Work with a classmate or friend.	A discussion of ideas that can lead to broader understanding
TRIAL & ERROR	Guess and check; try special cases.	Corrective feedback, better understanding of problem; may lead to induction
INDUCTION	Search for a pattern.	Generalizations and insights about problem
WORK BACKWARDS	Begin with answer if given, or approximate an answer, and try to figure out how it was obtained.	The process for solving the problem
LOOK BACK	Check and verify your work; is the solution reasonable?	Verification of solution
INCUBATE	Stop working on a problem, sleep on it, or leave it for a few hours if you are making no progress after 30 minutes.	Opportunity for insights and ideas to develop
GO FOR HELP	Ask for hints or explanations after you have tried all other tactics.	Obtaining insights and strategies required for solving the problem

Source: Frand, J. L. (1979). *How to study mathematics, chemistry, statistics, physics*. SKIL Publishing Company.

Revised: Summer 2014, Theresa Hoang

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