If we are satisfied that we have defined the real problem, we next need to determine if it is worth solving.

Does it seem worth solving?

Has it been solved before (or is a suitable solution apparent)?

Are the necessary resources available?

Is there sufficient time?

If any of these answers is "no", can the constraints be changed?

To succeed, ultimately you must:

- – define the correct problem,
- – select the best/acceptable solution for that problem.

You can't select an acceptable solution unless it gets on the list of potential solutions to be evaluated.

You need an effective process for generating potential solution alternatives.

1. Defining the problem too narrowly.
2. Attacking the symptoms and not the real problem.
3. Assuming there is only one right answer.
4. Getting "hooked" on an early solution alternative.
5. Getting "hooked" on a solution that almost works (but really doesn't).
6. Being distracted by irrelevant information (mental dazzle).
7. Getting frustrated by lack of success.
8. Being too anxious to finish.
9. Defining the problem ambiguously.

There is a direct correlation between the time people spend "playing" with a problem and the diversity of the solutions generated.

Sometimes problem solvers will not cross a perceived imaginary limit – some constraint formed in the mind of the solver---that does not exist in the problem statement.

Draw a continuous polygonal line that passes through each circle exactly once – and use the fewest number of line segments you can manage:
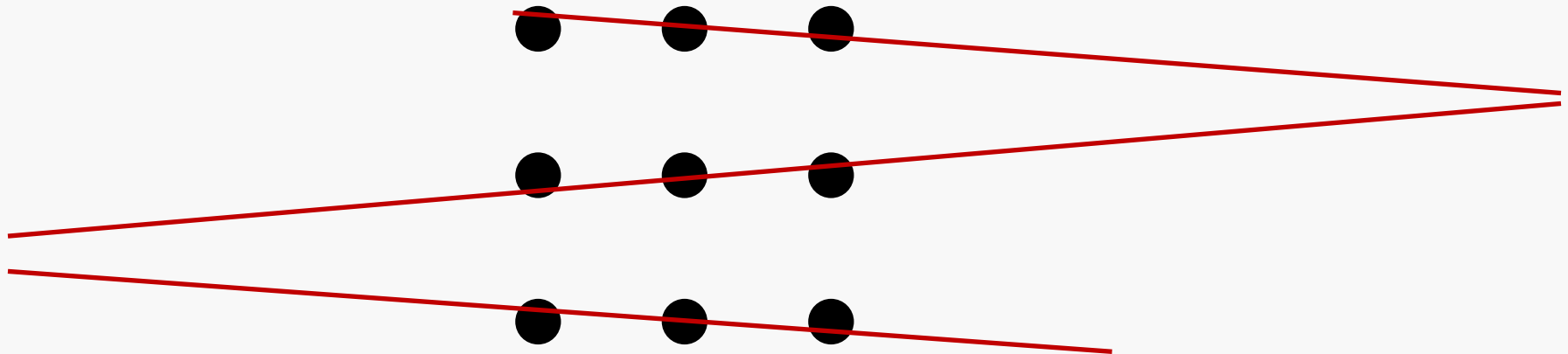
1. Stereotyping: functional fixedness (einstellung).

2. Limiting the problem unnecessarily.

3. Saturation or information overload.

4. Fear of risk taking.

5. Lack of appetite for chaos.

6. Judging rather than generating ideas.

7. Lack of challenge.

8. Inability to incubate.

Sources of blocks: culture, taboos, environment, inability to express, inflexible/inadequate problem solving skills.

1.   Negative Attitude: Attitude Adjustment

–   List positives, focus on opportunity instead of risk.

2.   Fear of Failure: Risk Taking

–   Define the risks and how to deal with them.

3.   Following Rules: Breaking Rules

–   Try new things, new foods, new places.

4.   Overreliance on Logic: Internal Creative Climate

–   Let imagination work, play with it.

5.   Believing Not Creative: Creative Belief

–   Ask "what if," daydream, make analogies.

Keep track of ideas (write them down immediately).

Pose new questions to yourself every day.

Keep abreast of your field.

Learn about things outside your specialty.

Avoid rigid, set patterns of doing things.

Be open and receptive to new ideas.

Be alert in your observations.

Adopt a risk-taking attitude.

Keep your sense of humor.

Engage in creative hobbies.

Have courage and self confidence.

Learn to know and understand yourself.

Brainstorming

Futuring

Analogy and Cross-fertilization

Free Association Phase

    Unstructured.

    Generate lots of ideas.

    Ideas flow freely for awhile, then taper off.

    How to generate more ideas?

Vertical Thinking

Lateral Thinking

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A more structured approach to generating new ideas as part of brainstorming.

- Adapt: How can we use this?

- Modify: What changes can we make?

- Magnify: Add something? Make stronger, longer, etc.?

- Contract: Split up? Lighten?

- Rearrange: Interchange, reorganize?

- Combine: Compromise? Blend?

Random Stimulation

- Select a word from the dictionary or a list of "stimulating" words.

Other People's Views (OPV)

- Imagine yourself in other roles.

