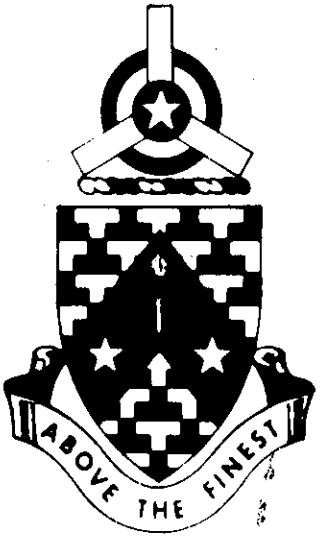
PROGRAMED TEXT

CREATIVE PROBLEM SOLVING

and

SOLUTION REPORTING



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UNITED STATES ARMY

PRIMARY HELICOPTER SCHOOL

FORT WOLTERS, TEXAS

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3825TH SUPPORT GROUP (ACADEMIC)

AIR UNIVERSITY

MAXWELL AIR FORCE BASE

PROGRAMED TEXT

PROGRAM TEXT

FILE NO:

PROGRAM TITLE

Creative Problem Solving
and
Solution Reporting

POI SCOPE: A systematic application of the six steps of problem solving and the format of the staff study: the report used by the military to present the problem and recommended solution.

INSTRUCTOR REFERENCES:

FM 101-5

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PREFACE

Have you ever been given a problem to solve and didn't exactly know how to go about it? Or, have you gone through the process of solving a problem and been asked to put all of the information relative to the problem, including your solution, on paper in logical format? This program is designed to help in both of these situations.

Read the performance objective on page 1, then work both parts of the text. A Self Evaluation Exercise has been provided for you to test yourself upon completion of the program text.

Turn the page and begin.

CREATIVE PROBLEM SOLVING AND SOLUTION REPORTING
PERFORMANCE OBJECTIVES

Upon completion of this text and without the aid of notes or reference material, you will:

1. Identify the 3 elements of a problem.
2. Match the 4 barriers to creative thinking with examples of each.
3. Identify the 3 ways in which a tentative statement of a problem can be expressed.
4. Match the 6 steps of problem solving with statements concerning or describing each step.
5. Identify brainstorming.
6. Select examples for each of the rules for brainstorming.
7. Match each of the 6 sections of a staff study report with examples and/or statements describing them.
8. Identify the correct procedure for reporting a problem solution to the commander.
9. Identify the use of attachments to a staff study report.

PART I
INTRODUCTION TO PROBLEM SOLVING

How do you define a problem? Here are some possible definitions. Read each of them, and indicate the response of your choice by placing a check mark (✓) in the space provided.

/✓/ 1. A problem is a question raised for inquiry, consideration, or solution.

/___/ 2. A problem is an unsettled question.

/___/ 3. A problem is a source of perplexity or vexation.

Which response did you select? Although each of them describes a problem differently, all of them are equally correct. This is because:

1. A problem must have been arised for consideration in order to qualify as a problem.

2. A problem is, by its very nature, an unsettled question. If it has been settled, it no longer qualifies as a problem.

3. Problems, because they are problems, are perplexing.

Why is it that problems are so perplexing? Check the response of your choice.

/___/ 1. Problems are perplexing because they are inherently difficult to solve.

/✓/ 2. Problems are perplexing because they stand between us and some goal.

There is nothing inherently difficult about solving problems. Sure, some problems are more difficult to solve than others, but this is because some problems are more complex than others. It is not because the problems themselves resist being solved. When a problem appears to be resisting solution, it is usually the fault of the problem solver who is resisting the application of the correct problem solving technique.

The existence of a problem is concrete evidence of the existence of some obstacle between an individual and a goal. We do not, however, solve obstacles. We solve the problems that are associated with the existence of obstacles.

Which of the following situations illustrates the existence of a problem? Check the response of your choice.

/___/ 1. An individual An obstacle No defined goal

/✓/ 2. An individual An obstacle A defined goal

/___/ 3. An individual No obstacle A defined goal

When the goal has not been determined, as in the first choice, there can be no problem because an obstacle cannot exist when the goal has not been defined. If there is no obstacle between the individual and his goal, as in the third choice, there can be no problem. It is only when an obstacle stands between an individual and his goal, as in the second choice, that a problem exists.

In the spaces that follow, we want you to list the three essential elements of every problem situation.

1. _____
2. _____
3. _____

The correct response is obvious. The three essential elements of any problem situation are the individual, the obstacle, and the goal. If you are to correctly identify the problem that requires a solution, it is absolutely essential that you correctly identify these three elements of the problem situation.

In the following narrative, see if you can correctly identify the individual, the obstacle, and the goal.

> As you drive to work each morning, you are confronted with intensely heavy traffic at the corner of Fourth and Elm. On several occasions, this has caused you to be late for work. Your supervisor is unhappy with you, and you are in danger of losing your job because of your chronic lateness.

We are not going to ask you to list the individual, the obstacle, and the goal, but they are all there. Did you spot them? We are going to ask you, however, if you can identify the problem in the preceding narrative. When you think you have the problem identified, check the response of your choice.

/V/ 1. The problem is how to get to work on time.

/___/ 2. The problem is how to ease the traffic congestion at Fourth and Elm Streets.

How did you respond? Did you select the traffic congestion at Fourth and Elm as the problem to be solved? If you did, you made the deadly mistake of confusing the obstacle with the problem. As is the case with other obstacles, it is probably far beyond your ability to ease the traffic congestion at Fourth and Elm. Remember, we do not solve obstacles. We identify the obstacles, and we solve the problems arising from the existence of these obstacles.

What about the other choice, "How to get to work on time?" Is that the problem? It might be, but don't count on it. At this point in the problem solving process, you may find it necessary to tentatively identify the problem as how to get to work on time, but be ready to restate the problem, because it may turn out to be "how to keep the boss happy" or "how to avoid being fired."

We can only tentatively identify the problem in the preceding narrative at this time. Why is this so? Check the response of your choice.

/___/ 1. Because the narrative is misleading.

/✓/ 2. Because there is not enough data.

The correct response is that there is not enough data. In the narrative, we said practically nothing about the individual with the problem, we described the obstacle in a very general way, and we referred to the goal only indirectly. No, you need much more data than that if you are to correctly identify the problem. How do you go about assembling this additional data?

To begin, you would get a significant part of this required data from an analysis of the total problem environment. The total problem environment consists of these three parts:

1. An individual,
2. An obstacle, and
3. A goal.

In order to assemble the data necessary for the correct identification of the problem, you must analyze and interpret the relationship of these three parts.

Suppose that you are the individual with the problem. Which of the following best describes the type of analysis that you should conduct?

/___/ 1. I would begin with an analysis of the obstacle that is interfering with goal accomplishment. After determining the way in which the obstacle is interfering, I would gather enough additional data to enable me to correctly identify the problem. When I had the problem correctly identified, I would find a solution to it.

