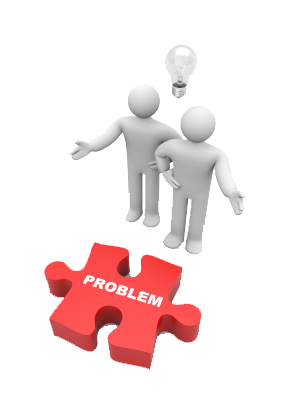
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# Preface

*Learning is a treasure that will follow its owner everywhere.*

*Chinese Proverb*

## What is Courseware?

MC900071138[1]Welcome to Corporate Training Materials, a completely new training experience!

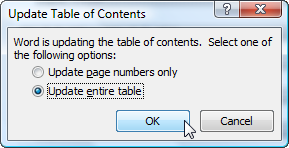
Our courseware packages offer you top-quality training materials that are customizable, user-friendly, educational, and fun. We provide your materials, materials for the student, PowerPoint slides, and a take-home reference sheet for the student. You simply need to prepare and train!

Best of all, our courseware packages are created in Microsoft Office and can be opened using any version of Word and PowerPoint. (Most other word processing and presentation programs support these formats, too.) This means that you can customize the content, add your logo, change the color scheme, and easily print and e-mail training materials.

## How Do I Customize My Course?

Customizing your course is easy. To edit text, just click and type as you would with any document. This is particularly convenient if you want to add customized statistics for your region, special examples for your participants’ industry, or additional information. You can, of course, also use all of your word processor’s other features, including text formatting and editing tools (such as cutting and pasting).

To remove modules, simply select the text and press Delete on your keyboard. Then, navigate to the Table of Contents, right-click, and click Update Field. You may see a dialog box; if so, click “Update entire table” and press OK.

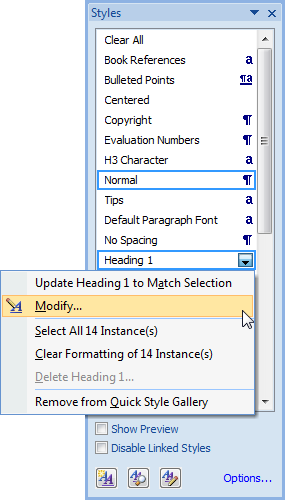


(You will also want to perform this step if you add modules or move them around.)

If you want to change the way text looks, you can format any piece of text any way you want. However, to make it easy, we have used styles so that you can update all the text at once.

If you are using Word 97 to 2003, start by clicking the Format menu followed by Styles and Formatting. In Word 2007 and 2010 under the Home tab, right-click on your chosen style and click Modify. That will then produce the Modify Style options window where you can set your preferred style options.

For example, if we wanted to change our Heading 1 style, used for Module Titles, this is what we would do:



Now, we can change our formatting and it will apply to all the headings in the document.

For more information on making Word work for you, please refer to Word 2007 or 2010 Essentials by Corporate Training Materials.

## Materials Required

All of our courses use flip chart paper and markers extensively. (If you prefer, you can use a whiteboard or chalkboard instead.)

We recommend that each participant have a copy of the Training Manual, and that you review each module before training to ensure you have any special materials required. Worksheets and handouts are included within a separate activities folder and can be reproduced and used where indicated. If you would like to save paper, these worksheets are easily transferrable to a flip chart paper format, instead of having individual worksheets.

We recommend these additional materials for all workshops:

* Laptop with projector, for PowerPoint slides
* Quick Reference Sheets for students to take home
* Timer or watch (separate from your laptop)
* Masking tape
* Blank paper

## Maximizing Your Training Power

We have just one more thing for you before you get started. Our company is built for trainers, by trainers, so we thought we would share some of our tips with you, to help you create an engaging, unforgettable experience for your participants.

* **Make it customized.** By tailoring each course to your participants, you will find that your results will increase a thousand-fold.
  + Use examples, case studies, and stories that are relevant to the group.
  + Identify whether your participants are strangers or whether they work together. Tailor your approach appropriately.

Different people learn in different ways, so use different types of activities to balance it all out. (For example, some people learn by reading, while others learn by talking about it, while still others need a hands-on approach. For more information, we suggest Experiential Learning by David Kolb.)

Make it fun and interactive. Most people do not enjoy sitting and listening to someone else talk for hours at a time. Make use of the tips in this book and your own experience to keep your participants engaged. Mix up the activities to include individual work, small group work, large group discussions, and mini-lectures.

Make it relevant. Participants are much more receptive to learning if they understand why they are learning it and how they can apply it in their daily lives. Most importantly, they want to know how it will benefit them and make their lives easier. Take every opportunity to tie what you are teaching back to real life.

Keep an open mind. Many trainers find that they learn something each time they teach a workshop. If you go into a training session with that attitude, you will find that there can be an amazing two-way flow of information between the trainer and trainees. Enjoy it, learn from it, and make the most of it in your workshops.

And now, time for the training!

# Module One: Getting Started

Welcome to the Creative Problem Solving workshop. In the past few decades, psychologists and business people alike have discovered that successful problem solvers tend to use the same type of process to identify and implement the solutions to their problems. This process works for any kind of problem, large or small.

*No problem can withstand the assault   
of sustained thinking.*

*Voltaire*

This workshop will give participants an overview of the entire creative problem solving process, as well as key problem solving tools that they can use every day.

## Housekeeping Items

Take a few moments to cover basic housekeeping items.

* If you need an opening or a way to introduce the participants to each other, utilize the Icebreakers folder to begin or between breaks during the day.
* Let participants know where they can find washrooms, break facilities, and fire exits.
* Ask participants to turn off their cell phones or at least turn them to vibrate. If they must take a call, request that they do it outside.
* Take this time to encourage the group to ask questions and make this an interactive workshop.
* Write the words Respect, Confidentiality, and Practice on a piece of flip chart paper and tape it to the wall. Explain to participants that in order to get the most out of this workshop, we must all work together, listen to each other, explore new ideas, and make mistakes. After all, that’s how we learn!

## 

## The Parking Lot

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\MP321RS9\MC900057299[1].wmfExplain the concept of The Parking Lot to participants.

* The Parking Lot is a visible place where you will “park” ideas that arise which are not on the agenda, may be off topic, or are better addressed outside of the program.
* At the end of the session, we will review parked ideas and follow up, or make suggestions for your own investigation when you are back at work.

Suggestions for the trainer:

1. If you are working with a large group of participants, you may wish to nominate a recorder to park items as you are facilitating.
2. It’s a good idea to note the name of the contributor along with the parked item.
3. Items noted on the parking lot can be useful to you later as you plan future training sessions.

## Workshop Objectives

C:\Users\Kimmi\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\JVU559D0\MCj02934740000[1].wmfResearch has consistently demonstrated that when clear goals are associated with learning that the learning occurs more easily and rapidly. With that in mind, let’s review our goals for today.

By the end of this workshop, participants will be able to:

* Understand problems and the creative problem solving process
* Identify types of information to gather and key questions to ask in problem solving
* Identify the importance of defining a problem correctly
* Identify and use four different problem definition tools
* Write concrete problem statements
* Use basic brainstorming tools to generate ideas for solutions
* Use idea generating tools, such as affinity diagrams, word chaining, the box method, the six thinking hats, and the blink method
* Evaluate potential solutions against criteria, including cost/benefit analysis and group voting
* Perform a final analysis to select a solution
* Understand the roles that fact and intuition play in selecting a solution
* Understand the need to refine the shortlist and re-refine it
* Understand how to identify the tasks and resources necessary to implement solutions
* Evaluate and adapt solutions to reality
* Follow up with solution implementation to celebrate successes and identify improvements

## Action Plans and Evaluations

Pass out the participant action plans and evaluations, available in the activities folder. Ask participants to fill these out throughout the day as they learn new things and have ideas on how to incorporate the things we discuss into their lives.

# Module Two: The Problem Solving Method

*Every problem has in it the seeds of its own solution. If you don’t have any problems, you don’t get any seeds.*

*Norman Vincent Peale*

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\3YJGCFYP\MC900198613[1].wmfTo begin, let’s look at the creative problem solving process. In this module, we will define “problem” and other situations that lend themselves to the creative problem solving process. We will introduce the concept of solving problems using a creative process. The approach we use in this course includes six steps, which are also introduced in this module.

