

Thinking Creatively

Activity

Instructor Guide

Note to Instructor

This activity is an inquiry activity that is intended to get the participants “thinking” and analyzing their own thought processes. Participants solve three puzzles and then analyze their processes and limitations in solving the problems. This activity is intended to be completed prior to starting this learning module.

The *Systematic Problem Solving Learning Module* consists of the following:

- **Activity: Thinking Creatively**
- A Systematic Approach to Problem Solving PK (Reading material)
- Brainstorming Activity
- Problem Solving Activity – The Lawn
- Problem Solving Tools PK (Reading material)
- Problem Solving Activity – A MEMS Process Problem

This Instructor Guide (IG) contains all of the information in the Participant Guide (PG) as well as answers to the activities.

Activity Description

The purpose of this activity is to get “thinking” by solving a few puzzles and then identifying your thought process in solving the puzzles. Solving problems is a daily task for all of us in our personal lives and for most of us on the job. It is important to understand your own thought processes – strengths and limitations - and to explore your creative thinking ability. Do you think inside the box or out? Is your process scattered or organized? In the following activities you’ll be asked to think creatively and to work with others to strengthen your creative problem solving abilities.

Objective

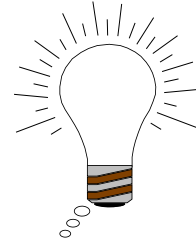
After completing three puzzle type problems, describe your thinking process – the process you used to solve each of the problems.

Introduction

Thomas Edison had a unique way of hiring engineers. He'd give the applicant a light bulb and ask,

"How much water will it hold?"

Two methods were used to solve this problem. The first method was to use gauges to measure all the angles of the bulb. Then with the measurements in hand, the engineer would calculate the volume of the bulb and thus the volume of water it would hold. This approach could take as long as twenty minutes.



The second method was to fill the bulb with water and then pour the contents into a measuring cup. Total elapsed time: about a minute.

Engineers who used the first method were thanked politely for their time and sent on their way. Those who used the second method, would hear Edison say, *"You're hired!"*

(Excerpt from David Armstrong, *Managing by Storying Around*, Doubleday, NY,NY.)

Why do you think Edison hired the engineer who used the measuring cup instead of the engineer who used the gauges?

Which method was the most "creative" method for solving the problem?

Which method was the "learned" method for solving the problem?

In using the "bulb" problem in his interviews, Edison was looking for the educated engineer who had maintained the "beginner's mind". He wanted the person who had the knowledge required to do the job, but had kept the imagination necessary to be creative.

Question for the inquisitive mind: Was any information missing in this story? In other words, was there anything that the reader had to assume in order for this story to make sense?

***Answer:** Answers may vary, but one obvious problem with this story is "not knowing" exactly how Edison presented the light bulb? If the base of the base had already been removed, then this story would made sense. If not, then how did people who chose the second method, deal with getting water inside a sealed bulb? The purpose of this exercise is twofold: The "learned" method is not always the best method (it take creativity plus knowledge to solve problems) and, as an effective problem-solver, you need as much information about the problem as you can get in order to solve the problem using the best method.*

Problem Solving and Industry

With the rapid growth of technology industries and the introduction of new products, it has become a requirement for new employees to demonstrate creative abilities to solving problems. Everyone is expected to take part in solving the problems pertaining to product, equipment, safety, and quality improvement. All employees are expected to be able to solve problems creatively and in a timely fashion, to work with others in solving these problems, and to be able to discuss and record the process. In other words, all employees must exhibit good problem solving skills, team skills, and communication skills!

When people generate ideas, ideas lead to creativity. Without creativity we wouldn't have computers, cars, airplanes, radios, or TVs. CREATIVITY is important. People must be willing to think with open minds, generate new and seemingly "wild" ideas. We all need to recognize our own level of creativity and learn to use it at work, not just at play.

Here's how J.M. Barrie, the creator of Peter Pan, used his creativity to solve a rather dangerous situation.

In 1904, when Peter Pan began playing in London, the children were so enthralled by the flying hero of Never-Never Land that they took his words literally: If they believed strongly enough, then they would be able to fly.