/✓/ 2. I would begin the analysis with an examination of my own frame of reference and the way in which this frame of reference might affect the problem solution. I would then examine the goal and the obstacle in the same way in order to determine how these parts of the problem environment will affect the problem solution. Only then would I attempt to identify the problem.

Don't be guilty of attempting to solve problems in the way described in the first choice. To do so means that you believe that a problem situation involves only an obstacle and a resulting problem. Nothing could be further from the truth. Even when the individual is you and the goal is your own, there is much to be learned about these parts of the problem environment, and only a comprehensive analysis of the total problem environment will reveal these things to you.

There is no single way to solve problems, but there is a best way. On the pages to follow, we present a technique of problem solving which, if correctly applied, will make you a better problem solver than you now are.

A TECHNIQUE OF PROBLEM SOLVING

A "TECHNIQUE" is a systematic method of accomplishing a desired aim. The technique of problem solving that we present here requires the systematic application of six consecutive steps. To begin this presentation, we shall present all of these steps together so that you can see how they relate to one another. After you have seen the steps together in this fashion, we shall go into each of them in more detail so that you can see all of the separate tasks required by each step.

Here are the six steps in scrambled order. Can you, without looking ahead in the text, place them in their correct order of application? Since we have already talked at length about step one, you should have no trouble getting started.

1 Select the best solution to the problem

2 List possible solutions to the problem

3 Recognize the problem

4 Implement the problem solution

5 Gather data relative to the problem

6 Test possible solutions to the problem

The sequence in which these steps should be applied to a problem solution is as follows:

Step one is 3

Step two is 5

Step three is	2	4	2	2
Step four is	6	2	4	4
Step five is	4	6	4	1
Step six is	4	1	1	6

Here are the steps arranged in the order in which they are applied to a problem solution.

Step one is recognize the problem.

Step two is gather data relative to the problem.

Step three is list possible solutions to the problem.

Step four is test possible solutions to the problem.

Step five is select the best solution to the problem.

Step six is implement the problem solution.

We have already seen, in the introduction to this text, that it is sometimes difficult to accomplish step one of this sequence. This is because we often confuse the obstacle with the problem, or it is because we do not have enough data. We saw, however, that a thorough analysis of the total problem environment will go a long way in making the task of recognizing the problem much easier.

Would you say that this analysis of the total problem environment has an effect on the remaining steps of the problem solving sequence? Read each of the following paragraphs, and decide if what we say in these paragraphs concerning steps two through six of the problem solving sequence is true. When you have decided, make the responses that are required after each paragraph.

Step two is gather data relative to the problem. Problem solving involves the use of facts relative to the problem situation. These are facts that the problem solver already knows, or they are facts that he can accumulate. Your analysis of the total problem environment will assist you in determining how much and what type of research will be required to fill the gaps in your knowledge.

Select one of the following responses concerning the validity of the preceding paragraph.

/X/ 1. The analysis of the total problem environment will affect step two of the problem solving sequence in a way similar to that described.

/ / 2. The analysis of the total problem environment will not affect step two of the problem solving sequence in the manner described.

The first choice above is the correct response. Your analysis of the total problem environment will inevitably indicate those areas in which your knowledge is deficient. It will also provide you with valuable guidance for whatever research is required.

Step three is list possible solutions to the problem. The best possible solution to any problem can only be derived after the consideration of several alternative solutions. In order to prepare a list of acceptable alternatives, the problem solver must know the possible effects of the alternative solutions on the obstacle, on the goal, and on himself. These possible effects can only be evaluated on the basis of what is known about the three elements of the problem environment, and only an analysis of the total problem environment will provide this information.

Select one of the following responses concerning the validity of the preceding paragraph.

/X/ 1. The analysis of the total problem environment will affect step three of the problem solving sequence in a way similar to that described.

/ / 2. The analysis of the total problem environment will not affect step three of the problem solving sequence in the manner described.

The first choice above is the correct response. "Know thyself" is an excellent piece of advice in determining what constitutes a possible solution to a problem. Your frame of reference and your goals will not tolerate certain solutions.

Step four is test possible solutions to the problem. The way in which we determine whether or not a possible solution is acceptable is to put that solution to a test. This test consists of applying such criteria as economy, suitability, and feasibility. Certain aspects of criteria such as these can be highly subjective and hence not always readily apparent, and it is only through our analysis of the total problem environment that we can determine these subjective criteria.

Select one of the following responses concerning the validity of the preceding paragraph.

/X/ 1. The analysis of the total problem environment will affect step four of the problem solving sequence in a way similar to that described.

/ / 2. The analysis of the total problem environment will not affect step four of the problem solving sequence in that manner described.

The first choice above is the correct response. It is only through a thorough analysis of yourself and your goals that you can determine a subjective criterion such as suitability. Without these criteria, you cannot hope to put the alternative solutions to a test.

Step five is to select the best possible solution to the problem. "The best possible?" Of course, the best possible solution is that solution which meets most of the criteria. This selection process cannot be accomplished unless all of your criteria are valid. The criteria cannot be valid unless they are based on a thorough analysis of the problem solver, the obstacle, and the problem solver's goal.

Select one of the following responses concerning the validity of the preceding paragraph.

/✓/ 1. The analysis of the total problem environment will affect step five of the problem solving sequence in a way similar to that described.

/___/ 2. The analysis of the total problem environment will not affect step five of the problem solving sequence in the manner described.

The first choice above is the correct response. You test the possible solutions for the purpose of arriving at a single solution that meets most of the criteria. If the criteria are faulty because they are invalid or incomplete, you cannot expect your chosen solution to be the best solution to the problem. One sure way to invalidate your criteria is to fail to consider all aspects of the problem environment.

Step six is to implement the problem solution. Your analysis of the total problem environment will have revealed much about the ability and the authority of the problem solver to implement the problem solution. This analysis will also have indicated the need for funds, manpower, equipment, training, etc. that the implementation of the solution will require.

Select one of the following responses concerning the validity of the preceding paragraph.

/✓/ 1. The analysis of the total problem environment will affect step six of the problem solving sequence in a way similar to that described.

/___/ 2. The analysis of the total problem environment will not effect step six of the problem solving sequence in the manner described.

Well, if you are not convinced by now that it is imperative for you to analyze the total problem environment, we don't know what it will take to convince you. The ease with which you can apply the six steps of the problem solving sequence will be determined, to a great extent, by your thoroughness in analyzing the three elements of the problem environment: the individual, the obstacle interfering with goal accomplishment, and the individual's goal.

On the pages to follow, we shall examine the six steps of the problem solving sequence, and we shall see how each of these steps contributes to the final solution of the problem.

STEP ONE -- RECOGNIZING THE PROBLEM

This first step in problem solving, that of correctly identifying the problem, is so critical to the problem solving process that it is the first step in ALL recognized techniques of problem solving. To identify the problem incorrectly and then to spin your wheels working on a solution to the wrong problem is probably the greatest sin of problem solving.

Here is a short narrative that we want you to read carefully. When you have read it, go on to the discussion that follows. Make all of the required responses.