## What is a Problem?

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9PDUOZYV\MC900441523[1].wmfThe Random House Unabridged Dictionary includes several definitions for the word “problem.” The definitions that we are most concerned with while learning about the creative problem solving process are:

* “any question or matter involving doubt, uncertainty, or difficulty,” and
* “a question proposed for solution or discussion.”

A problem can be defined as a scenario in which the current situation does not match the desired situation, or anytime actual performance does not match expectations. Other labels for a problem include challenges or opportunities, or any situation or circumstance for which there is room for improvement.

|  |  |
| --- | --- |
| Estimated Time | 10 minutes |
| Topic Objective | To understand what constitutes a problem and other situations that lend themselves to the creative problem solving process |
| Topic Summary | A problem occurs anytime that reality does not meet expectations. Problems can have other labels such as challenges or opportunities. |
| Recommended Activity | Have group members share problems they want to solve from their organizations or home lives. |
| Delivery Tips | This activity can be performed in large or small groups. |

## What is Creative Problem Solving?

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\39XQYYJK\MC900367542[1].wmfCreative problem solving has evolved since its inception in the 1950s. However, it is always a structured approach to finding and implementing solutions.

The creative problem solving process involves creativity. The problem solvers come up with solutions that are innovative, rather than obtaining help to learn the answers or implementing standard procedures.

The creative problem solving process is at work anytime you identify solutions that have value or that somehow improve a situation for someone.

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| Estimated Time | 10 minutes |
| Topic Objective | To define creative problem solving |
| Topic Summary | Creative problem solving is a structured approach to finding and implementing new solutions to areas where there is need for improvement. |
| Materials Required | * Flip chart paper * Markers |
| Materials Required | List of problems |
| Planning Checklist | Before the workshop, write the following list on the flip chart.   * Improving market share of a product * Learning to play an instrument * Diagnosing an illness with a number of subtle usual symptoms * Handling high employee turnover * Figuring the cost per unit for a bulk purchase |
| Recommended Activity | Review the list with the class and determine which items are appropriate for the creative problem solving process. Here are our answers.   * Improving market share of a product – YES * Learning to play an instrument – NO * Diagnosing an illness with a number of subtle usual symptoms – YES * Handling high employee turnover – YES * Figuring the cost per unit for a bulk purchase – NO |
| Review Questions | What is the difference between creative problem solving and implementing well-known solutions? |

## What are the Steps in the Creative Solving Process?

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FZCJR17Y\MC900014214[1].wmfThe Creative Problem Solving Process uses six major steps to implement solutions to almost any kind of problem. The steps are:

1. Information Gathering, or understanding more about the problem before proceeding
2. Problem Definition, or making sure you understand the correct problem before proceeding
3. Generating Possible Solutions using various tools
4. Analyzing Possible Solutions, or determining the effectiveness of possible solutions before proceeding
5. Selecting the Best Solution(s)
6. Planning the Next Course of Action (Next Steps), or implementing the solution(s)

|  |  |
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| Estimated Time | 10 minutes |
| Topic Objective | To introduce the six-step creative problem solving process |
| Topic Summary | There are six steps in the creative problem solving process. |
| Materials Required | * Flip chart paper * Markers |
| Planning Checklist | Before the workshop, write the following list on the flip chart.   * Information Gathering * Problem Definition * Generating Possible Solutions * Analyzing the Solutions * Selecting the Best Solution(s) * Planning the Next Course of Action (Next Steps) |
| Recommended Activity | With the prepared flip chart list hidden, ask the group to generate a list of steps to take when solving a problem. Write the list of ideas on a piece of flip chart paper.  Next, show the prepared list of the creative problem solving steps. Match the group’s list with the actual list of steps. For example, if brainstorming solutions is on the group’s list, match it to Generating Possible Solutions. |
| Delivery Tips | This activity can be performed in large or small groups. |
| Review Questions | What are the six steps in the creative problem solving process? |

# Module Three: Information Gathering

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\EOAYJ771\MC900370206[1].wmfThe first step in the creative problem solving process is to gather information about the problem. In order to effectively solve the correct problem, you need to know as much about it as possible. In this module, we will explore different types of information, key questions, and different methods used to gather information.

For having lived long, I have experienced many instances of being obliged, by better information or fuller consideration, to change opinions, even on important subjects, which I once thought right but found to be otherwise.

*Benjamin Franklin*

## C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9PDUOZYV\MC900300834[1].wmfUnderstanding Types of Information

There are many different types of information. The following list includes information you will need to consider when beginning the creative problem solving process:

* Fact
* Opinion
* Opinionated Fact
* Concept
* Assumption
* Procedure
* Process
* Principle

Facts are small pieces of well-known data. Facts are based on objective details and experience. Opinions are also based on observation and experience, but they are subjective and can be self-serving. When a fact and opinion are presented together, it is an opinionated fact, which may try to indicate the significance of a fact, suggest generalization, or attach value to it. Opinionated facts are often meant to sway the listener to a particular point of view using the factual data.

Concepts are general ideas or categories of items or ideas that share common features. Concepts are important pieces of information to help make connections or to develop theories or hypotheses. Assumptions are a type of concept or hypothesis in which something is taken for granted.

Procedures are a type of information that tells how to do something with specific steps. Processes are slightly different, describing continuous actions or operations to explain how something works or operates. Principles are accepted rules or fundamental laws or doctrines, often describing actions or conduct.

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| Estimated Time | 15 minutes |
| Topic Objective | To understand different types of information |
| Topic Summary | There are several different types of information to consider in the creative problem solving process. |
| Materials Required | List of information examples |
| Planning Checklist | Before the workshop, write the following list on the flip chart.   * The computer system is too hard to learn. * Only 45 fish died. * The restaurant garden space is 1/5 of an acre. * The substance is red. * A new computer system is too expensive to implement. * To wash your hands, first wet your hands, then add soap, rub your hands to lather the soap, and rinse off the soap. * The water cycle includes the evaporation of water, the condensation of water vapor into clouds, rain, and water flowing in streams and rivers back to lakes and seas. * Gravity causes dropped objects to always fall to the ground. |
| Recommended Activity | Review the list with the class and determine the type of information for each item. Here are our answers.   * The computer system is too hard to learn. OPINION * Only 45 fish died. OPINIONATED FACT * The restaurant garden space is 1/5 of an acre. FACT * The substance is red. RED IS A CONCEPT. * A new computer system is too expensive to implement. ASSUMPTION * To wash your hands, first wet your hands, then add soap, rub your hands to lather the soap, and rinse off the soap. PROCEDURE * The water cycle includes the evaporation of water, the condensation of water vapor into clouds, rain, and water flowing in streams and rivers back to lakes and seas. PROCESS * Gravity causes dropped objects to always fall to the ground. PRINCIPLE   If time permits, ask the participants to think of other examples of the different types of information and discuss. |
| Delivery Tips | This activity can be performed in small or large groups. |
| Review Questions | What are some of the different types of information? |

## Identifying Key Questions

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\OVV8IZ9R\MC900383528[1].wmfWhen tackling a new problem, it is important to talk to anyone who might be familiar with the problem. You can gather a great deal of information by asking questions of different people who might be affected by or know about the problem. Remember to ask people with years of experience in the organization, and lower-level employees. Sometimes their insights can provide valuable information about a problem.

What questions should you ask? The key questions will be different for every situation. Questions that begin with the following are always a good starting point:

|  |  |
| --- | --- |
| * Who? | * When? |
| * What? | * Why? |
| * Which? | * How? |
| * Where? |  |

Here are some examples of more specific questions:

* Who initially defined the problem?
* What is the desired state?
* What extent is the roof being damaged?
* Where is the water coming from?
* When did the employee finish his training?
* How can we increase our market share?
* Which equipment is working?

One important source of information on a problem is to ask if it has been solved before. Find out if anyone in your company or network has had the same problem. This can generate great information about the problem and potential solutions.

