What Is Creativity?

- Definition: new and useful ideas
- A process
  - problem presentation
  - preparation
  - generation of ideas
  - recognition/evaluation
  - preservation/reproduction
- “Front end” of innovation (implementation)
Resources For Creativity

- Expertise
domain-relevant skills, knowledge, talents

- Creativity Skills
playfulness, breaking set, independence, tolerance for ambiguity, questioning attitude, novelty-seeking, analogies and connections, model building, concentration

- Task motivation
intrinsic, self-efficacy
Personality and Environment

- In *Born to Rebel*, Sulloway shows that first-born eminent scientists tend to identify with authority and produce incremental advances, whereas later-born scientists are more likely to “break out” with revolutionary ideas.
- This “personality” is not inborn but is developed in the family as children find successful “niches” and carry that pattern later in life.
- Einstein: “This coercion (in a militaristic classroom) had such a deterring effect upon me that, after I had passed the final examination, I found the consideration of any scientific problems distasteful for an entire year.”
How To Destroy Creativity

- always pretend to know more than anybody else
- police your employees by every procedural means
- have your professionally-trained staff members do technicians’ work for long periods of time
- erect the highest possible barrier between commercial decision-makers and your technical staff
- don’t speak to employees on a personal level, except when announcing raises
- be the exclusive spokesman for everything for which you are responsible
- say yes to new ideas, but do nothing about them
- call many meetings
- put every new idea through channels
- worry about the budget
- cultivate the not-invented-here syndrome
Individual Conceptual Blocks

- self-imposed constraints
  e.g., Pepsi fights the Coke bottle, nine-dot problem
- cultural values
  e.g., ping pong ball problem
- improper symbolic representation
  e.g., algebra-word problems
Nine Dot Puzzle

- Draw four straight lines that pass through all nine dots without lifting your pen
- If you get it, try three connected straight lines
Pepsi Fights The Coke Bottle

- 1950s hourglass bottle is Coke’s “most important competitive advantage”
- 1958 Pepsi swirl bottle weakly imitates Coke’s bottle
- 1970s John Scully, Pepsi’s V-P Mkt: “How should problems such as this be approached?”
- Shift the ground rules: what do customers really want?
How To Get The Ball Out?

- Get the ping pong ball out without damaging the ball, tube, or floor
- You have scissors, nails, thread, book, walkman radio, glasses, hammer, stick
Algebra Word Problems

- Bob has three times as many pine cones as Dan. Between them they have 28 pine cones. How many does each have?
- If it takes 1 woman 9 months to have 1 baby, how many babies can 3 women have in 3 months?
- A hobo can make 1 whole cigar from every 5 cigar butts he finds. How many cigars can he make if he finds 25 cigar butts?
Some Creativity Techniques

- Brainstorming: generate ideas uncritically
- Synectics: use analogies (e.g., biological) to join unrelated elements
- Systematic combinations and cross-impacts of elements
### Generating Scientific Objectives For A NASA Space Program

<table>
<thead>
<tr>
<th>Action Phrase</th>
<th>Target Feature</th>
<th>Target Object</th>
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<tbody>
<tr>
<td>Observe circulation in</td>
<td>photosphere of</td>
<td>the sun</td>
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<tr>
<td>Measure tidal deformations of</td>
<td>surface of</td>
<td>the moon</td>
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<td>Establish the structure of</td>
<td>interior of</td>
<td>Jupiter</td>
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<td>Measure relativistic time</td>
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<td>the space environment</td>
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<td>dilations in</td>
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Organizations and Innovation

- **Management practices**: freedom, challenging work, supervisory encouragement, work group support
- **Organizational resources**: workload, networks
- **Organizational motivation**: oriented to being industry leaders, finding new ways/products
What techniques are used to encourage creativity?

How does this particular situation “rate” on Amabile’s three creativity resources?

- expertise
- creativity skills
- task motivation