> Captain Jones came charging into his office one morning with the following statement: "Man, do I have a problem. I have to get in my required minimums in flying this month, I have only three days in which to do it, and now I won't be able to hack it. I have a car payment to make, and I won't be able to pay it if I don't get that flying pay."

If we were to examine the set of conditions about which Captain Jones was speaking, how could we know that Captain Jones has a problem? To be sure, Captain Jones says he has a problem, but how could we be sure that he has?

If you will remember, a problem situation must have three elements; otherwise, there is no problem. What would you look for in the preceding narrative to determine if Captain Jones really does have a problem? Check the response of your choice.

/X/ 1. I would look for an individual, a goal, and an obstacle interfering with goal accomplishment.

/ / 2. I would look for the underlying cause of Captain Jones' apparent concern.

The first response is the one we were after. If these three elements exist, then we can be sure that Captain Jones really does have a problem. Do you agree, then, that Captain Jones really does have a problem? See if you can tentatively identify the problem in the following alternatives. Check the response of your choice.

/ / 1. Captain Jones' problem is his inability to qualify for flying pay this month.

/X/ 2. Captain Jones' problem is his inability to get in the required minimum flying time.

/X/ 3. Captain Jones' problem is his inability to meet his monthly car payment.

The response that we hope you selected for your tentative identification of the problem was number three. The other two choices could be more properly called obstacles standing between Captain Jones and his goal of making the car payment on time. Why do we classify them as obstacles instead of problems? Suppose you tell us. Put yourself in Captain Jones' place, and check the problem below that you would feel most qualified to solve.

/___/ 1. How to qualify for flying pay this month without meeting the minimum requirements.

/X/ 2. How to make the monthly car payment without collecting flying pay.

/___/ 3. How to get in the required minimums in spite of those things preventing it.

Do you see the magnitude of problems one and three above? The second choice above may require nothing more than a trip to the Credit Union, while the first and third choices may be imposible to solve.

Here is another exercise in the tentative identification of a problem. Read the following narrative carefully, and see if you can determine what the problem is from the information that is presented.

> From the post semi-annual expense accounting, the post commander has determined that the cost of power mower maintenance for the first six months of the current fiscal year is 40 percent higher than the cost of mower maintenance for the first six months of the previous fiscal year. The commander has directed you, the Post Engineer, to cut the cost of mower maintenance to a level that will insure that this year's total maintenance cost will not exceed last year's total cost.

Can you tentatively identify the problem from that narrative? Select one of the following responses.

/___/ 1. The problem can be tentatively stated as "to find ways to reduce the cost of mower maintenance."

/X/ 2. There is not enough data available to tentatively identify the problem.

/___/ 3. There is no problem suggested in the narrative.

The correct response is choice number two. If you selected the first response, then you have oversimplified the difficult task of recognizing the problem. In doing so, you have overcomplicated the search for a solution.

No, we cannot identify the problem as yet. We do not have the complete picture of the total problem enviroment. You determine what part of the problem environment is missing by completing the following blanks.

1. The goal is to keep cost below last years.

2. The person desiring to reach the goal is post Engineer

3. The obstacle interfering with goal accomplishment is _____

For the goal, you should have entered the reduction in maintenance costs that the commander requires. This would be phrased in your own words, of course.

For the person desiring to reach that goal, you should have entered yourself as Post Engineer. We hope that you remembered to add that you are a conscientious officer who will get the costs down and still get the grass cut. This is the sort of evaluation that is so critical to the choice of the final solution.

What is the obstacle that is interfering with goal accomplishment? At this point, who knows? It may be that the operators are abusing the equipment, or it may be that the mowers are so old that they cannot be economically repaired.

Let us suppose, for the sake of our discussion, that you conduct an investigation of the mower maintenance costs, and you determine the following:

1. The equipment is experiencing more major breakdowns this year than was the case last year.
2. Although some operators are abusing the equipment, this is only one of the causes of the breakdowns.
3. Parts from supplies have increased significantly in cost.

With this additional data, can we identify the obstacle now? See if you can complete the following:

1. The goal is to reduce the cost of mower maintenance to last year's level.
2. The person desiring to reach the goal is you, a conscientious Post Engineer who will reduce costs and get the grass cut.
3. The obstacle is _____

The obstacle you should have identified was that of more major breakdowns of equipment (caused by a variety of reasons) and the increased costs associated with these breakdowns.

With this analysis of the total problem environment, you should now be able to tentatively identify the problem, and you should be able to develop a tentative statement of the problem. Why is a tentative statement of the problem needed at this time? Answer this question by selecting one of the alternatives below.

/___/ 1. Once a tentative statement of the problem is developed, you are ready to select and to implement the problem solution.

/✓/ 2. The development of a tentative statement of the problem forces you to reevaluate the total problem environment in the context of this statement.

The correct response is number two. This evaluation of the tentative statement of the problem in the context of the total problem environment helps you to relate the problem to a cause instead of to an effect. In many instances, when we fail to relate the problem to a cause, our efforts toward finding a solution will be misdirected to treating the effects of a problem. Preventing this misdirection is the primary reason for developing a tentative statement of the problem at this early stage of the game.

Let us suppose that you have tentatively identified the problem as one of reducing major breakdowns. You may have to make a tentative statement of the problem. This statement must be phrased in on of three ways:

1. As a question. "How can we . . .?"
2. As a statement of need. "We need to . . . ."
3. As an infinitive phrase. "To find ways to . . . ."

To state a problem in one of these three ways in a part of the systematic approach to problem solving. Any one of these three statements will serve as a definite guide for your research in the "gather data" phase to come.

In the spaces to follow, make a tentative statement of the power mower problem in each of the three ways that we have specified.

1. As a question. how can we lower maintenance cost.

2. As a statement of need. we must lower maintenance cost

3. As an infinitive phrase. to lower maintain cost is necessary.

With the tentative statement of the problem behind us, we have completed step one, recognizing the problem. We may have to return to this step if we find that our statement of the problem requires revision, but we can leave the step for now.

Before going on to the second step of the problem solving sequence, lets have a brief review of the material covered to this point. In this review, make all of the responses that are required.

Which of the following actions must we accomplish if we are to correctly identify the problem? Check the response of your choice.

/___/ 1. Conduct a thorough analysis of the goal that is being interfered with.

/_✓_/ 2. Conduct a thorough analysis of the total problem environment.

/___/ 3. Conduct a thorough analysis of the obstacle that is interfering with goal accomplishment.

The correct response is number two.

When the total problem environment has been analyzed, and the problem has been tentatively indentified, the next step is to do which of the following?

/___/ 1. Seek an acceptable solution to the problem.

/_✓_/ 2. Develop a tentative statement of the problem.

The correct response is number two.

The tentative statement of the problem should be in the form of which of the following?

/_✓_/ 1. A question, a statement of need, or an infinitive phrase.

/___/ 2. A short summary paragraph outlining the problem.

The correct response is number one.

This completes the review of step one. Before going on to step two, let us leave you with this thought. Here is a tentative statement of the power mower problem. There is something wrong with this statement. Examine it carefully, and select one of the choices below that best describes this fault.