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| Estimated Time | 10 minutes |
| Topic Objective | To identify questions used to help gather information about a problem |
| Topic Summary | Asking questions of many different people helps to gather information about a problem. The key questions will be different for every situation. Start with who, what, which, where, when, why, and how to formulate questions. |
| Recommended Activity | Imagine that you are the regional manager for a high-end resort hotel in a major metropolitan area. Year-to-year occupancy rates are down and trending worse for the last six months. Who do you ask for more information about this problem? What questions would you ask?  Examples might include the hotel manager, preferred customers, and even the cleaning staff. Questions they might ask include:   * What is the necessary occupancy rate? * Who are the customers? Do they feel safe? Do they have a good time? * Are there any unusual activities happening at the hotel? |
| Delivery Tips | This activity can be performed in small or large groups. |
| Review Questions | What are key questions to ask in gathering information about a problem? |

## Methods of Gathering Information

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\ZKNEI80I\MC900149854[1].wmfWhen gathering information about a problem, there are several different methods you can use. No one method is better than another. The method depends on the problem and other circumstances. Here are some of the ways you can collect information about a problem:

* Conduct interviews.
* Identify and study statistics.
* Send questionnaires out to employees, customers, or other people concerned with the problem.
* Conduct technical experiments.
* Observe the procedures or processes in question first hand.
* Create focus groups to discuss the problem.

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| Estimated Time | 5 minutes |
| Topic Objective | To understand different methods of gathering information |
| Topic Summary | There are different ways to gather information for use in the problem solving process. |
| Recommended Activity | Have participants review the methods of gathering information listed in the Training Manual. Then, ask participants to choose two methods they would like to try for a problem they face and list them in their action plan.  If participants think of methods that are not listed, encourage them to share the method with the class. |
| Review Questions | What are the different methods of gathering information? |

# Module Four: Problem Definition

*No problem can be solved until it is reduced to some simple form.   
The changing of a vague difficulty into a specific, concrete form is a very essential element in thinking.*

*J. P. Morgan*

The next step in the creative problem solving process is to identify the problem. This module will explore why problem solvers need to clearly define the problem. It also introduces several tools to use when defining a problem and writing a problem statement.

## Defining the Problem

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\OVV8IZ9R\MC900200271[1].wmfDefining the problem is the first step in the creative problem solving process. When a problem comes to light, it may not be clear exactly what the problem is. You must understand the problem before you spend time or money implementing a solution.

It is important to take care in defining the problem. The way that you define your problem influences the solution or solutions that are available. Problems often can be defined in many different ways. You must address the true problem when continuing the creative problem solving process in order to achieve a successful solution. You may come up with a terrific solution, but if it is a solution to the wrong problem, it will not be a success.

In some cases, taking action to address a problem before adequately identifying the problem is worse than doing nothing. It can be a difficult task to sort out the symptoms of the problem from the problem itself. However, it is important to identify the underlying problem in order to generate the right solutions. Problem solvers can go down the wrong path with possible solutions if they do not understand the true problem. These possible solutions often only treat the symptoms of the problem, and not the real problem itself.

Four tools to use in defining the problem are:

* Determining where the problem originated
* Defining the present state and the desired state
* Stating and restating the problem
* Analyzing the problem

You may not use all of these tools to help define a problem. Different tools lend themselves to some kinds of problems better than other kinds.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand the first step in the creative problem solving process: defining the problem |
| Topic Summary | Defining the problem properly is important to avoid time consuming or costly steps that will not ultimately provide a good solution to the real problem. The tools of problem definition are introduced. |
| Stories to Share | A classic story of the issue of problem definition is the case of a high-rise hotel where guests begin complaining that the elevators are too slow. The building manager instructs the engineers to find a way to speed up the elevators. After further review, he refines the problem to address how to install additional elevators. However, he ultimately refines the problem once again. The solution to the real problem is to install mirrors in front of the elevators to distract guests from the wait time. When the problem is defined as the number of complaints being made, the solution turned out to be fairly simple and inexpensive compared to other solutions the building manager considers. After implementing this solution, the hotel complaints stop completely. |
| Recommended Activity | Have group members share any examples of solving the wrong problem or symptoms instead of the root problem. |
| Review Questions | Why is it important to define the problem before beginning to look for solutions to the problem? |

## Determining Where the Problem Originated

Successful problem solvers get to the root of the problem by interviewing or questioning anyone who might know something useful about the problem. Ask questions about the problem, including questions that:

* Clarify the situation
* Challenge assumptions about the problem
* Determine possible reasons and evidence
* Explore different perspectives concerning the problem
* Ask more about the original question

If you did not define the problem, find out who did. Think about that person’s motivations. Challenge their assumptions to dig deeper into the problem.

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| Estimated Time | 5 minutes |
| Topic Objective | To learn about the problem definition tool of determining where the problem originated. |
| Topic Summary | Start defining a problem by finding out where the problem originated. Ask questions of people who know about the problem to help clarify it. |
| Materials Required | * Worksheet One: Background Information * Module Four Questions from Worksheet |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Four questions for each participant. |
| Recommended Activity | Divide participants into pairs. Ask them to review the case study and begin determining where the problem came from by identifying who to ask and what questions to ask them. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## Defining the Present State and the Desired State

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\39XQYYJK\MC900212061[1].wmfWhen using this tool, you write a statement of the situation as it currently exists. Then you write a statement of where what you would like the situation to look like. The desired state should include concrete details and should not contain any information about possible causes or solutions. Refine the descriptions for each state until the concerns and needs identified in the present state are addressed in the desired state.

|  |  |
| --- | --- |
| Estimated Time | 5 minutes |
| Topic Objective | To learn about the problem definition tool of defining the present state and the desired state. |
| Topic Summary | Comparing a statement of how things currently exist to a statement of the desired state can help define the true problem. |
| Materials Required | * Worksheet One Background Information * Module Four Questions from Worksheet |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Four questions for each participant. |
| Recommended Activity | Divide participants into pairs. Ask them to review the case study and write statements for the present state and the desired state. Have them refine the statements until the desired state clearly addresses the needs in the present state. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## Stating and Restating the Problem

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9MJXCRQW\MC900370220[1].wmfThe problem statement and restatement technique also helps evolve the understanding of the problem. First write a statement of the problem, no matter how vague. Then use various triggers to help identify the true problem. The triggers are:

* Place emphasis on different words in the statement and ask questions about each emphasis.
* Replace one word in the statement with a substitute that explicitly defines the word to reframe the problem.
* Rephrase the statement with positives instead of negatives or negatives instead of positives to obtain an opposite problem.
* Add or change words that indicate quantity or time, such as always, never, sometimes, every, none or some.
* Identify any persuasive or opinionated words in the statement. Replace or eliminate them.
* Try drawing a picture of the problem or writing the problem as an equation.

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| Estimated Time | 5 minutes |
| Topic Objective | To learn about the problem definition tool of stating and restating the problem. |
| Topic Summary | This tool involves stating the problem as well as possible, then using different triggers to help refine the statement until it clearly represents the true problem. |
| Materials Required | * Worksheet One Background Information * Module Four Questions from Worksheet |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Four questions for each participant. |
| Recommended Activity | Divide participants into pairs. Ask them to review the case study and write a general problem statement. Have them use the different triggers to explore the problem. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## Analyzing the Problem

When the cause of the problem is not known, such as in troubleshooting operations, you can look at the what, where, who, and extent of the problem to help define it.

**What? -** “What” questions help to identify the problem. Use “what” questions both to identify what the problem is, as well as what the problem is not. “What” questions can also help identify a possible cause.

**Where? -** “Where” questions help to locate the problem. Use “where” questions to distinguish the difference between locations where the problem exists and where it does not exist.

**When? -** “When” questions help discover the timing of the problem. Use “when” questions to distinguish the difference between when the problem occurs and when it does not, or when the problem was first observed and when it was last observed.

**Extent?** – Questions that explore the magnitude of the problem include:

* How far vs. how localized?
* How many units are affected vs. how many units are not affected?
* How much of something is affected vs. how much is not affected?

Examining the distinctions between what, where, when, and to what extent the problem **is** and what, where, when and to what extent it **is not** can lead to helpful insights about the problem. Remember to sharpen the statements as the problem becomes clearer.

