

Surprise Quiz 1

(2k13)

Question:

Explain Hawthorne Effect?

*The person who follows the crowd will usually get no further than the crowd.
The person who walks alone is likely to discover places no one has ever been
before.*



Strategies for Creative Problem Solving

What Is Creativity?

Creativity is a distinguishing characteristic of human excellence in every area of behavior.

—E. Paul Torrance



Three Myths

1. Mystery

Some people believe that creativity is something so mysterious it cannot be studied productively.

2. Magic

A trick that certain people know and if you talk about how the trick is done you will take away the “magic.”

3. Madness

To be Creative One must be weird, strange, or abnormal



Noller's Symbolic Formula for Understanding Creativity

$$C = f_a(K, I, E)$$

Creativity is a function of Knowledge, Imagination, and Evaluation, reflecting an interpersonal attitude toward the beneficial and positive use of creativity.

Definition

Creativity is the process of generating ***unique*** products by transformation of existing products. These products must be ***unique*** only to the creator, and must meet the criteria of purpose and value established by the creator.

Problem Solving Strategies-Why Bother?

- Real Problems have multiple solutions
- More complex problem more alternative solutions

Goal

- To pick best solution

To become

Problem solving *“Street Smart”*



What is the real problem?

A student and his professor are backpacking in Alaska when a grizzly bear starts to chase them from a distance. They both start running, but it's clear that eventually the bear will catch up with them. The student takes off his backpack, gets his running shoes out, and starts putting them on. His professor says, "You can't outrun the bear, even in running shoes!" The student replies, "I don't need to outrun the bear; I only need to outrun you!"

Problem Definition...

The student realized that the bear would be satisfied when he caught one person; consequently the student defined the **real problem** as outrunning the professor rather than the bear. This example illustrates a very important point: *problem definition*.

Problem Definition

- Common but difficult task
- Problems are disguised in variety of ways
- Ill defined problems lead engineers to wrong path
- Identification of real problem is critical to workable solution
- We can be tricked into treating symptoms rather than solving root problems

Impatient Guests (1)

Scenario

- Renovation of upper floors of high rise hotel
- Guests complained of slow elevators

Manager's first solution

Speed up the elevators....failed!

Install a new elevator.... Couldn't execute the idea

Real Problem and its Solution

RP

To get off guests minds from wait

Creative Solution

“Mirrors were installed on each floor in front of elevators”



Leaking Flow Meter

Scenario

- Flow meter used in gasoline pumps
- Leakage after some time

Manager's Instructions

- Find a material that corrosion free

Result

- No material found
- No company found that can give this solution

Real Problem and its Solution

RP

- Stop leaking the flow meter on the floor

Creative Solution

- Replace the flow meter at specified time period before it starts leaking



Bargain Prices

Scenario

- Rainforest crunch
- Sales are low

Store manager's Instructions

- Lower the price
- Lower the price
- lower the price

Price Reduced
\$14.99
\$12.99
\$10.99
\$9.99

Real Problem and its Solution

RP

- Problem was not the high price of the item
- Display of item was not at prominent place

Solution

- To display the rainforest crunch at prominent place
- Visible to customers



Rainforest Crunch Bars

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INGREDIENTS

- 1 cup of oats
- 1/2 cup of plain white flour
- 1/2 cup of demerara sugar
- 3oz margarine
- 2 tablespoons of golden syrup
- 1/2 teaspoon of water
- 1/2 teaspoon of vanilla essence
- 1/2 teaspoon of bicarbonate of soda
- 1/2 a cup of two of the following:
 1. banana chips
 2. chopped ginger
 3. dried pineapple chunks
 4. chocolate chips

METHOD

1. Melt the margarine, syrup and water in a saucepan over a low heat.
2. Into a mixing bowl, measure out all of the dry ingredients.
3. When the margarine mixture has cooled down a bit, add the vanilla essence.
4. Place the melted in ingredients into the bowl with the dry ingredients and mix well.
5. Press into a rectangular baking tray (roughly 6x9 inches).

Where is the oil?

