

THE ICE CREAM GAME:

An interactive Systems Thinking
Activity to teach the principles of
ecological & social dynamics at
Public Participation workshops



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Introduction:

Social, political, and environmental problems are becoming more and more complex; making understanding such issues increasingly perplexing for the average community member...



Introduction:



Systems thinking can offer insights and approaches for tackling complex problems.



Introduction:



A system is an entity that maintains its existence and functions as a whole through the interaction of its parts.



Systems Thinking:



Requires a shift in the way we think.

We move away from looking at isolated events, and start to look at the system of interacting parts.



Systems Thinking:

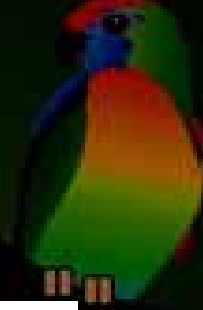
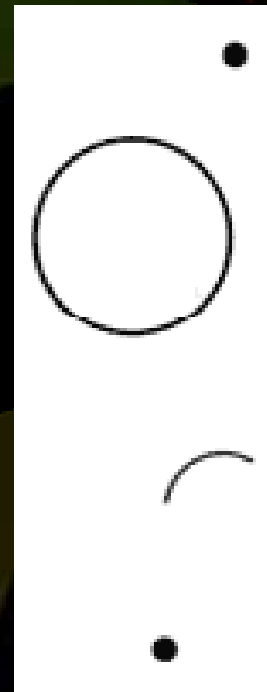
Systems Thinking is a way of learning by looking at *connected wholes* rather than *separate parts*.

Systems Thinking Incorporates:



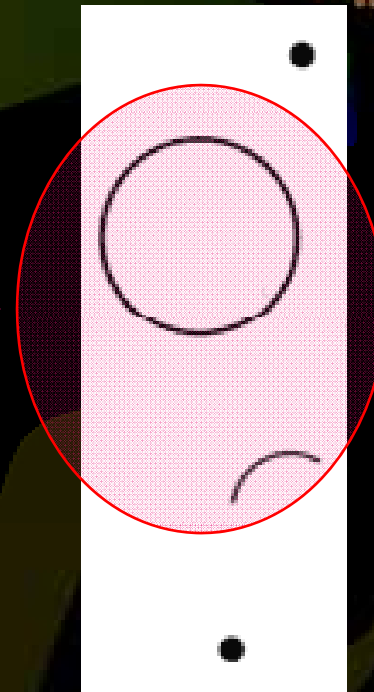
This iterative journey leads to understanding!

Consider these
parts
of a system.

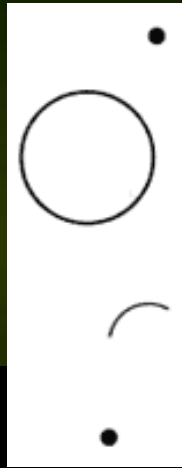


Perspective: I don't like dots!

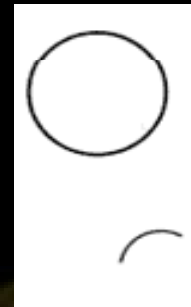
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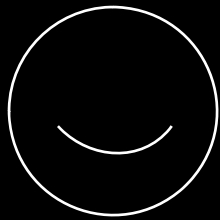
So...I establish *Boundaries*...



