Solving a Problem

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How can you develop strong skills for solving a problem?

You probably use these basic steps, each of which will be described in more detail on the following screens:

Step 1: Define the problem.

Step 2: Gather information about the problem.

Step 3: Brainstorm possible solutions, then evaluate each possibility.

Step 4: Select a course of action based on your information and evaluations.

Step 5: Check to see how well the course of action is working.

Step 6: Redefine the problem or identify additional problems, and start the process over.

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Step 1: Define the problem.

Problems are easier to solve when they are clearly defined. For example, study the following problem statements and their analyses.

Statement of a Problem	Analysis of the Statement
People don't care about the environment.	The problem is vague and hard to address.
Elementary students receive less outdoor education than they used to.	The problem is clear. It targets a specific group of people and specific concern.

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Directions: List a well-defined statement that each vague statement might include. The first one is done as a sample.

Vague Statement	Well-Defined Statement
Our school wastes resources.	Teachers use too much paper on handouts.
The air is dirty.	
People don't see their impact on the environment.	

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Your responses may look like this.

Vague Statement	Well-Defined Statement
Our school wastes resources.	Teachers use too much paper on handouts.
The air is dirty.	Garbage trucks make too many trips through the city.
People don't see their impact on the environment.	People let rainwater run into the sewers instead of saving it to water their plants.

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Step 2: Gather information about the problem.

Some of the information that you need to gather includes:

- **Background:** How did this problem develop? How have people tried to solve it?
- **Data:** Can you find statistics that measure the size of the problem? Can you determine the monetary cost of the solution?
- **Interests:** Who will benefit if you can solve the problem? Who benefits from letting the problem continue? Who will pay the cost of the solution?

Directions: Imagine that you want your school cafeteria to switch to a more environmentally friendly dish detergent. In the chart on the following screens, identify the type of information that you could gather in each category.

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Category	Information
Background: How did this problem develop? How have people tried to solve it?	
Data: Can you find statistics that measure the size of the problem? Can you determine the monetary cost of the solution?	

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Category	Information
Interests: Who will benefit if you can solve the problem? Who benefits from letting the problem continue? Who will pay the cost of the solution?	

Sample responses are shown on the following screens.

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Category	Information
Background: How did this problem develop? How have people tried to solve it?	Talk to people who work in the cafeteria about how they decide which detergent to buy and whether they consider environmental issues.
Data: Can you find statistics that measure the size of the problem? Can you determine the cost, in money, of the solution?	Find out how much money the school spends on dish detergent and how much different brands cost.

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Category	Information
Interests: Who will benefit if you can solve the problem? Who benefits from letting the problem continue? Who will pay the cost of the solution?	Businesses that sell the new detergent could benefit. Businesses that sell the existing product could suffer. If the new detergent costs more, the school may need to spend less money on something else.

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Step 3: Brainstorm possible solutions, then evaluate each possibility.

Identify various possible responses. Consider the strengths and weaknesses of each one.

For example, if you wanted to reduce littering in your community, you might organize a social media campaign urging people not to litter. What are the strengths and weaknesses of this approach?

- **Strengths:** It could spread the message quickly and it would not cost any money.
- **Weaknesses:** It might not reach people who are littering and it does not give a strong incentive to anyone to stop littering.

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Directions: Identify strengths and weaknesses of each option for reducing littering.

Option	Strengths	Weaknesses
Increase the fine for littering		
Put up anti-littering signs		
Place more trash cans in parks		

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Your responses may look like this.

Option	Strengths	Weaknesses
Increase the fine for littering	Would increase the incentive not to litter	Requires a law to be passed by the city
Put up anti-littering signs	Would be easy to accomplish	Requires money for signs
Place more trash cans in parks	Would make throwing away trash easier	Requires money for garbage cans

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Step 4: Select a course of action based on your information and evaluations.

Compare the strengths and weaknesses of each option with your resources. Are you part of a large group of people who are willing to volunteer their time? Can you raise money? Do you have political power? Then, select the course of action that makes most sense.

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Step 5: Check to see how well the course of action is working.

Three ways to monitor progress are described below.

Method	Example
Count	To see if reducing bus fares is causing more people to ride buses, a city planner might study the total sale of bus tickets.
Sample	To see if a new law to reduce water pollution is effective, a biologist might test water samples from a lake.
Survey	To see if ads urging people to visit state parks are changing views about the environment, a sociologist might conduct a survey.

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Directions: Explain how you would monitor your progress toward each of these goals.

Goal	Monitor	Type of Measure
Reduce the use of paper in your school		
Reduce littering		
Increase public support for recycling		

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Your responses might look like this.

Goal	Monitor	Type of Measure
Reduce the use of paper in your school	Ask the school for data on paper purchases	Count
Reduce littering	Count the amount of litter found in a block	Sample
Increase public support for recycling	Ask people their opinions	Survey

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Step 6: Redefine the problem or identify additional problems, and start the process over.

As you work on a problem and you learn new information about it, you might be able to define it more precisely or to identify related problems. Then, repeat the first five steps as needed.

Consider this example:

- **Initial Goal:** Reduce the amount of trash going to the landfill.
- **New Information:** Much of the trash consists of old sofas and chairs.
- **Redefined Goal:** Focus on ways to reuse or recycle furniture.