- Water flooding is used to recover oil
- Water is injected to push oil to nearby well
- Oil recovery was very low

Manager's Instructions

- Find out ways to improve recovery of oil
- For 20 years expensive studies were done to solve problem
- No improvement made

Real Problem and its Solution

RP

Why was well not producing expected amount
of oil

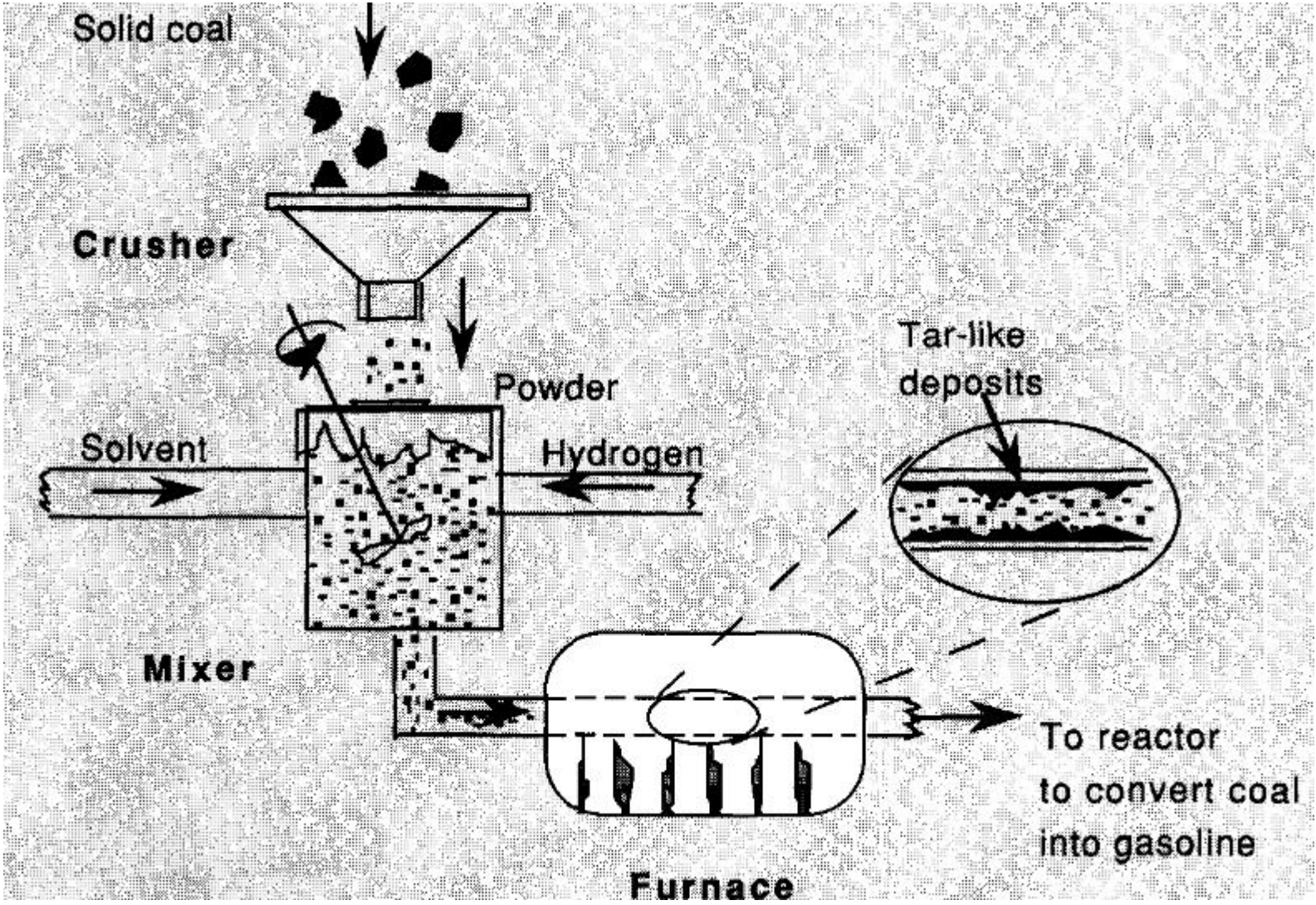
Solution

Make precision in calculations

Making Gasoline from Coal

Scenario

- To make liquid petroleum products from coal
- Coal particles are mixed with hydrogen
- Pass through furnace



Manager's Instructions

- Develop a solvent that dissolve coal efficiently so that it can not deposit on surface of pipe
- 18 months of research work could not produce any thing beneficial

What do you think?