J.M. Barrie, the imaginative creator of Peter Pan, began hearing from distraught parents whose children had been injured attempting to fly. He could have issued a statement or written a disclaimer for parents who brought their children to the play. Instead, he incorporated a light change into Peter's formula for flying. His solution was effective, imaginative, and long-lasting. His solution perfectly fit the situation and even improved on what originally existed -- the ideal way to solve a problem. From then on, in order to fly, the children in the story needed to be sprinkled with the dust of Tinker Bell, a pixie.

*Front Line Supervisor's Bulletin,
Bureau of Business Practice, Waterford CT*

Pretty clever solution, wouldn't you say?

Let's check out your imagination.

EXERCISE 1: Alphabet Soup

Part I: Time yourself to see how long it takes you to answer the following five questions. What single letter of the alphabet answers each of the following questions.

1. What is the only letter open on all sides? _____ *(Answer: X)*
2. What is the only curved letter that is the same upside down? _____ *(Answer: O)*
3. What are the letters containing only one single horizontal line? _____ *(Answer: A, H, L, T)*
4. What are the two letters with two parallel horizontal lines? _____ *(Answer: F, Z)*
5. What two letters are made by two diagonal straight lines? _____ *(Answer: V, X)*
 - a. How long did it take you?
 - b. What was your process? (e.g., I could see the answer right away, I went through the alphabet)
 - c. On a scale of 1 to 5, with 5 being "Very difficult" and 1 being "very easy", how easy/difficult did you find this exercise?

1	2	3	4	5
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 - d. Did you get all of the answers? YES / NO
 - e. If you didn't get them all, how many did you get? _____

Part II: Time yourself to see how long it takes you to answer the following questions. What letter of the alphabet is

1. a bird? _____ *(Answer: J)*
2. part of your head? _____ *(Answer: I)*
3. an insect? _____ *(Answer: B)*
4. a drink? _____ *(Answer: T)*
5. a building extension? _____ *(Answer: L)*
6. a vegetable? _____ *(Answer: P)*
7. a body of water? _____ *(Answer: C)*
8. a farm animal? _____ *(Answer: U)*

- How long did it take you?
- What was your process? (e.g., I could see the answer right away, I went through the alphabet)
- On a scale of 1 to 5, with 5 being "Very difficult" and 1 being "very easy", how easy/difficult did you find this exercise?

1 2 3 4 5

- Did you get all of the answers? YES / NO
- If you didn't get them all, how many did you get? _____

Let's do one more exercise to stimulate your thinking and creativity.

EXERCISE 2: One Step at a Time

In columns 1 and 5 there are 10 nouns. These nouns were chosen at random, so at the moment, there is really no relationship between them. It is your job to create a relationship. For example, let's say I gave you the 2 nouns - apple and TV set. Notice how the 3 words in the middle have created an association between these 2 nouns.

Apple computer port HMDI TV set

Create a relationship between the nouns in Column 1 and Column 5. Do the first two rows yourself, then team up with someone to complete rows 3 through 5.

Column 1	2	3	4	5
Car				Dog
Teacher				Tree
Earth				Telephone
Clock				Rug
Book				Radio

Compare what others came up with for the first two rows. Was the relationship they developed different from yours? YES / NO

Was it easier to form a relationship between words when working with someone? YES / NO

Others can help to stimulate your creative thinking.

Do this exercise again. However, this time, *you* come up with the nouns for columns 1 and, at the same time (without peeking) have someone else come up with the nouns for column 5.

Don't think about it. Just write down some nouns and then enter them into the columns.

Now create the first two relationships by yourself.
Working with the other person, complete the last three rows.

Column 1	2	3	4	5

Rate the difficulty of this exercise (5=very difficult, 1=very easy)

- a. when working alone 1 2 3 4 5
- b. when working with others 1 2 3 4 5

Check out the solutions that other people came up with. Notice how that even though you all were able to develop a relationship, the relationships differed. How can this help when solving a problem with someone else?

***Answer:** People think differently, so others can come up with different ideas and solutions that you might not have thought of. These differences provide options and alternative ways to solve a problem or to find the root cause of a problem.*

What did you learn about your own thinking process from these exercises?

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