To find ways to reduce mower breakdowns

/_✓_/ 1. The phrasing of the statement is not consistent with the rule which states that the tentative statement of the problem must be phrased as a question, as a statement of need, or as an infinitive phrase.

/_✓_/ 2. The phrasing of the statement leaves the problem much too broad to be dealt with effectively. The problem should be limited in size, and this statement of the problem does not accomplish that.

Which of the above choices did you select? Number two is the correct choice. It is a valid criticism of the tentative statement of the problem as you will soon see.

On the following page, we go into the second step of the problem solving sequence, gathering data relative to the problem.

STEP TWO--GATHERING DATA RELATIVE TO THE PROBLEM

Note the words "gathering data" in the title above. These words would seem to indicate that it is in this second step of the problem solving that we first turn our attention to gathering data. This is not the case at all. We have already been involved in the process of gathering data when we made our analysis of the problem environment in the preceding step.

Which of the following statements is the more accurate description of this step of the problem solving sequence?

/___/ 1. The gathering data step of the problem solving sequence follows the step in which we tentatively identified the problem and prepared a short tentative statement of the problem. This step, gathering data, represents the first opportunity in the problem solving sequence to accumulate facts relative to the problem.

/X/ 2. The gathering data step of the problem solving sequence follows the step in which we tentatively identified the problem and prepared a short tentative statement of the problem. This process of gathering data began when we first analyzed the total problem environment, and it will continue throughout the problem solving sequence.

The correct choice is number two. Gathering data is a continuing process that begins with the recognition that an obstacle exists, and it continues up to the time that the final solution is implemented.

The data that the problem solution requires may be classified as the following:

1. Facts,
2. Assumptions,
3. Criteria, and
4. Definitions.

While all of these four types of data are important, two of the above types are more important to the problem solving process than the other two. Do you know what these two types are? Complete the following statements.

One of the above types of data is important because this type of data represents the truths upon which your solution to the problem is based These truths are classified above as facts.

Another of the above types of data is important because this type of data defines the limits within which your solution to the problem must fall. These solution limits are classified above as criteria.

Your first response should have been facts, and your second response should have been criteria. These two types of data are the foundation stones of your problem solution.

The following statements are both facts and criteria as they relate to the power mower situation. Following each of the statements, you will find a blank. Read each statement, and write in the blank whether you believe that statement to be a fact or a criterion.

1. The total cost for post lawn mower maintenance for fiscal year 1966 was $855.00. fact

2. The total cost for lawn mower maintenance for fiscal year 1967 must not exceed $855.00. criteria

3. Irrespective of the financial restrictions placed on power mower maintenance, the grounds must be maintained. criteria

4. The cost of mower maintenance for this post for the first half of fiscal year 1967 was $589.00. fact

5. The average cost of mower maintenance for six other posts of equivalent size during fiscal year 1966 was $601.75. fact

6. All money spent on mowers during fiscal year 1967 must be for maintenance since there are no funds to buy new equipment. criteria

Your responses to the above statements should be as follows:

1. Fact
2. Criterion
3. Criterion
4. Fact
5. Fact
6. Criterion

Here is another piece of data. How would you classify it?

If the present trend in maintenance costs continues, the cost for Fiscal Year 1967 could exceed $1200.00.

The above statement is which of the following?

/___/ 1. A fact

/_X_/ 2. An assumption

/___/ 3. A criterion

/___/ 4. A definition

The statement above is an assumption. An assumption is a statement that may or may not be true, as is the case with the statement above, but the available facts indicate that it is true, or that it will be true.

How would you classify this piece of data?

A linket bracket is a mechanical device that automatically disengages the cutting blades when the operator's brain is not in gear.

The above statement is which of the following?

/___/ 1. A fact

/___/ 2. An assumption

/___/ 3. A criterion

/_X_/ 4. A definition

Definitions, such as the above, are required when you are preparing a report of your final solution, and this report contains words or terminology that might be unfamiliar to your reader.

Because of the importance of facts and criteria to your problem solution, we shall cover these in a little more detail before going on to the third step in the problem solving sequence.

We have already seen that the accumulation of facts relative to the problem situation begins with the first step of the problem solving sequence, and it continues through this step. To this point, where would you guess that most of the facts have come from?

/___/ 1. From the observation of an expert.

/_X_/ 2. From your own experience.

The most available source of ~~factual~~ data will always be your own experience. Whether or not you realize it at the time, there will be few problems that you are called upon to solve about which you do not already have a tremendous store of knowledge. Is this equally true of the criteria? Do most of the criteria for a problem solution come from the problem solver, or do they come from some outside source? Check one of the following responses.

/___/ 1. The criteria for a problem solution are always provided in complete form by a superior when the individual is assigned the problem to solve.

/___/ 2. The criteria for a problem solution are usually inherent in the nature of the obstacle causing the problem. The obstacle can only be overcome within certain physical limits, and these limits will establish the criteria for the problem solution.

/✓/ 3. The criteria for a problem solution are usually inherent in the problem solver's own frame of reference and in the goal that the individual is trying to attain. This goal and this frame of reference will tolerate only certain problem solutions, and the limits of this tolerance will establish the criteria for the problem solution.

Which of the above choices did you select? To be sure, there are times when the first two choices will be partially correct, but, in the majority of cases, choice three reflects the basis of most criteria.

The following statements are typical of criteria that come from an outside source as well as from the individual problem solver himself. Indicate by a check mark in the spaces provided those criteria that you believe arise from the problem solver's own frame of reference and from his goal.

/✓/ 1. I don't know how I will resolve this problem, but I do know that the solution cannot cost too much to implement because my budget is so strained.

/✓/ 2. Oh sure, that solution appears to be the best solution, but it goes against everything in which I believe.

/✓/ 3. If this problem is not resolved by 1600 hours, the old man will have my scalp.

/✓/ 4. I would like to do it that way. If it works, however, I might as well forget about going on leave this fall.

/✓/ 5. Not only do we have to find a solution, but we have to find a cheap solution because the commander says there are no more funds for this project.

/___/ 6. This is a very sophisticated solution, and that is precisely why it will not be acceptable to the commander. It is too sophisticated.

Criteria one, two, and four above are those criteria that are derived from the problem solver's own frame of reference and from his goal. The other criteria came from an outside source.

During the gathering data step of the problem solving sequence, there will be times when you accumulate some opinions. Opinions, irrespective of their source, are of only limited value in reaching a solution to a problem. This is true because solutions to problems must be based on data that is demonstrably true. Opinions, however well intended, do not meet this test. As you gather data to be used in support of a problem solution, you will be required to evaluate each item in order to determine if it is fact or opinion.

Here are some definitions of fact and opinion. Use these definitions as your basis for an evaluation of the statements that follow.

A fact is an observed event, past or present, that has been personally observed or has been observed and reported to you.

An opinion is a personal judgment that you have made or that some other individual has made.

Some of the statements below are facts, and some are opinions. After you read each statement, identify it as a fact or as an opinion by writing fact or opinion in the space provided next to each statement.

