

## PROBLEM SOLVING STRATEGIES

TACTIC	ACTIVITY	OUTCOME
<b>CLARIFYING</b>	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
<b>VISUALIZING</b>	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
<b>ANALOGY</b>	Use the text or notes to find a similar problem, method, result, useful theorem, or technique.	An example to follow in solving your problem
<b>SUBGOAL</b>	Break problem into similar problems; do only part of a problem.	Partial solutions leading towards goal
<b>ALGEBRAIC</b>	Introduce variables for an unknown; write equations, relations.	A symbolic representation of the problem
<b>BRAINSTORMING</b>	Think of every formula or definition related to the concept or terms.	A list of formulas, conversion factors, or definitions to be used
<b>QUESTIONING</b>	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
<b>UNIT ANALYSIS</b>	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
<b>IDENTIFYING</b>	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
<b>TEAM</b>	Work with a classmate or friend.	A discussion of ideas that can lead to broader understanding
<b>TRIAL &amp; ERROR</b>	Guess and check; try special cases.	Corrective feedback, better understanding of problem; may lead to induction
<b>INDUCTION</b>	Search for a pattern.	Generalizations and insights about problem
<b>WORK BACKWARDS</b>	Begin with answer if given, or approximate an answer, and try to figure out how it was obtained.	The process for solving the problem
<b>LOOK BACK</b>	Check and verify your work; is the solution reasonable?	Verification of solution
<b>INCUBATE</b>	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
<b>GO FOR HELP</b>	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.

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