Real Problem and its Solution

RP

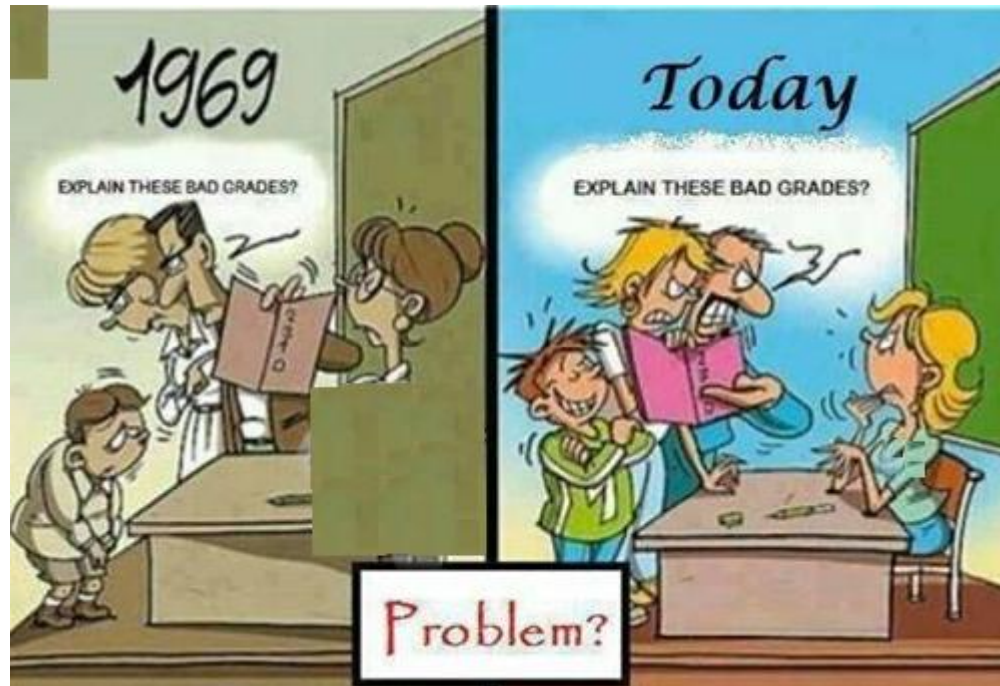
Determine how carbon deposits are forming and how they can be eliminated

Solution

Speed up the flow through pipe

How?

By reducing the diameter of pipe



Correct Problem Wrong Solution

Unexpected Twist

A factory destroyed, England

Inflammable chemical got ignition

Middle unit was inefficient

“Remove and repair the middle unit”

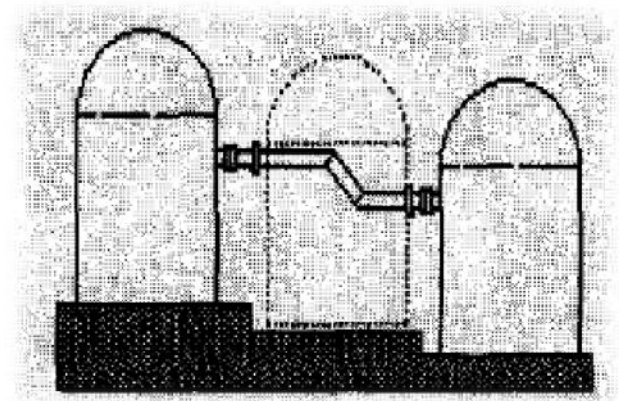
Problem

Pipe twisted due to pressure and

Ruptured

Reason

Chalk Drawing



Reading Assignment

Case Studies

1. Printing Inks
2. Decreasing Profit