F 1. The Garret Fixit Shop charges $14.00 for overhauling the engine in one M4A power mower.

O 2. "I think $14.00 is too much to pay for any small engine overhaul," said Mr. Berg, an educational specialist.

O 3. "Maintenance costs can be reduced $2.50 for each overhaul by installing parts made in our factory," said Mr. Bear, a factory representative for M4A power mowers.

O 4. If automible accidents continue to increase, it is a certainty that automobile insurance rates will increase.

F 5. There are 114 extra power mower parts presently stored in the base warehouse.

O 6. I think power mower breakdowns could be greatly reduced if the abuse to the mowers could be eliminated.

F 7. Lt Jones has $500.00 to spend on a new boat.

O 8. If the present trend of tardiness continues, Capt Schnazz will be late for work again Friday.

The correct responses for the preceding statements are as follows:

1. Fact

2. Opinion

3. Opinion

4. Opinion

5. Fact

6. Opinion

7. Fact

8. Opinion

Statement number three is questionable. If Mr. Bear can produce enough evidence to prove his statement, it will be a fact. Otherwise, it must be considered an opinion. This statement, along with other statements, becomes useful evidence to support problem solutions only when it can be accepted as a fact.

This completes our examination of step two of the problem solving sequence. We will go now to the third step in the sequence, list possible solutions to the problem.

STEP THREE -- LIST POSSIBLE SOLUTIONS TO THE PROBLEM

By the time that you get to this third step in the problem solving sequence, you will have most of the data that the problem solution requires. As a part of this data, you will have defined many of the criteria that will set the limits for the selection of the final solution. You are now ready to give your imagination free rein and to list as many possible solutions to the problem as your facts and assumptions will support. Each of these possible solutions that you list must eventually be weighed against the criteria that you have established.

Let us assume that the criteria for the power mower situation are as listed below. Bear in mind that you are allowed to establish additional criteria later.

1. Spending on power mower maintenance for the remaining six months of this fiscal year must be reduced to a level that is 50 percent lower than the spending during the previous six months.
2. The grounds that are currently being maintained must continue to be maintained in much the same condition as they now are.
3. Money cannot be diverted from other areas to supplement the maintenance fund.
4. No new mowing equipment can be purchased.
5. The present equipment operators must remain on the payroll.

The following are possible solutions to the tentative statement of the problem, to find ways to reduce mower breakdowns. Indicate those solutions that are within the limits of the criteria just furnished by placing a check mark in the spaces provided.

/___/ 1. Reduce wear and tear on the mowers by limiting grass cutting activity to certain areas of the base.

/___/ 2. Replace all of the mowers that are experiencing major repairs with new equipment.

/___/ 3. Fire those operators who may be abusing the equipment, and replace them with newly hired operators.

/✓/ 4. Establish and operate an intensive course in mower maintenance for all operating personnel.

There are many other possible solutions, but these will serve our purposes for now. Did you select choice number four as being the only choice within the limits of the criteria?

Since all of the above solutions are products of a creative imagination, let's pause at this time to have a brief discussion of creative thinking.

Creative thinking can be defined as the imaginative recombination of known elements into something new and different. Since all ideas are syntheses of our experiences, we probably never have a truly original idea. We can, however, be creative by consciously changing and recombining old ideas or by improving or modifying established procedures.

Here are three sources from which you can draw a possible solution to a problem:

1. Your experience,
2. Your ability to think logically, and
3. Your ability to think creatively.

Here are the descriptions of the way in which three individuals derived a solution to a problem. Tell us, by writing logic, experience, or creativity in the blank provided, which individual used which approach to derive a possible solution to a problem.

1. CW-3 Ashley assembled a large number of facts about the problem. He then derived a possible solution based on a trend evident in those facts. logically
2. Capt Rose, while gathering facts for a problem solution, just happened to remember that this new problem was similar to one that he had been called upon to solve a year ago. experience
3. Maj Jones gathered a mass of data for the solution. He then recombined these elements of data in a most unusual way to derive a possible solution. creatively

While CW-3 Ashley was deriving a solution logically, and Capt Rose was basing a solution on his past experience, Maj Jones was deriving a solution creatively. It is obvious that Maj Jones knows about these barriers to creativity, and he knows how to overcome them.

Here are the principle barriers to creativity:

1. Habit - This is the reluctance to change from the old and accepted way of doing things.

2. Fear - This is the fear of adopting new ways and the fear of discarding the old ways. This barrier to creativity also includes the fear of authority and the fear of being thought a fool for recommending the new and novel.

3. Inertia - This is resistance to change. This barrier to creativity includes a reverence for the traditional ways of doing things. It is demonstrated by a lack of desire to expend the energy necessary to effect a change.

4. Prejudice - This is the enmity toward or the affection for something. An example of this prejudicial affection is the pride of authorship.

Which of the following problem solutions suffered from the habit barrier to creativity?

/___/ 1. We can improve the seating accommodations at this year's convention by renting bleacher seats from the local ball park.

/✓/ 2. If there is an overflow crowd at this year's convention, we shall deny them entry as we have always done.

The second choice represents the habit barrier to creativity at work.

Which of the following statements indicates that the fear barrier to creativity is at work?

/✓/ 1. You must think I am out of my mind. I would never propose such a solution to the old man.

/___/ 2. This solution is out of the question because it requires that I modify my goals.

The first choice represents the fear barrier to creativity at work.

Which of the following statements indicates that the inertia barrier to creativity is at work?

/___/ 1. CW4 White wants suggestions for new maintenance procedures, but he doesn't want anything that will cost a lot of money.

/✓/ 2. CW4 White wants suggestions for new maintenance procedures, but he doesn't want anything that will require an expenditure of a lot of time and effort.

The second choice is representative of the inertia barrier to creativity at work.

Which of the following statements indicates that the prejudice barrier to creativity is at work?

/✓/ 1. This is my solution to the problem, and, while it may not be the best in every respect, I will see to it that it is accepted.

/___/ 2. I agree that this is the best solution to the problem, but let's not make the chief unhappy with a change.

Number one is an example of the prejudice barrier to creativity at work.

There you have the major barriers to creativity at work: habit, fear, prejudice, and inertia. If these barriers can be overcome, your native powers of creativity can operate.

How can you overcome these barriers? The best way to begin is to develop a questioning attitude. To develop this questioning attitude, we may work individually, using some form of interrogation method, or we may work as a group, brainstorming a problem. We will take a closer look at both of these techniques for developing a questioning attitude. First, let's look at an interrogation method as it might be applied to the power mower problem.

Here are some questions that we might ask ourselves about the power mower problem. Check those questions that you believe will serve as a stimulus to creativity.

/___/ 1. How is it possible to maintain the mowers for the remainder of the fiscal year on the $266.00 remaining?

/___/ 2. Could I find the solution by looking at mower maintenance from some other individual's point of view?

/✓/ 3. Is it possible that the solution to the problem lies outside my own organization?

