

Problem solving is considered the most complex of all intellectual functions (Wikipedia). It occurs if one or more people do not know how to proceed from a one situation to another. Problem solving is used systemically in disciplines like engineering, but is also used by everyone, nearly every day, when faced with challenges.

**1. Define the problem.** First, define the problem you want to solve; come up with a 'problem statement.' Often people keep the problem in their head as a vague idea and get lost in what they are trying to solve. Merely writing down the problem forces you to think about what you are actually trying to solve. The first part of the process not only involves writing down the problem to solve, but also checking that you are answering the right problem. This ensures you do not answer a side issue or only solve part of the problem. People often use the most immediate solution to the first problem definition that they find without spending time ensuring the problem is the right one to answer.

To help fully describe the problem, answer these questions (these sound trivial, but they can be very helpful): Where is it happening? How is it happening? When is it happening? Why is it happening? With whom is it happening? (HINT: Don't jump to "Who is causing the problem?" When we're stressed, blaming is often one of our first reactions. To be an effective manager, you need to address issues more than people.)

**2. Analyze the problem.** Now that the problem is defined, analyze it to see what the root cause is. Often people get caught up in symptoms or effects of a problem or issue and never get down to the real cause. They get mad at someone's attitude, anger, or actions, which are not the cause of the problem. The key here is to focus everyone's efforts on analyzing the problem for the real cause. Once the cause is found, plans can be made to fix it. Analyzing means to gather information. If there is not enough information, figure out how to research and collect it. Try to come to consensus on why the particular problem or issue occurs. After this investigation, it is often good to go back one step to reconfirm that your problem definition is still valid.

**3. Generate possible solutions.** When you have discovered the real problem that you want to solve and have investigated the climate into which the solution must fit, the next stage is to generate a number of possible solutions. At this stage you should concentrate on generating many solutions and should not evaluate them at all. This is the time to brainstorm to generate a variety of different solutions. Bring in others that a different perspective to get unique ideas. Very often an idea, which would have been discarded immediately, when evaluated properly, can be developed into a superb solution. Don't pre-judge any potential solutions; instead treat each idea in its own right.

With each solution, list the assumptions you made that would allow that solution. You may need money, people, approval of someone not present, etc.

**4. Analyze the solutions.** List the strengths and weaknesses for each solution. Put yourself in the shoes of the person or group that will live with the solution to describe these strengths and weaknesses.

**5. Select the best solution(s).** Review the influencing factors for each possible solution. Decide which solutions to keep and which to disregard. You can use a grading system to prioritize solutions, or consult subject matter experts, or use feelings and intuition to decide. Another method for groups is to vote to produce a prioritized list of the solutions. Remember to review the assumptions for each solution. Your judgment may be affected by the expense, riskiness, etc. for each.

You will then end up with a rank-ordered list of solutions. If your solutions are presented to a decision maker, clearly define the problem, then state the definition of each solution and why each has the priority it does. State the solution you recommend. Decision makers may come up with a hybrid solution you had not envisioned.

**6. Develop a course of action for the final solution.** In your course of action include: 1) problem statement, 2) solution statement, 3) secondary effects of implementing this solution, 4) task list to implement the solution (include the person for each task, and when it should be done or reviewed), and 5) management review schedule to do two things: make sure the solution is on track (get leadership's help), and to adjust the resources required to finally accomplish the solution.