

NEW PROBLEM SOLVING TACTICS

TACTIC	ACTIVITY	OUTCOME
CLARIFYING	re-read the problem as if you were editing it: analyze givens, make unstated assumptions explicit, clarify goals	a re-statement of problems, its givens, assumptions, goals in your own words
VISUALIZING	draw a figure and label givens; close your eyes to form a mental picture and then imagine what the experiment would look like if you set up the equipment	figure, diagram, model which should help you see relationships between givens and unknowns
ANALOGY	recall or use the text or notes to find a similar problem, method, result, useful theorem technique	model to follow in solving your problem
SUBGOAL	break problem into similar problems; do only part of problem	partial solutions leading towards goal
ALGEBRAIC	introduce variables for unknown; write equations, relations	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 concept behind problem, type of problem, and section of book from which taken	once you know concept behind problem, you can use brainstorming, analogy or other tactics
TEAM	work with classmate, friend	discussion of ideas which can lead to broader understanding
TRIAL & ERROR	hit-miss attempts; try special cases	corrective feedback, better understanding of problem; may lead to induction
INDUCTION	try cases searching 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 solution reasonable	verification of solution
INCUBATE	if making no progress after 30 minutes, stop working on problem, sleep on it, or leave it for a few hours	opportunity for insights and ideas to develop
GO FOR HELP	after trying all other tactics, ask for hints or explanations	obtaining insights and strategies required for solving the problem

Source: Frand, Jason L. How To Study Mathematics Chemistry Statistics Physics., 1979.

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