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| Estimated Time | 5 minutes |
| Topic Objective | To learn about the problem definition tool of analyzing the problem. |
| Topic Summary | This tool helps define the problem by distinguishing the difference between what is and what is not, where the problem is, and where it is not, when the problem is, and when it is not, and to what extent the problem exists, and what extent it does not exist. |
| Materials Required | * Worksheet One Background Information * Module Four Questions from Worksheet |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Four questions for each participant. |
| Recommended Activity | Divide participants into pairs. Ask them to review the case study and fill out the chart to analyze the problem with what, where, when, and extent information. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## Writing the Problem Statement

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\1JXY5E11\MC910217216[1].wmfWriting an accurate problem statement can help accurately represent the problem. This helps clarify unclear problems. The problem statement may evolve through the use of the four problem definition tools and any additional information gathered about the problem. As the statement becomes more refined, the types and effectiveness of potential solutions are improved.

The problem statement should:

* Include specific details about the problem, including who, what, when, where, and how
* Address the scope of the problem to identify boundaries of what you can reasonably solve

The problem statement should not include:

* Any mention of possible causes
* Any potential solutions

A detailed, clear, and concise problem statement will provide clear-cut goals for focus and direction for coming up with solutions.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand the purpose and process for writing a problem statement |
| Topic Summary | Writing an accurate problem statement can help accurately represent the problem. This can help clarify unclear problems. The evolution of the problem statement influences the types and effectiveness of potential solutions that may be generated. |
| Materials Required | * Worksheet One Background Information * Module Four Questions from Worksheet * Flip Chart Paper * Markers |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Four questions for each participant. |
| Recommended Activity | Divide participants into pairs. Ask them to review the case study and finalize the problem statement.  Bring the large group back together and write a final problem statement on a sheet of flip chart paper. |
| Delivery Tips | You will need the group final problem statement for module six. |

# Module Five: Preparing for Brainstorming

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\EOAYJ771\MC900234543[1].wmfBefore we learn ways to generate solutions in the problem solving process, we will prepare the way for creativity. This module introduces common mental blocks to productive brainstorming, as well as techniques for dealing with the mental blocks. It also presents some ideas for stimulating creativity.

*No idea is so outlandish that it should not be considered with a searching but at the same time steady eye.*

*Winston Churchill*

## Identifying Mental Blocks

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\1JXY5E11\MC900339222[1].wmfBrainstorming can help you arrive at a solution to the problem, even for problems that seem unsolvable or that seem to only have inadequate solutions. However, before beginning a successful brainstorming session to generate ideas, you must remove any mental blocks. Mental blocks can eliminate great solutions before they are thoroughly examined as possibilities or springboards to other possible solutions.

There are many types of mental blocks. Most blocks to problem-solving fit into the following categories.

* **Emotions**: Emotional blocks can include anything from a fear of risk taking to a tendency to judge or approach the problem with a negative attitude.
* **Distractions**: Too much information, irrelevant information, or environmental distractions can prevent a productive brainstorming session.
* **Assumptions**: If problem solvers assume there is only one correct solution, they will be unable to generate additional ideas. Assumptions also become mental blocks from stereotypes or perceived boundaries where none exist.
* **Culture**: Culture defines the way we live and limits the ideas we may generate or consider. However, not every culture is the same. Sometimes the cultural blocks are unnecessary, and sometimes we do not consider cultural limitations when we should.
* **Communication difficulties:** If we cannot communicate our ideas in some way – speaking, writing, or pictures – these communication difficulties can block our progress in generating ideas.

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| Estimated Time | 10 minutes |
| Topic Objective | To identify categories of mental blocks that inhibit successful brainstorming |
| Topic Summary | Mental blocks can prevent problem solvers from generating effective solutions. There are several different categories of mental blocks. |
| Materials Required | * Index Cards * Markers |
| Recommended Activity | Divide the group into small groups of two or three participants. Have each group generate one or two examples for each type of mental block. After a few minutes, have each small group share their ideas with the rest of the group.  Here are some examples:  **Emotional**: I’ll lose my job if I try that.  Distractions**:** The room is too noisy.  **Assumptions**: There is only one right answer or way to use an object.  **Culture:** Failing to consider urinating on a jellyfish sting because of cultural conditioning.  **Communication difficulties**: Explaining an idea in one way, and getting frustrated when others do not understand. |
| Delivery Tips | Participants might want to keep their own difficult problems in mind for this activity. They will need these examples in the next activity. |

## Removing Mental Blocks

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\39XQYYJK\MC900282912[1].wmfSo what do you do when you identify a mental block? Carol Goman has identified several structured techniques for blockbusting.

The first technique is an attitude adjustment. To remove blocks arising from a negative attitude, list the positive aspects or possible outcomes of the problem. Remember that problems are also opportunities for improvement.

The next technique deals with risk taking. To remove emotional blocks arising from a fear of failure, define the risk, then indicate why it is important. Define what the worst possible outcome might be and what options there are in that scenario. Think about how to deal with that possible failure.

The next technique encourages you to break the rules. Some rules are important, but when rules create an unnecessary imaginary boundary, they must be disregarded so that problem solvers can come up with innovative solutions.

The fourth technique is to allow imagination, feelings, and a sense of humor to overcome a reliance on logic and a need to conduct problem solving in a step-by-step manner.

The fifth technique involves encouraging your creativity. We’ll look at that in more detail in the next topic.

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| Estimated Time | 10 minutes |
| Topic Objective | To learn some techniques for breaking down mental blocks to problem solving |
| Topic Summary | Carol Goman has identified several techniques for breaking down mental blocks to problem solving |
| Materials Required | The index cards of mental block examples generated in the previous activity |
| Recommended Activity | Divide the group into small groups of two or three participants again. Have each group select one or two examples of mental blocks they generated in the previous activity. Have them apply one or more of the blockbuster techniques to the mental block.  After a few minutes, have each small group share their ideas with the rest of the group. |

## Stimulating Creativity

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9PDUOZYV\MC900277490[1].wmfThe creative problem solving process requires creativity. However, many people feel that they are not creative. This is the sign of a mental block at work. Everyone can tap into creative resources in their brains. Sometimes, it just takes a little extra prodding.

Creativity is not something to be turned on and off when needed. The potential for creativity is always there. We just need to learn how to access it.

Here are some tips for creating a creative mental space to encourage productive brainstorming sessions.

* Go outside for a few minutes, especially for a nature walk or bike ride. Exercising and getting sunshine even for just a few minutes are sure ways to redirect your brain to a more creative outlook.
* Change your perspective. Work on the floor or go to the park for you brainstorming session.
* Breathe deeply. Especially when stressed, we tend to become shallow breathers. Fill your entire lungs with air to get some extra oxygen to your brain. Practice deep breathing for 5 to 15 minutes for not only more creativity, but for a great burst of energy.
* Meditate. Focus intently on a candle flame or find another way to quiet your mind of all of your responsibilities and distractions. For a group, try guided meditation.
* Write in a journal. Write for 15-20 minutes in a spare notebook or plain paper. It does not have to be about the specific problem you need to solve, but you may discover some mental blocks if you do write about the problem. Dump all of your mental clutter on to one to three pages that no one will ever see (unless you want them to). Then let the pages and their recorded thoughts go, even if just in your mind.

Once you get your creative juices flowing, keep them going by trying the following ideas everyday:

* Carry a small notebook or jot ideas in your PDA. Be prepared for ideas whenever they come. Ideas often come as you are drifting off to sleep or as you are waking.
* Stretch your boundaries by posing new questions to yourself, learning things outside your specialty, or breaking up set patterns of doing things.
* Be receptive to new, fragile ideas that may still need time to develop.
* Be observant of details, including self details.
* Find a creative hobby, including working puzzles and playing games.

