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Examples of Problem Solving Strategies

Here are some problem-solving strategies that can be applied to a wide range of problems:

- **Define the problem**: Start by clearly defining the problem you are trying to solve. Identify the key issues and any constraints or limitations that may affect the solution.
- **Break it down**: Break the problem down into smaller, more manageable parts. This can make it easier to identify potential solutions and create a plan of action.
- **Brainstorm**: Generate as many ideas as possible, without evaluating them at first. This can help to expand your thinking and generate more creative solutions.
- **Evaluate solutions**: Evaluate the potential solutions based on criteria such as feasibility, effectiveness, and cost. Eliminate solutions that are not practical or do not meet the criteria.
- **Choose a solution**: Choose the best solution based on the evaluation criteria. It may be necessary to combine or modify solutions to create the best solution.

- **Create an action plan**: Create an action plan that outlines the steps needed to implement the solution. Identify any necessary resources, such as people, time, or money.
- **Implement the solution**: Follow the action plan and implement the chosen solution. Monitor progress and make adjustments as needed.
- **Reflect and learn**: After implementing the solution, take time to reflect on the process and evaluate the outcome. Identify any lessons learned and use them to improve future problem-solving efforts.

These strategies can be applied to a wide range of problems, from personal challenges to complex business issues. They emphasize the importance of clearly defining the problem, generating and evaluating potential solutions, and creating an action plan for implementation.

The following techniques are usually called problem-solving strategies:

- Abstraction: solving the problem in a model of the system before applying it to the real system
- Analogy: using a solution that solves an analogous problem
- Brainstorming: (especially among groups of people) suggesting a large number of solutions or ideas and combining and developing them until an optimum solution is found
- Critical thinking
- Divide and conquer: breaking down a large, complex problem into smaller, solvable problems
- Hypothesis testing: assuming a possible explanation to the problem and trying to prove (or, in some contexts, disprove) the assumption
- Lateral thinking: approaching solutions indirectly and creatively
- Means-ends analysis: choosing an action at each step to move closer to the goal
- Method of focal objects: synthesizing seemingly non-matching characteristics of different objects into something new
- Morphological analysis: assessing the output and interactions of an entire system
- Proof: try to prove that the problem cannot be solved. The point where the proof fails will be the starting point for solving it
- Reduction: transforming the problem into another problem for which solutions exist
- Research: employing existing ideas or adapting existing solutions to similar problems
- Root cause analysis: identifying the cause of a problem
- Trial-and-error: testing possible solutions until the right one is found

Method	Description	Example
Trial and error	Continue trying different solutions until problem is solved	Restarting phone, turning off WiFi, turning off bluetooth in order to determine why your phone is malfunctioning
Algorithm	Step-by-step problem-solving formula	Instruction manual for installing new software on your computer
Heuristic	General problem-solving framework	Working backwards; breaking a task into steps

Over Fifty Problem-Solving Strategies Explained

- **Strategies to help you understand the problem**
  - Clarify the problem
  - Identify key elements of the problem
  - Visualize the problem or a relevant process or situation
  - Draw a picture or diagram of the problem or a relevant process or situation
  - Create a model of the problem or a relevant process

    - Imagine being the problem, a key process, or the solution
    - Simulate or act out a key element of the problem
    - Consider a specific example
    - Consider extreme cases
    - Acquire knowledge of relevant domains
    - Change perspective
    - Consider levels and systems
- **Strategies to help you simplify the task**
    - Solve one part at a time
    - Redefine the problem
- **Strategies to help you determine the cause of the problem**
    - Collect information about what happens before, during, and after the problem
    - Organise information into a table, chart, or list and look for a pattern
    - Try to make the problem worse
    - Compare situations with and without the problem
    - Consider multiple causes and interactions
    - Consider non-linear effects
- **Strategies involving the use of external aids to help you identify possible solutions**
    - Ask someone, especially an expert
    - Seek the answer in written material
    - Use a tool or technology
    - Apply a theory
    - Apply the scientific method
    - Use mathematics
    - Use a formula
- **Strategies involving the use of logic to help you identify possible solutions**
    - Reason by analogy in using what you have learned about similar problems
    - Use deductive reasoning
    - Use inductive reasoning
    - Question assumptions
- **Strategies using a possible solution as a starting point to help you solve a problem**
    - Guess, check, and adjust
    - Work backward
- **Strategies to help you determine which possible solution is best**
    - Estimate the likely costs and benefits of possible solutions
    - Choose one or more options to implement
    - Implement the best solutions and collect information about the effects of it
- **Strategies using geometry for problem solving**
    - Do the opposite of what you have been doing
    - Try a totally different approach
- **Strategies to help you function optimally while problem solving**
    - Think of options without immediately evaluating them
    - Set a goal with a purpose you value
    - Avoid distraction
    - Work in a new setting
    - Adjust time limit to optimum
    - Work with someone
    - Create a positive mood with an optimum arousal level
    - Think of the problem as a challenge or opportunity

    - Think confidently
    - Take a break
    - Persist
- **Strategies to help you solve multiple problems**
    - Adopt a problem solving orientation
    - Apply triage
    - Solve one problem at a time

— John Malouff, Ph.D., J.D

External links:

- https://ccmit.mit.edu/problem-solving/ (page 7)
- https://en.wikipedia.org/wiki/Problem_solving#Problem-solving_strategies
- https://nzmaths.co.nz/problem-solving-strategies
- https://toggl.com/blog/problem-solving-strategies
- https://blog.une.edu.au/usingpsychology/2018/10/15/over-fifty-problem-solving-strategies-explained/
- https://en.wikipedia.org/wiki/Problem_structuring_methods
- https://en.wikipedia.org/wiki/Information_mapping

Related:

• 5 Why	problem, method, rca
• A3	problem, method, rca
• Collective problem solving	problem, strategy
• Design Thinking	problem, dx, dt
• Fishbone	problem, method, rca
• Root Cause Analysis (RCA)	problem, strategy
• Six Thinking Hats	problem, method