Questions two and three have the potential for stimulating creativity, while questions similar to number one can only lead to frustrations.

Let's examine these last two questions more fully in order to see what they might prompt in the way of possible solutions to the problem.

Could I find the solution by looking at mower maintenance from some other individual's point of view?

Is it possible that the solution to my problem lies outside my own organization?

Which of the following possible solutions could have been derived from this creative questioning? Check the responses of your choice.

/___/ 1. I see mower maintenance as a costly and complex operation. The commander sees it as a simple and inexpensive process. A possible solution, therefore, is to convince him of my point of view so that he will increase the fund authorization.

/✓/ 2. I see mower maintenance as an unexciting but necessary chore. I am sure all of the shop personnel feel the same way. If I can locate individuals who consider small motor repair as an enjoyable and healthy diversion, they might give us a hand in maintaining the mowers for a minimum of pay.

/✓/ 3. It is possible that there are civilian small motor repairmen in the local community who would welcome the opportunity to earn extra pay, and that pay might be significantly less than that paid to shop personnel.

/___/ 4. Since the maintenance of small engines is not too different from that of large engines, I will assign this mower maintenance task to the heavy equipment officer who is second to me in command.

Choices two and three are representative of the creative approach to problem solving. Choices one and four are extremely ill-advised in that they consider making your problem someone else's problem.

With that individualized way of stimulating a questioning attitude behind us, let's consider a group technique of accomplishing the same thing. This technique is called brainstorming.

Brainstorming is a group ideation technique that is designed to stimulate a chain reaction of ideas or possible solutions that relate to a stated problem. Since the basic purpose of brainstorming is to derive the maximum number of ideas and possible solutions, which of the following statements is the most valid description of a brainstorming session?

/✓/ 1. The members of the group advance as many ideas and suggest as many solutions as is possible in the time allowed without fear of criticism.

/___/ 2. The members of the group evaluate the ideas and possible solutions as they are advanced, and they evaluate their potential application to the problem.

The first choice is correct. The whole idea of brainstorming is quantity, not quality.

To get the best results from a brainstorming session, there are certain rules and procedures that should be followed. We shall discuss four of these rules.

The first and foremost rule of brainstorming is to withhold judgment. This simply means that no evaluation, criticism, or judgment of any kind should be made of an idea that is advanced by a member of the group until the brainstorming session is over.

Which of the following is most likely to happen if members of the group are permitted to evaluate and to criticize ideas during the brainstorming session?

/✓/ 1. Some members of the group are likely to let evaluation and criticism of their ideas interfere with their flow of ideas.

/___/ 2. Some members of the group are likely to become emotional to the point of their ideas becoming unrealistic.

The first choice above is correct. The flow of ideas from a group will almost invariably slow down or stop when a judgment of any kind is allowed during the session.

Which of the following statements indicates that the first rule of brainstorming is being broken?

/___/ 1. A brainstorming session is being conducted in Room 14 for the purpose of obtaining ideas that might contribute to the solution of a stated problem. Every idea that is advanced is recorded and kept until the session is over.

/✓/ 2. A group of men in Room 12 are participating in a brainstorming session for the purpose of deriving as many possible solutions as they can to a stated problem. When an obviously inferior suggestion is made, it is discarded immediately.

The men in Room 12 are breaking the first rule of brainstorming by passing judgment. You should have checked number two.

The second rule of brainstorming is to encourage freewheeling. Freewheeling simply means that, once the leader of the session has the flow of ideas started, the leader allows the group to continue under its own steam with little or no guidance.

The following are narratives that describe some of the activities taking place in each of two brainstorming sessions. Which group is making the best use of the second rule of brainstorming?

/___/ 1. WO1 Jones is a participant in a brainstorming session. Jones withholds his ideas because he believes they are invalid. At the very beginning of the session, CPT Barnes and LT Smith advanced some novel ideas, but they were criticized rather severely by other members of the group. As a result, Barnes, Smith, and Jones are now remaining silent.

/✓/ 2. A brainstorming session is being conducted in Room 202. WO1 Crane made a suggestion which sounded ridiculous, and this caused a hearty laugh that was enjoyed by all of the participants. In spite of this, however, the idea was jotted down by the recorder along with all of the other ideas that were coming in from the group.

Freewheeling is very much in evidence in description number two above. No matter how farfetched an idea is, you cannot be sure it is invalid until you have taken a long, hard look at it.

The third rule of brainstorming is one that we have already mentioned in passing. This rule is to aim for quantity, not quality. If enough ideas are presented during the session, some of them will contain the quality that is needed, but the selection of the quality ideas must wait until the session is over.

Which of the following groups is most likely to produce the best idea?

/___/ 1. Group A stayed in session for 25 minutes, but they worked fast and produced a list of 21 ideas.

/✓/ 2. Group B stayed in session for 45 minutes, and they produced a list of 46 ideas.

Group B is more likely to produce the best idea, because this group has the larger list of ideas from which to choose. This need for producing a large number of ideas brings us to the fourth rule of brainstorming.

The fourth rule of brainstorming is to hitchhike ideas. This is a way in which a hitchhike idea rides in on another idea. In a brainstorming session, one member of the group suggests an idea. This idea triggers a thought in the mind of another member of the group. This continues to happen until there is a whole series of ideas that were all prompted by an original idea.

Identify the statement below that does the best job of describing the rule of hitchhike ideas in action.

/✓/ 1. The combination and improvement of ideas previously advanced.

/✓/ 2. The creation of a chain reaction by which one idea suggests another.

/___/ 3. The attempt to get members of the group to be self-starters and to present ideas on their own initiative.

Numbers one and two above are both valid descriptions of hitchhike ideas, but number two, with the use of the term "chain reaction," does the best job of describing hitchhike ideas.

For a review of the four rules of brainstorming that we have just covered, determine which rule of brainstorming is depicted in each of the statements that follow. Write the rule in the space that follows each of the statements.

1. The group leader asks for at least 20 more ideas.

---

2. This suggestion reminds me of another idea that might help to solve the problem.

---

3. Don't ridicule the idea yet. It might turn out to be the best suggestion of all.

---

4. At first glance, some of the ideas the recorder jotted down in Room 91 sound crazy, ridiculous, absurd, and remote.

The rules of brainstorming depicted in the preceding statements are as follows:

Number one is aim for quantity, not quality.

Number two is hitchhike ideas.

Number three is withhold judgment.

Number four is encourage freewheeling.

In addition to the four rules of brainstorming that we have just covered, there are some techniques for conducting a brainstorming session that should be decided upon and implemented by the group leader. Since you may find yourself in the role of the group leader, we have decided to discuss five of these techniques here.

1. The group leader selects a number of individuals to participate. The ideal number is from 12 to 15 members.

Why is the ideal group size of a brainstorming session from 12 to 15 members? Select your response from the alternatives that follow.

/___/ a. Because the average size of most seminar groups in the Army is from 12 to 15 members.

/✓/ b. Because if the group is too small, fewer ideas are likely to be advanced. If the group is too large, some participants may not be able to present their ideas.