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| Estimated Time | 10 minutes |
| Topic Objective | To learn ways to stimulate creativity |
| Topic Summary | There are several ways to stimulate and maintain a creative approach to life and its problems. |
| Recommended Activity | Have the participants clear their workspace and close their eyes. They may want to put their heads on their desks or even lie on the floor.  Guide the participants to breathe deeply. Perhaps for the first few breaths, count slowly and have them inhale to a count of four, and exhale to a count of four. After several breaths, as the participants start to relax, they might want to stretch their breaths out even longer.  Now ask the participants to imagine they are birds of their choice. Use sensory descriptions to enhance the imagery: the feel of the wind in the feathers, the sound of the bird song, etc. Have the participants imagine they are soaring over a dense forest. Perhaps they land near a bubbling stream and dip their beaks into the cool, clean water.  After a few moments of quiet meditation, guide the participants slowly back in to the room, eventually opening their eyes, and perhaps stretching their arms and legs. |
| Delivery Tips | You might want to turn out the lights for this activity. You may also want to use a recording of soft music or even a recording of a guided imagery or guided meditation. |

# Module Six: Generating Solutions (I)

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\MP321RS9\MC900090572[1].wmfGenerating possibilities for solutions to the defined problem comes next in the process. It is important to generate as many solutions as possible before analyzing the solutions or trying to implement them. There are many different methods for generating solutions. This module begins with some ground rules for brainstorming sessions. Then it presents several idea-generating techniques, including free-association style brainstorming, brainwriting, mind mapping, and Duncker Diagrams.

*Imagination is more important than knowledge.*

*Albert Einstein*

## Brainstorming Basics

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\MP321RS9\MC900285350[1].wmfIn order to come up with a good idea, you must come up with many ideas. The first rule of brainstorming is to come up with as many ideas as you possibly can.

Some of the ideas will not be good. If you start analyzing the ideas while you are generating them, the creative process will quickly come to a halt, and you may miss out on some great ideas. Therefore, the second rule for brainstorming sessions is to defer judgment.

Allow creativity and imagination to take over in this phase of the process. The next rule for brainstorming is to come up with the wildest, most imaginative solutions to your problem that you can. Often we might not consider a solution because of assumptions or associational constraints. However, sometimes those solutions, even if you do not end up implementing them, can lead you to a successful solution. So along with deferring judgment, allow those ideas that might be considered crazy to flow. One of those crazy ideas might just contain the seeds of the perfect solution.

Finally, use early ideas as springboards to other ideas. This is called “piggybacking” and is the next rule for brainstorming.

BasicBrainstorming

Basic brainstorming is a free-association session of coming up with ideas. Use the other group member’s ideas to trigger additional ideas. One member of the group should make a list of all of the ideas.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand some basic rules to encourage a productive brainstorming session and the basic brainstorming method (free-association) |
| Topic Summary | Some ground rules for brainstorming include coming up with many ideas, including wild or zany ideas, deferring judgment, and piggybacking on other ideas. |
| Materials Required | * Worksheet One Background Information * Module Six Questions from Worksheet * Problem Statement generated in Module Four |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Six questions for each participant. |
| Recommended Activity | Divide participants into groups of 4-6. Ask them to review the case study and spend a few minutes brainstorming ideas for the problem. Remind the participants to come up with as many ideas as possible and to defer judgment. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## Brainwriting and Mind Mapping

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9MJXCRQW\MC900332680[1].wmfBrainwriting and Mind Mapping are two additional tools to generate ideas.

**Brainwriting**

Brainwriting is similar to free-association brainstorming, except that it is conducted in silence. This method encourages participants to pay closer attention to the ideas of others and piggyback on those ideas.

Before a brainwriting session, create sheets of paper with a grid of nine squares on each sheet. You will need as many sheets as there are participants in the brainwriting session with one or two extra sheets. Plan to sit participants in a circle or around a table. Determine how long the session will last, and remind participants that there is no talking. Remind participants of the other rules for brainstorming, especially deferring judgment.

For the session itself, state the problem or challenge to be solved. Each participant fills out three ideas on a brainwriting grid. Then he or she places that brainwriting sheet in the center of the table and selects a new sheet. Before writing additional ideas, the participant reads the three ideas at the top (generated by a different participant). The hope is that these items will suggest additional ideas to the participants. The participants should not write down the same ideas they have written on other sheets. This activity continues until all of the grids are full or the time runs out. At the end of the activity, there should be many ideas to consider and discuss.

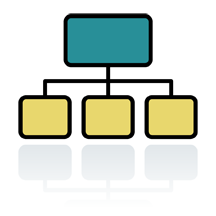
**Mind Mapping**

Mind mapping is another method of generating ideas on paper, but can be conducted alone.

The problem solver starts by writing one main idea in the center of the paper. Write additional ideas around the sheet of paper, circling the idea and connecting the ideas with lines. This technique allows for representing non-linear relationships between ideas.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand two methods of generating ideas for solutions: brainwriting and mind-mapping |
| Topic Summary | Brainwriting is an idea-generating tool that is conducted in silence, but allows participants to piggyback ideas. Mind mapping is an idea generating tool that can be conducted alone and shows non-linear relationships between ideas. |
| Materials Required | * Worksheet One Background Information * Module Six Activities from Worksheet (Brainwriting) * Problem Statement generated in Module Four |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Six Activities for each participant. |
| Recommended Activity | Divide participants into groups of 4-6. Ask them to review the case study and have a brainwriting session. Remind the participants to come up with as many ideas as possible and to defer judgment. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## Duncker Diagrams

Duncker Diagrams are used with the present state and desired state statements discussed in module four. A Duncker diagram generates solutions by creating possible pathways from the present state to the desired state. However, the Duncker diagram also addresses an additional pathway of solving the problem by making it okay not to reach the desired state.

Duncker diagrams can help with refining the problem as well as generating ideas for solutions. The diagram begins with general solutions. Then it suggests functional solutions that give more specifics on what to do. The diagram can also include specific solutions of how to complete each item in the functional solutions.

For example, Michael wanted to address the problem of his job being too stressful. He is responsible for managing up to 1500 work hours per month. He cannot find a way to complete all of his tasks within a desired work week of no more than 45-50 hours per week. He has over 10 years’ experience in public account and is interested in moving into industry. However, he is so busy, that he does not even have time to look for a new job.

The present state and desired state statements are:

* **Present State**: Job requires more demands on my time than I am willing to dedicate to a job I do not really care about.
* **Desired State**: Work a job I care about with adequate free time to spend with family and pursuing personal interests.

Here is what his Duncker diagram might look like.

Delegate more responsibility; Give some jobs to new managers

General Solutions

Functional Solutions

Specific Solutions

Cash in savings; win the lottery

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| Estimated Time | 10 minutes |
| Topic Objective | To understand Duncker diagrams as a tool for generating solutions |
| Topic Summary | Duncker Diagrams are an idea-generating tool that helps problem solvers move from the present state to the desired state. It includes two possible pathways and increasingly detailed information about possible solutions. The |
| Materials Required | * Worksheet One Background Information * Module Six activities from Worksheet (Duncker Diagrams) * Present State and Desired State generated in Module Four |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Six activities for each participant. |
| Recommended Activity | Divide participants into pairs. Ask them to review the case study and develop a Duncker diagram for possible solutions. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

# Module Seven: Generating Solutions (II)

*If you find a good solution and become attached to it, the solution may become your next problem*

*Robert Anthony*

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\31B2RP17\MC900367676[1].wmfThis module presents additional tools and information to consider when generating solutions as part of the creative problem solving process.

## The Morphological Matrix

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FTRMPN7N\MC900082321[1].wmfFritz Zwicky developed a method for general morphological analysis in the 1960s. The method has since been applied to many different fields. It is a method of listing examples of different attributes or issues to an item (or problem), and randomly combining the different examples to form a solution. Depending on the number of issues or attributes identified, there can be quite a large number of possible combinations.

The Morphological Matrix is a grid with several different columns. The problem solvers enter a specific attribute or issue about the item or problem at the top of each column. Then for each column, problem solvers generate a list of examples for that attribute. Once there are many different ideas in the columns, the solutions can be combined strategically or randomly. While some combinations naturally are incompatible, problem solvers should not rule out ideas until they reach the analysis phase of the problem-solving process.

For complex problems, computer-assisted morphological assessment can be done. However, for the scope of this course, we will look a simple example that can be done by hand.

As an example, let’s look at the traffic problems experienced at a new elementary school. The administrative staff of the school has identified the problem statement as: “Get approximately 500 students to class safely, on time, and with no more than a five minute wait for parents and drivers in the neighborhood.” A few sample attributes to this problem are safety, timeliness, pedestrians, and drivers.