Ask leading/stimulating questions, ignore technical feasibility (aka wishful thinking).

- What are the characteristics of an ideal solution?

- What currently existing problem, if solved, would make our lives/jobs easier, or make a difference?

Cheese/yogurt factory generates acidic waste byproducts. Traditional approach is to "treat" the waste so that it can be discharged.

Futuring: Imagine a successful plant with no waste. All such "waste" has a useful purpose.

- Protein: Food additives/supplements.
- Sugar: Ferment for Ethanol.
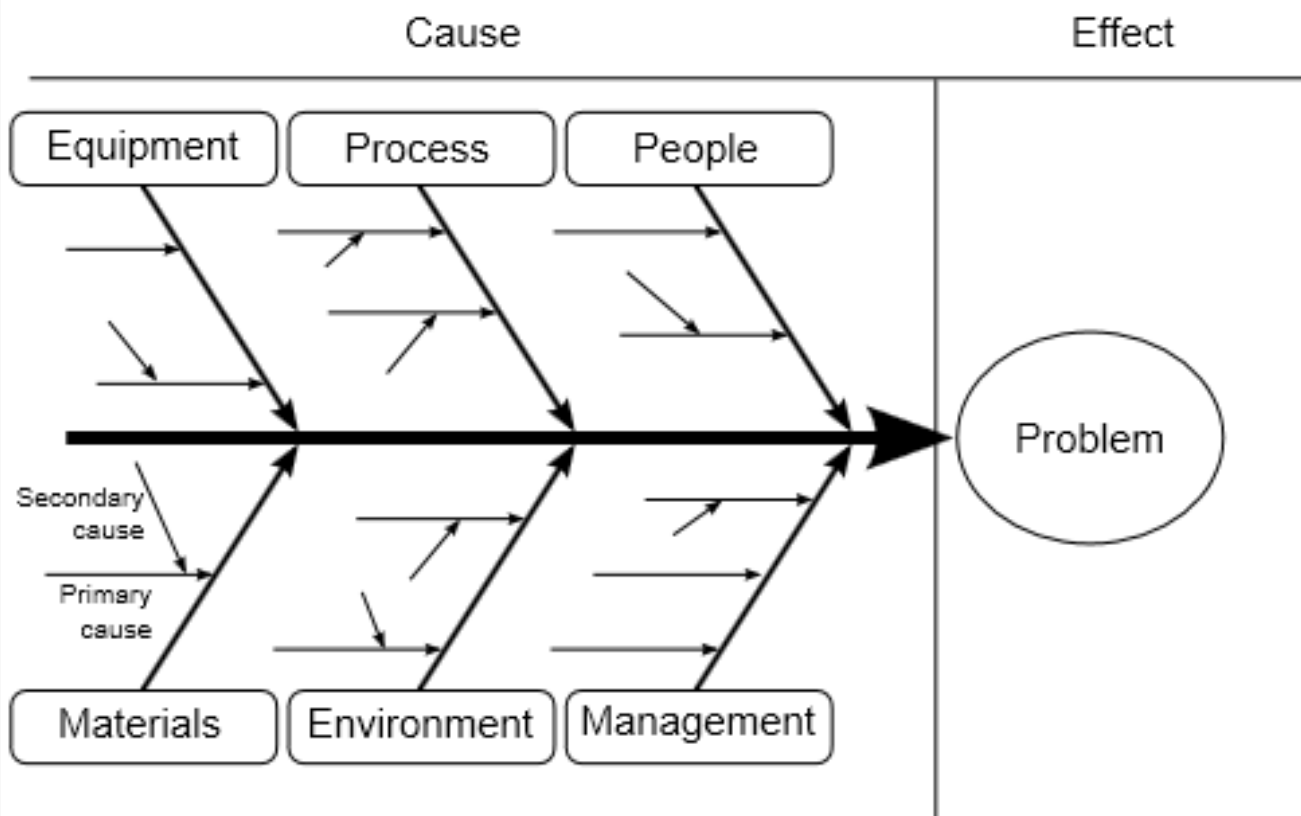- Solid waste: De-icing compound, construction material.

Real problem: What to do with waste?

Used to organize and record brainstorming session.

Backbone is the problem to solve.

Categorize solutions. Each is a diagonal spur.

List the solutions on each spur, perhaps generate subspurs.

Painting

- Let kids paint graffiti on cars.
- Paint targets and throw balls at them.
- Paint as something (wagon) for play.

Whole Car

- Make teeter-totter (upside down).
- Turn into a go-cart.
- Let kids drive it.

Parts

- Use seats as swings.

1.   State the problem.

2.   Generate analogies (the problem is like...).

3.   Solve the analogy.

4.   Transfer solution to problem.

Much of science is done by combining ideas from different fields.

Imagine a meeting between pairs such as:

- beautician and college professor,
- police officer and software programmer,
- automobile mechanic and insurance salesman,
- banker and gardener,
- choreographer and air traffic controller,
- maître d' and pastor.