Response b. is the best reason for selecting from 12 to 15 members.

2. The group leader must limit the problem to an area that the group knows something about.

What is the primary reason for limiting the problem? Select your response from the alternatives below.

/___/ a. The group leader must prevent the group from presenting remote, farfetched, and absurd ideas.

/✓/ b. The group leader must assist the group in thinking in the same channels.

Response b. is correct.

3. The group leader must state the problem, and he must be sure that the problem is understood by each participant.

Which of the following participants do you think might not understand the problem to find ways to reduce mower maintenance costs?

/✓/ a. Capt Smith: "It's much more economical to repair tractors than automobiles."

/___/ b. WO1 Jones: "We can save money by buying mower parts at wholesale prices."

Captain Smith either does not understand the problem or he is thinking about another approach to economy.

4. The group leader must appoint one or two recorders, and he must instruct them to write down all of the ideas mentioned by the participants.

It has been shown that, for best results, all ideas and suggestions should be written on a blackboard. What is the most obvious result of this practice?

/✓/ a. It helps participants to remember what has been mentioned, and it stimulates hitchhike ideas.

/___/ b. It causes some participants to remain silent for fear of having their ideas exposed to ridicule.

You should have checked item a. above.

5. The group leader should avoid placing a time limit on the brainstorming session.

The absence of a time limit on the brainstorming session allows the group leader to do which of the following?

/✓/ a. Keep the group going for as long as he can stimulate them to produce ideas.

/___/ b. Keep the group going until the problem is completely solved.

If a time limit is placed on the session, the group might not produce all of the ideas of which they are capable. Item b. above is incorrect because brainstorming does not attempt to solve problems.

The self interrogation and brainstorming techniques that we have discussed do not guarantee creativity. They are, however, excellent tools that we can use to overcome the barriers to crativity.

This concludes our discussion of step three, list possible solutions to the problem. Early in this step, we generated several alternative solutions to the power mower problem. You may want to refer back to these possible solutions as we consider step four, test possible solutions to the problem.

STEP FOUR--TEST POSSIBLE SOLUTIONS TO THE PROBLEM

This is the time in the problem solving sequence in which you put all of the possible solutions to the test. The yardstick by which you measure these solutions is which of the following?

/___/ 1. The acceptability of each of these solutions to your superiors.

/X/ 2. The degree to which each of these solutions meets the criteria that you have established.

If you selected the first choice above, then you are only partially correct. While it is true that your superiors may establish some of the criteria for the problem solution, they will never provide it all. The total criteria will come from your own frame of reference, from your goal, from the nature of the obstacle, and from outside sources. The total criteria will invariably test these things about each of the possible solutions:

1. Can we implement this solution?
2. Can we afford this solution?
3. Will this solution work?

It is important to remember that each of the possible solutions must be tested against each of the criteria. Which of the following best describes this testing process?

/X/ 1. The testing of solutions begins with a very general evaluation of the solutions. In this evaluation, those solutions that are obviously unworthy are eliminated. The refined list is then subjected to a more detailed evaluation until one or more solutions remain, each of which meets all of the criteria. This list is then narrowed down to one best solution.

/___/ 2. The testing of possible solutions involves the use of the combined criteria as a yardstick against which all of the possible solutions are weighed. When this has been accomplished, your list of possible solutions will have been reduced to the one best solution by the elimination of all other solutions.

Choice one describes a testing process that proceeds from the general evaluation of the possible solutions to a very precise evaluation of the remaining solutions. This is the way in which the testing process proceeds, and, as choice one states, it may happen that your list will be narrowed down to more than one final solution, each of which meets all of the criteria that you have established. What do you do then? Select one of the responses that follow.

/___/ 1. If we have more than one final solution, and each of these solutions meets all of the criteria, we decide on a final solution by asking our superiors which they prefer.

/ 2. If we have more than one final solution, and each of these solutions meets all of the criteria, we decide on a final solution by deriving additional criteria against which to weigh these solutions.

The last choice is correct. Criteria are the only means by which we evaluate possible solutions to the problem.

If you recall, our tentative statement of the problem was to find ways to reduce mower breakdowns. We saw that the statement was far too broad to be dealt with effectively. It is also possible that the problem has not been correctly identified. With that in mind, let us bring you up-to-date on all the data relevant to the problem. As a part of this data, there is a single statement that requires that we reevaluate the statement of the problem above for accuracy. See if you can identify that single statement in the list that follows. If you do identify it, draw a circle around it.

1. The post owns and operates 20 M4A rotary power mowers.
2. The total cost of mower maintenance for fiscal year 1966 was $855.00.
3. The cost of mower maintenance for the first half of fiscal year 1967 was $589.00.
4. The present status of the mowers is as follows:
   a. Two mowers are inoperative and will require complete overhaul.
   b. Six mowers are in operation, but they require overhaul.
   c. Twelve mowers are in operation that require no servicing.
5. There is a two month's supply of minor parts on hand.
6. The estimated cost of mower maintenance for 1967 based on the first six month's operating cost is $1200.00.
7. Grass cutting can be accomplished with 18 operating mowers if these mowers do not break down.
8. Mowers are presently being abused by the operators, and this is the primary cause of major breakdowns.
9. Mower operators on the payroll must remain on the payroll through fiscal year 1967.
10. There is no positive way to control the abuse the mowers are receiving
11. The total cost of mower maintenance for fiscal year 1967 cannot exceed the total cost for 1966.
12. The funds remaining for fiscal year 1967 are $266.00.
13. Grass must be cut according to the present schedule with a slight variation allowed according to needs.
14. All mowers with the exception of the two that are out of service must remain in operating condition throughout the remainder of the year.
15. No new mowers can be purchased.
16. No money can be diverted to supplement the maintenance fund.

The statement above that requires that we take another look at the tentative statement of the problem is number ten. Di you spot it? With this bit of information, it is illogical to assume that we can find ways to reduce mower breakdowns.

By referring to the complete data just presented, we should be able to finalize the statement of the problem. We know that the tentative statement is too broad, and we now know that it is unrealistic to look for ways to reduce mower breakdowns. With that in mind, which of the following is the most effective new statement of the problem?

/___/ 1. To find ways to reduce the cost of mower maintenance for the remainder of Fiscal Year 1967.

/___/ 2. To find ways to maintain 18 power mowers in a serviceable condition for the remainder of Fiscal Year 1967 at a cost not to exceed $266.00.

The second choice is the more effective new statement of the problem for three reasons:

1. It is precise in stating what must be accomplished.
2. It specifies a time period, and
3. It limits the scope of the problem.

Here are a few solutions that we have suggested or hinted at in this text. Since we begin our test of possible solutions with the elimination of those solutions that are obviously unworthy of consideration, we want you to take care of this elimination process now. Draw a line through all of the following solutions that are not worthy of consideration.