A sample chart might look like this:

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| --- | --- | --- | --- |
| **Safety** | **Timeliness** | **Pedestrians** | **Drivers** |
| Extra cross guards | Stagger arrival time by grade | Cross only at crosswalks with crossing guard | Students being dropped off from cars or buses enter at north entrance |
| Policeman giving tickets for rule breakers | Provide incentives for dropping off early | Pedestrians enter at south entrance | Lane for drop off; lane for passing |

This matrix can help identify different considerations of the problem. It can also help formulate comprehensive solutions to complex problems.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand the Morphological Matrix as a tool for generating solutions |
| Topic Summary | The Morphological Matrix is a grid of different attributes about the problem which can help generate random combinations to arrive at possible solutions. |
| Materials Required | * Worksheet One Background Information * Module Seven activities from Worksheet * Problem Statement generated in Module Four |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Seven activities for each participant. |
| Recommended Activity | Divide participants into groups of 4-6. Ask them to review the case study. To fill out the morphological matrix, they should first write attributes along the top of the grid. Help them to consider logistical, ethical, political, and financial aspects of the problem. Then they should fill in examples of each attribute in the appropriate column. Finally, they can pick an item from each column to generate new ideas. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## The Six Thinking Hats

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\OVV8IZ9R\MC900014257[1].wmfDr. Edward de Bono introduced a concept for thinking more effectively in groups in his book, *Six Thinking Hats*. The premise of this idea is that the brain thinks about things in a number of different ways.

The identified different categories of thought are assigned to a color-coded “hat,” as described below. The hats provide a structured way to think about different aspects of a problem.

1. **White hat – Facts and Information**: This hat includes Information collected or identified as missing.
2. **Red Hat** – Feelings and Emotion: This hat includes feelings, including gut reactions to ideas or items identified in another area.
3. **Black Hat – Critical** Judgment: This hat includes details about obstacles to solving the problem or other negative connotations about an item or idea. Since people are naturally critical, it is important to limit black hat thinking to its appropriate role.
4. **Yellow Hat – Positive Judgment**: This hat is the opposite of the black hat. It includes details about the benefits of an idea or issue, or thoughts about favoring an idea. It is still critical thinking and judgment, as opposed to blind optimism.
5. **Green Hat – Alternatives and Learning**: This hat concerns ideas about new possibilities and thinking about implications rather than judgments. Green hat thinking covers the full spectrum of creativity.
6. **Blue Hat – The Big Picture**: This hat serves as the facilitator of the group thinking process. This hat can be used to set objectives both for the problem solving process and the thinking session itself.

The six thinking hat methodology allows a deliberate focusing during problem solving sessions, with an agreed-upon sequence and time limit to each hat. It ensures that everyone in the group is focused on a particular approach at the same time, rather than having one person reacting emotionally (red hat) while others are being objective (white hat) and still another is wearing the black hat to form critical judgments of ideas.

The green hat is the main thinking hat for generating solutions in the problem solving process. The other hats can be used as a reminder of the rules of productive brainstorming sessions, such as limiting critical judgment (positive and negative – yellow and black hats).

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| Estimated Time | 10 minutes |
| Topic Objective | To understand the six thinking hats as a tool for productive collaborative thinking sessions |
| Topic Summary | The six thinking hats were identified by Dr. Edward de Bono as a method for structuring and focusing thought into different categories to help ensure that group thinking sessions stay productive by keeping everyone on the same page. |
| Materials Required | * Prepared sheets of flip chart paper * Markers |
| Planning Checklist | Each sheet of flip chart paper should be divided into six columns. Each column should be headed with a thinking hat. They may be color-coded if desired. |
| Recommended Activity | Read the following list of comments to the group. Call on participants to identify which thinking hat is speaking. Add the comment to the appropriate column of the flip chart paper, if desired. Our answers are included.   * The sales for this product declined 15% in the last two months. (WHITE HAT) * I don’t like that assignment. (RED HAT) * We cannot find enough capital for that project. (BLACK HAT) * That approach would also lower our environmental impact. (YELLOW HAT) * What if we incorporate new communication methods in class? (GREEN HAT) * Let’s revisit our objectives. (BLUE HAT) |
| Delivery Tips | Ask the participants for additional examples for each type of hat if time permits. |

## The Blink Method

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FTRMPN7N\MC900339198[1].wmfMalcolm Gladwellpopularizes scientific research about the power of the adaptive unconscious in his book *Blink: The Power of Thinking Without Thinking*. Gladwell’s premise is that in an age of information overload, our decisions based on limited information are often as good as or better than decisions made with ample critical thinking.

In the examples and research Gladwell presents, experts and average subjects alike are better able and happier with choices made through what he calls “thin-slicing,” or coming to a conclusion with limited information. An example presented is the case in which many experts identify a statue as a fake, when the museum that spent money on the statue did not identify it as such with weeks of research.

Gladwell also presents the cautions of the adaptive unconscious. Our power to make effective decisions by tapping into this power can be corrupted by personal likes and dislikes and stereotypes. Rapid, intuitive judgment can have disastrous consequences, as presented in his example of an innocent man shot on his own doorstep 41 times by New York policemen.

Gladwell summarizes the dilemma between when to tap into our unconscious, and when to use a more critical approach as thus: “On straightforward choices, deliberate analysis is best. When questions of analysis and personal choice start to get complicated – when we have to juggle many different variables – then our unconscious thought process may be superior.”

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| Estimated Time | 10 minutes |
| Topic Objective | To understand the power and challenges of quick, unconscious decisions |
| Topic Summary | Malcom Gladwell presents research about the adaptive unconscious in his book *Blink: The Power of Thinking Without Thinking.* He suggests that although there are shortcomings to the approach (such as personal preference and stereotyping), in an age of information overload, “rapid cognition” is often more effective than a more deliberate approach. |
| Recommended Activity | Have the participants share examples of decisions they have made using rapid cognition. How happy were they with those decisions? Are there examples of using the “blink” method that ended badly? |
| Stories to Share | Share examples from the book if time permits. |

# Module Eight: Analyzing Solutions

*When I’m working on a problem, I never think about beauty. I think only how to solve the problem. But when I have finished, if the solution is not beautiful, I know it is wrong.*

*R. Buckminster Fuller*

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9PDUOZYV\MC900082259[1].wmfWith many different solutions in hand, the problem solvers need to analyze those solutions to determine the effectiveness of each one. This module helps participants consider is the criteria or goals for solving the problem, as well as distinguishing between wants and needs. This module also introduces the cost/benefit analysis as a method of analyzing solutions.

## Developing Criteria

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\EOAYJ771\MC900281011[1].wmfReturn to the information generated when defining the problem. Consider who, what, when, where, and how that the potential solution should meet to be an effective solution to the problem.

When developing criteria that possible solutions to the problem should meet, also consider the following:

* Ask questions such as “Wouldn’t it be nice if...” or “Wouldn’t it be terrible if...” to isolate the necessary outcome for the problem resolution.
* Think about what you want the solution to do or not do.
* Think about what values should be considered.

Use the answers to these questions as the starting point for your goals or problem-solving criteria.

Additionally, the criteria for an effective solution to the problem should consider the following:

* **Timing** – Is the problem urgent? What are the consequences for delaying action?
* **Trend** – What direction is the problem heading? Is the problem getting worse? Or does the problem have a low degree of concern when considering the future of the circumstances?
* **Impact** – Is the problem serious?

It is important to think about what the circumstances will look like after a successful solution has been implemented. Use your imagination to explore the possibilities for identifying goals or criteria related to the problem.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand the types of criteria to consider when evaluating solutions |
| Topic Summary | Consider the timing, the trend, and the impact of the problem to develop criteria against which to evaluate potential solutions to the problem. Also imagine the possibilities when the problem is solved to help develop goals the solutions should address. |
| Materials Required | * Worksheet One Background Information * Module Eight activities from Worksheet |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Eight activities for each participant. |
| Recommended Activity | Divide participants into groups of 4-6. Ask them to review the case study and answer the questions on the Module Eight activities sheet Developing Criteria. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## Analyzing Wants and Needs

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9PDUOZYV\MC900311860[1].wmfThe creative problem solving process is a fluid process, with some steps overlapping each other. Sometimes as the process provides additional information, problem solvers need to go back and refine the problem statement or gather additional information in order to effectively solve the problem.

Wants and needs seem like a fundamental aspect of defining the problem. However, in order to analyze the potential solutions, the wants and needs for the desired state after the problem is solved must be very clear.

Needs are items the potential solution absolutely must meet. If the potential solution does not meet a need requirement, you can disregard it from further analyzing.

Wants are nice to have items. You can provide a weight to each item to indicate its importance. For each potential solution, you can provide a rating for how well the solution addresses the selected want. Multiply the rating by the weight of the want to score the potential solution.

With scores for each item, it is an easy matter to rank the potential solutions in order of preference.

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| Estimated Time | 10 minutes |
| Topic Objective | To learn how to analyze wants and needs for a potential solution to a problem and to compare the ratings between several potential solutions. |
| Topic Summary | Analyzing wants and needs can help to narrow down a list of potential solutions for a problem. |
| Materials Required | Automotive section of newspaper |
| Recommended Activity | Divide the participants into small groups. Give each group an automotive section of the newspaper to complete the activity.  The scenario is that you need to buy a new car. You can spend $18,000 on the car, but the budget for buying gas is limited. Parking is also limited, ruling out larger vehicles. You have a long commute and will be the only person using the car. It does not need to carry large amounts or bulky items.  Determine three possible solutions, using the automotive section of the newspaper. Then make a list of needs and determine if the potential solutions meet those needs. Make a list of wants and provide a weight for each want. Then rank each solution and come up with a score (weight x rank) for each possibility. |

## Using Cost/Benefit Analysis

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\1JXY5E11\MC900047769[1].wmfCost – benefit analysis is a method of assigning a monetary value to the potential benefits of a solution and weighing those against the costs of implementing that solution.

It is important to include ALL of the benefits and costs. This can be tricky, especially with intangible benefits (or costs). Some benefits or costs may be obvious, but others may take a little digging to uncover. For example, imagine you want to replace three employees with a machine that makes stamps. A hidden benefit is that you may be able to use large feed stock instead of individual sheets, saving materials costs. In the same example, you would not only consider the salaries of the employees, but the total cost for those employees, including benefits and overhead.

The value assigned to the costs and benefits must be the same unit, which is why monetary value is suggested. The valuations assigned should represent what the involved parties would actually spend on the benefit or cost. For example, if people are always willing to save five minutes and spend an extra 50 cents on parking closer, they are demonstrating that time is worth more than 10 cents per minute. The considerations should also include the time value of money, or the value of money spent or earned now versus money spent or earned at some future point.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand cost-benefit analysis |
| Topic Summary | Cost –benefit analysis is an analysis tool that assigns a monetary value to all costs and benefits associated with a solution, including intangible ones. |
| Materials Required | * Worksheet One Background Information * Module Eight activities from Worksheet |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Eight activities for each participant. |
| Recommended Activity | Divide participants into groups of 4-6. Ask them to review the case study and select one potential solution generated in module six or seven. Have them use that solution to answer the questions on the Module Eight activities sheet Cost Benefit Analysis. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

# Module Nine: Selecting a Solution

The next step in the process is to select one or more solutions from the possibilities. In the previous step, you will have eliminated many of the possibilities. With a short list of possibilities, you can do a final analysis to come up with one or more of the best solutions to the problem. This module discusses that final analysis, as well as a tool for selecting a solution called Paired Comparison Analysis. It also discusses analyzing potential problems that may arise with a selected solution.

*Again and again, the impossible problem is solved when we see that the problem is only a tough decision waiting to be made.*

*Robert H. Schuller*

## Doing a Final Analysis

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\1JXY5E11\MC900441517[1].wmfIn the previous stage of the process, you performed a cost/benefit analysis. However, since we cannot always know all of the potential variables, this analysis should not be the only one you perform.

For each potential solution, you must weigh the potential advantages and disadvantages. Consider the compatibility with your priorities and values. Consider how much risk the solution involves. Finally, consider the practicality of the solution. It may be helpful to create a map for each solution that addresses all of the relevant issues.

Consider the potential results of each solution, both the immediate results and the long-term possibilities.

In the final analysis, you will refine your shortlist and keep re-refining it until you determine the most effective solution.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand performing a final analysis of remaining solutions |
| Topic Summary | The final analysis of potential solutions is the time to weigh all of the advantages and disadvantages of a solution. Consider the compatibility with priorities and values, including the criteria developed in the solution analysis phase of the problem solving process. |
| Materials Required | * Worksheet One Background Information * Module Nine activities from Worksheet |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Nine activities for each participant. |
| Recommended Activity | Divide participants into groups of 4-6. Ask them to review the case study and select one potential solution generated in module six or seven. Have them use that solution to answer the questions on the Module Nine activities sheet Final Analysis. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## Paired Comparison Analysis

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FZCJR17Y\MC900231572[1].wmfThe Paired Comparison Analysis tool is a method of prioritizing a small number of workable solutions. The first step for using this tool is to list all of the possible solutions. Label each potential solution with a letter or number.

Next, compare the solutions in pairs. Decide only between those two which solution is preferable. Assign a number to indicate the strength of the preference for each option. For example, problem solvers could assign a “3” to items they strongly prefer, a “2” to a moderate preference, or a “1” to a mild preference.

This first round continues two at a time until all of the solutions are ranked. Then all the ranks are added together to obtain a priority score for each item. The top score is the preferred solution.

For example, imagine that a group of children are deciding which fairy tale to perform in a school play. They have listed six favorites:

A) Sleeping Beauty B) Cinderella C) Snow White

D) Jack and the Beanstalk E) Hansel and Gretel F) The Three Little Pigs

Their chart might look like this:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A – B 2 | A – C 3  B – C 1 | A – D 3  B – D 2  C – D 3 | A – E 1  B – E 1  C – E 1  D – E 2 | A – F 1  B – F 2  C – F 2  D – F 2  E – F 3 |

A = 1 B = 5 C = 4 D = 12 E = 1 F = 6

In this example, the clear winner is choice D, or Jack and the Beanstalk.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand the paired comparison analysis as a tool for selecting a solution |
| Topic Summary | The Paired Comparison Analysis tool is a method of prioritizing a small number of workable solutions to choose one solution. |
| Materials Required | * Worksheet One Background Information * Module Nine activities from Worksheet |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Nine activities for each participant. |
| Recommended Activity | Divide participants into groups of 4-6. Ask them to review the case study and select several solutions generated in modules six and seven. Have them answer the questions on the Module Eight activities sheet Paired Comparison Analysis. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## Analyzing Potential Problems

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\39XQYYJK\MC900370012[1].wmfThink forward to the solution implementation. Ask how, when, who, what, and where in relation to implementing the solution. Does the imagined future state with this problem solution match the desired state developed earlier in the process?

Brainstorm for potential problems related to the solution. Consider how likely potential problems might occur and how serious they are. These potential issues can then be evaluated as needs and wants along with the other criteria for evaluating the solution.

Sometimes this analysis can uncover a potential hardship or opportunity that changes the criteria, problem definition, or other aspects of the problem solving process. Remember to be flexible and revisit the other stages of the process when necessary.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand analyzing potential problems that may develop as a result of selecting a particular solution |
| Topic Summary | Before implementing a solution, make sure that you understand the potential problems. Potential hardships (or opportunities) may arise as you consider the how, when, who, what, and where of the solution implementation. |
| Materials Required | * Worksheet One Background Information * Module Nine activities from Worksheet |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Nine activities for each participant. |
| Recommended Activity | Divide participants into groups of 4-6. Ask them to review the case study and select one potential solution generated in module six or seven. Have them use that solution to answer the questions on the Module Nine activities sheet Potential Problems. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

# Module Ten: Planning Your Next Steps

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FTRMPN7N\MC900295546[1].wmfOnce you have selected one or more solutions to the problem, it is time to implement them. This module looks at identifying tasks and resources, and re-evaluating the solution and adapting as necessary.