1. Have your most capable maintenance men modify the mowers in such a way that they will not break down.
2. Convince the commander that power mower maintenance is a complicated and expensive task so that he will allocate more funds.
3. Contract to have the mowers maintained by a commercial firm for the amount of money remaining.
4. Contract to have the mowers maintained by a single individual for the amount of money remaining.
5. Utilize off duty personnel who are qualified in small motor repair to maintain the mowers for a minimum per hour wage rate.
6. Seek assistance from some other activity on post having vehicle mechanics assigned.

Of all the above possible solutions, only numbers three, four, and five bear investigating further. You should have lined through solutions numbered one, two, and six.

Let us suppose now that you investigated solutions three, four, and five and you have determined the following facts:

For solution number three, to have the mowers maintained by a commercial concern, the lowest bid was for $490.00.

For solution number four, to have the mowers maintained by a single individual, the lowest bid was for $265.00.

For solution number five, to use qualified off-duty personnel, there are 23 men available who will work for $1.50 per hour.

It is obvious from your investigation that one of the solutions is out of the question. That solution is which of the following?

☑ 1. To contract with a commercial concern.

☐ 2. To contract with an individual.

☐ 3. To utilize off-duty personnel.

The cost criterion definitely eliminates the first choice as a possible solution to the problem. This leaves us with two alternative solutions to the problem, and each of these solutions meets all of the criteria. This, then, brings us to the fifth step of the problem solving sequence, to select the best solution to the problem.

STEP FIVE--SELECT THE BEST SOLUTION TO THE PROBLEM

This is a step in the problem solving sequence that may or may not exist. If, in the previous step, the solutions were tested and narrowed down to just one remaining solution, then that solution would be the best solution to the problem. If, however, there is more than one solution, and each of these solutions meets all of the criteria, then you must select the best solution from those remaining. We have already seen that this can only be done by establishing some additional criteria gainst which to measure each of the remaining solutions.

We now have two solutions meeting all of the criteria, and we must choose between them.

> Contract to have the mowers maintained by an individual for the amount of money remaining.
>
> Utilize off-duty personnel who are qualified in small motor repair to maintain the mowers for a minimum per hour wage rate.

We must now establish some additional criteria against which to measure each of the above solutions. The following are additional criteria that you might consider. Check those that you consider to be the most appropriate.

/X/ 1. The solution selected must not interfere with the mission of any other organization.

/ / 2. The solution should, if at all possible, contribute to the morale and welfare of all base personnel.

/ / 3. The solution should utilize military personnel in its execution.

/X/ 4. The solution should be flexible enough to allow for alterations to insure that you remain within the limits of the available funds.

Now, you think of a few additional criteria, and list them here.

/X/ 5. _____

_____

_____

/X/ 6. _____

_____

_____

With the crigeria just chosen, can you make a choice between the two remaining solutions? When you can, you have completed the problem aolving process with the exception of one remaining step. Your task is not complete until you have implemented the problem solution.

STEP SIX--IMPLEMENT THE PROBLEM SOLUTION

For this step in the problem solving sequence, let us review the evolution of a problem such as one you may be handed at any time. For this review, let us assume that you are on the commander's staff, and you are sitting in on one of the weekly staff meetings. During the course of the meeting, the commander tosses you a problem. While you may not immediately recognize it as a problem it is one, and it is yours from this point on. How would the commander probably state the problem? Check the response of your choice.

/___/ 1. Fred, my people tell me that the traffic is jamming up around the main gate at quitting time. Would you see what could be done about this?

/___/ 2. Fred, would you survey the traffic situation on post and see if there are any rough spots?

It is more likely that the commander will spell the problem out to some degree as in choice one above.

Let us now suppose that you have gone through the entire problem solving process, and you have selected the one best solution to the traffic jam at the main gate. Which of the following would be the more accurate description of the commander's interest at this point?

/___/ 1. The commander would not be interested in what you identified the problem to be, nor would he be interested in how you went about solving it. He expects you to solve the problem and then to implement the proper solution.

/✓/ 2. The commander expects to be kept informed as to what you identified the problem to be, what factors affected your choice of the final solution, what solutions you considered, and how you plan to implement the final solution.

The last choice is correct. This last choice describes what is known as completed staff work. Completed staff work gives the commander the chance to do these two things:

1. He can evaluate all of the factors that affected your choice of a final solution, and
2. He can serve as the final approving authority for the implementation of that solution.

If it were otherwise, the commander would be in a position of not being kept informed about matters that could conceivably affect all of the members of his command.

There is a conclusion to be reached from this brief look at the evolution of a problem. Which of the following is the most valid description of this conclusion?

/X/ 1. Most problems that you will be called upon to solve in an operational or administrative capacity as a junior officer will be handed to you by a superior. It will then be up to you to select the best solution to the problem, to prepare the necessary implementation procedures, and to secure the superior's approval of both the solution and the implementation procedures.

/___/ 2. Most problems that you will be called upon to solve in an operational or administrative capacity as a junior officer will be problems that you identify for yourself. Once this has been done, it will be up to you to select the best solution, to prepare the necessary implementation procedures, and to see to it that these procedures are carried out.

Choice number one describes completed staff work. For this reason, it is the correct choice.

At this point, we will return to the power mower problem for the last time to see how our final solution might be implemented.

Let us suppose, for the sake of this exercise, that the solution you selected was this:

> Contract to have the mowers maintained by an individual for the amount of money remaining.

With our previous discussion of completed staff work to assist you, which of the following is more representative of the action required to implement the solution above?

/___/ 1. Notify the commander that you have found a way to effect the required savings. With this done, contact the individual you have identified as being able to perform the required services at the price agreed upon. Arrange to have the mowers delivered to him at a time and a place that is acceptable.

/X/ 2. Submit a detailed report to the commander outlining the steps you went through in reaching the solution. To this report, attach the necessary documents to implement the solution. Include, also, provision for the commander to approve or to disapprove the solution and the implementation instructions.

The second choice, while not attempting to precisely define the form of completed staff work, is more representative of the type of action required.

Let us assume now that you decided on this solution instead of the previous one:

> Utilize off-duty personnel who are qualified in small motor repair to maintain the mowers for a minimum per hour wage rate.

What are some of the documents and supporting material that might be required when you submit this solution in the form of completed staff work? List as many as you can think of.

1. _____

_____

2. _____

_____

3. _____

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4. _____

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5. _____

_____

Your list should have included such possibilities as the following:

1. Notification in the form of letters to commanders or a notice to be placed in the daily bulletin to the effect that men are needed for this maintenance task.

2. Approval in the form of a letter to be signed by the post commander to the effect that off-duty men can participate in this activity.

3. The necessary documentation required to authorize a building to be set aside and equipped for this activity.

4. A notice to the fire marshal of the potentially hazardous activity to take place in the shop that is to be established.

5. A notice to the comptroller authorizing him to pay the wages from appropriated funds as required.

6. A letter of authorization for the use of Army tools and equipment in this activity.

While you may not have listed the same items, we hope that you considered the complex requirements of completed staff work.

We have now reached the end of the problem solving portion of this text. The next part of the text concerns the use of the staff study report as the accepted format for reporting and securing the approval of completed staff work.