*Even if you’re on the right track, you’ll get run over if you just sit there.*

*Will Rogers*

## Identifying Tasks

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\MP321RS9\MC900295363[1].wmfThis part of the creative problem solving process is the time to think about the steps for making the solution become reality. What steps are necessary to put the solution into place?

Brainstorm with people involved with the problem to determine the specific steps necessary to make the solution become a reality. At this stage of the process, working with a smaller group may be more effective, unless you need approval from a large group. While making that list, identify any tasks that are critical to the timing of the solution implementation. Critical tasks are items that will delay the entire implementation schedule if they are not completed on time. Non-critical tasks are items that can be done as time and resources permit.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand the step of identifying tasks in order to implement a selected solution |
| Topic Summary | This part of the creative problem solving process is the time to think about the steps for making the solution become reality. |
| Materials Required | * Worksheet One Background Information * Module Ten activities from Worksheet |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Ten activities for each participant. |
| Recommended Activity | Divide participants into groups of 4-6. Ask them to select one solution generated in module six or seven. Have them use that solution to answer the questions on the Module Ten questions sheet Identifying Tasks. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## Identifying Resources

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\3YJGCFYP\MC900055282[1].wmfThis part of the creative problem solving process is the time to think about the resources for making the solution become reality. What else is necessary to put the solution into place?

The types of resources that may be involved are listed below, along with some questions to think about to assign resources to the project of implementing the solution.

* **Time:** How will you schedule the project? When would you like the solution completed? How much time will each task identified take?
* **Personnel:** Who will complete each identified task?
* **Equipment:** Is there any special equipment required to implement the task? Does the equipment exist or need to be obtained?
* **Money**: How much will the solution cost? Where will the money come from?
* **Information:** Is any additional information required to implement the solution? Who will obtain it? How?

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| Estimated Time | 10 minutes |
| Topic Objective | To understand the resources necessary to implement the solution |
| Topic Summary | Resources can be time, personnel, equipment, money, or information. Necessary. This part of the creative problem solving process is the time to think about the resources necessary for making the solution become reality. |
| Materials Required | * Worksheet One Background Information * Module Ten activities from Worksheet |
| Planning Checklist | Print out one copy of the Worksheet One case study and the Module Ten activities for each participant. |
| Recommended Activity | Divide participants into groups of 4-6. Ask them to select one solution generated in module six or seven. Have them use that solution to answer the questions on the Module Ten questions sheet Identifying Resources. |
| Delivery Tips | If there is time, bring the large group back together, and discuss results. |

## Implementing, Evaluating, and Adapting

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\39XQYYJK\MC910217102[1].wmfOnce you have determined the tasks and the resources necessary to implement the solution, take action! Now is the time to use your project management skills to keep the solution implementation on track.

As part of the implementation process, you will also continue to evaluate the solution(s). It is important to be flexible and adapt the solutions as necessary, based on the evaluation of the solution’s effectiveness at solving the problem. You may need to make adjustments to the plan as new information about the solution comes to light.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand implementing the solution and evaluating and adapting as the project progresses |
| Topic Summary | As part of the implementation process, you will also continue to evaluate the solution(s). It is important to be flexible and adapt the solutions as necessary, based on the evaluation of the solution’s effectiveness at solving the problem. |
| Recommended Activity | Have the participants generate a list of questions to ask to help evaluate a solution as it is being implemented. Suggestions include *Does the solution solve the real problem (rather than symptoms)? Is the problem permanently solved? Have all the positive and negative consequences been examined?*  Write the suggestions on a sheet of flip chart paper. |

# Module Eleven: Recording Lessons Learned

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\EOAYJ771\MC900071005[1].wmfOnce you have solved the problem successfully, it is time to apply what you have learned to make solving future problems easier.

*The real problem is what to do with problem solvers after the problem is solved.*

*Gay Talese*

## Planning the Follow-Up Meeting

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\3YJGCFYP\MC900436996[1].wmfHave a follow-up meeting after the solution has been implemented. Here are some things to consider when planning this meeting:

* Make sure you have a clear agenda for the meeting. The purpose of this meeting is to conduct a final evaluation of the problem, the selected solution, and the implementation project. Use the follow up meeting to find out if any of the team members still have frustrations about the problem or its solution. It is also time to celebrate successes and identify improvements, discussed in the next two topics.
* Make sure to invite all of the team members involved with the creative problem solving process and the solution implementation.
* Make sure to consider the meeting arrangements, such as refreshments and equipment needed.
* Invite the participants in plenty of time, to make sure that all key members can be present for the meeting. Make such each participant knows the purpose of the meeting so that all have the appropriate incentive to attend.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand how to prepare for a problem solution implementation follow up meeting |
| Topic Summary | After the solution to the problem has been implemented, have a follow up meeting to discuss the problem, the selected solution, and the implementation. Make sure all key team members are present for the meeting so that you can also celebrate successes and identify improvements. |
| Materials Required | Worksheet One Background Information |
| Planning Checklist | Print out one copy of the Worksheet One case study for each participant. |
| Recommended Activity | In a large group, brainstorm to evaluate the creative problem solving steps practiced in this workshop. What might the problem solvers for this real problem need to discuss after the solution has been implemented? |

## Celebrating Successes

C:\Users\Darren\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\ZKNEI80I\MC900437000[1].wmfAfter the problem has been solved, take the time to celebrate the things that went well in the problem solving process. Try to recognize each person for their contributions and accomplishments.

You can celebrate successes by recognizing the contributions of the team members in the follow-up meeting. Alternatively, you can have a party or other form of celebration. A good activity just needs to help the team celebrate a job well done in coming up with all the solutions, evaluating them, and finally implementing a solution effectively.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand the important of having a celebration at the end of the project. |
| Topic Summary | After the problem has been effectively solved, take time to celebrate the things that the team did well. |
| Recommended Activity | Brainstorm how the school district problem solvers in the case study could celebrate their success with implementing an effective solution to the problem. What could they do to encourage team morale? |

## Identifying Improvements

There have probably been some bumps along the road in the creative problem solving process. Take the time to identify lessons learned and ways to make improvements so that the next problem solved will be even better.

Meeting with team members and stakeholders to identify improvements is a valuable exercise for several reasons.

* It ensures everyone is aware of the challenges encountered and what was done to resolve them.
* If something is learned from a mistake or failed endeavor, then the effort put into the task is not entirely wasted.
* Participants can apply these lessons to future problems and be more successful.

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| Estimated Time | 10 minutes |
| Topic Objective | To understand how to identify lessons learned throughout the creative problem solving process |
| Topic Summary | There have probably been some bumps along the road in the creative problem solving process. Take the time to identify lessons learned and ways to make improvements so that the next problem solved will be even better. |
| Materials Required | * Flip chart paper * Markers |
| Recommended Activity | In a large group, discuss what participants learned during the workshop. |
| Stories to Share | This activity is important for all problems solved, no matter what their size. |
| Delivery Tips | This activity can also be performed in small groups. |
| Review Questions | Why is it important to identify improvements? |

# Module Twelve: Wrapping Up

Although this workshop is coming to a close, we hope that your journey to improve your creative problem solving skills is just beginning. Please take a moment to review and update your action plan. This will be a key tool to guide your progress in the days, weeks, months, and years to come. We wish you the best of luck on the rest of your travels!

*The problem is not that there are problems. The problem is expecting otherwise and thinking that having problems is a problem.*

*Theodore Rubin*

## Words from the Wise

* **MC900370486[1]John Foster Dulles (former Secretary of State):** The measure of success is not whether you have a tough problem to deal with, but whether it is the same problem you had last year.
* **Henri Kaiser:** Problems are only opportunities in work clothes."
* **Albert Einstein:** The significant problems we face cannot be solved at the same level of thinking we were at when we created them.

## Parking Lot

Review the items on the parking lot. Some items may need one-to-one participant follow up. You may be able to clear other items up now. Follow-up workshops may even be appropriate.

## Action Plans and Evaluations

Do a quick round robin and ask everyone to share one thing that they learned today. Then, ask participants to make sure their action plans and evaluations are complete.

If possible, ask participants to buddy up and set up a follow-up system, so that they can check up on each other in the coming days, weeks, and months. If appropriate, provide your contact information in case they have any questions.