Perspective



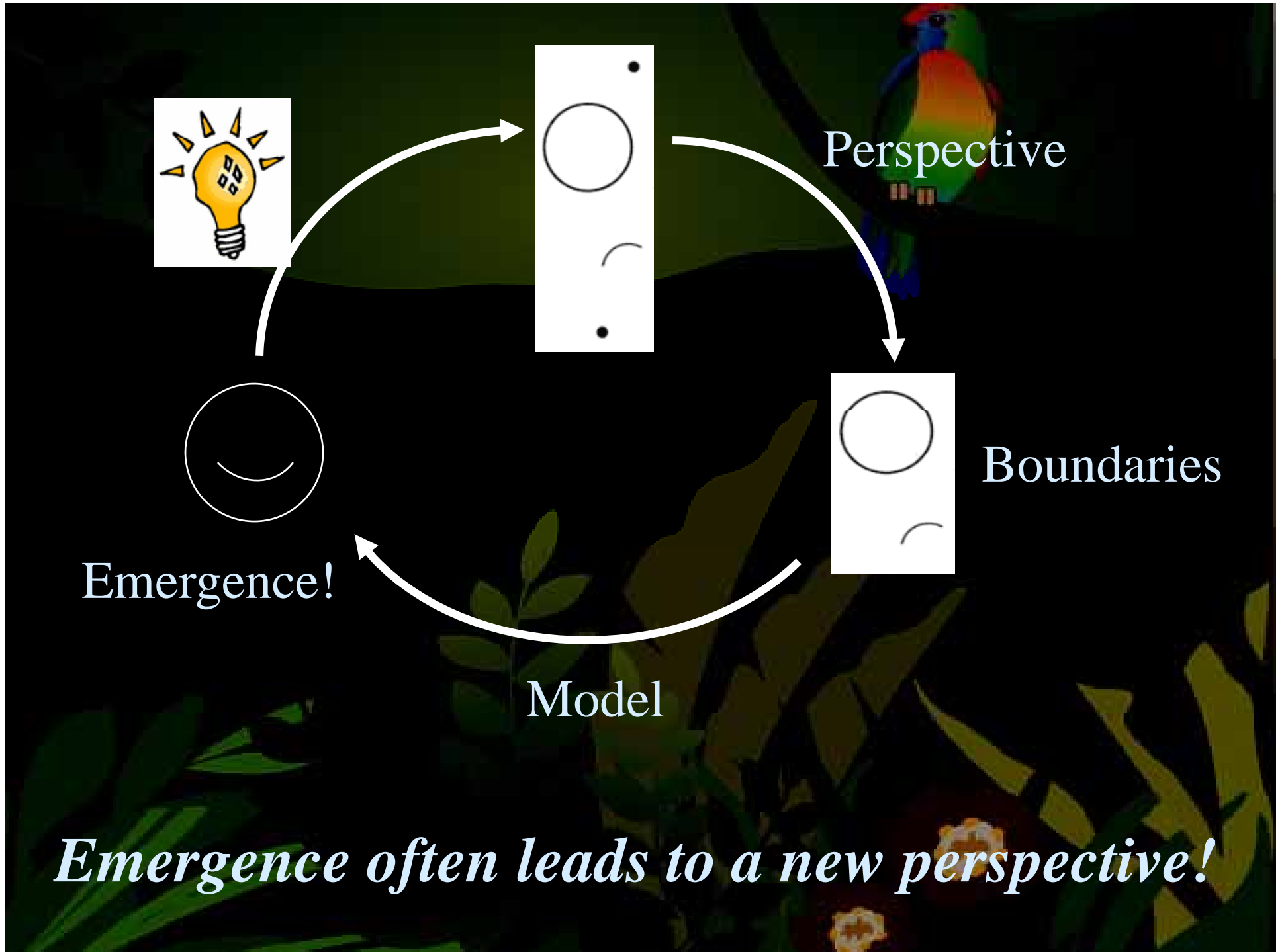
Boundaries



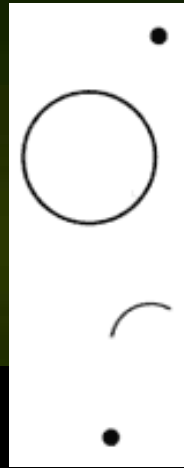
Emergence!

Model

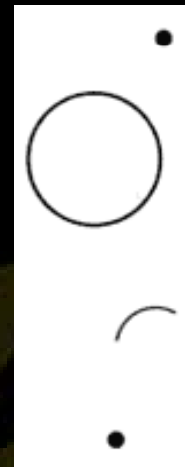
Emergence often leads to a new perspective!



Understanding!

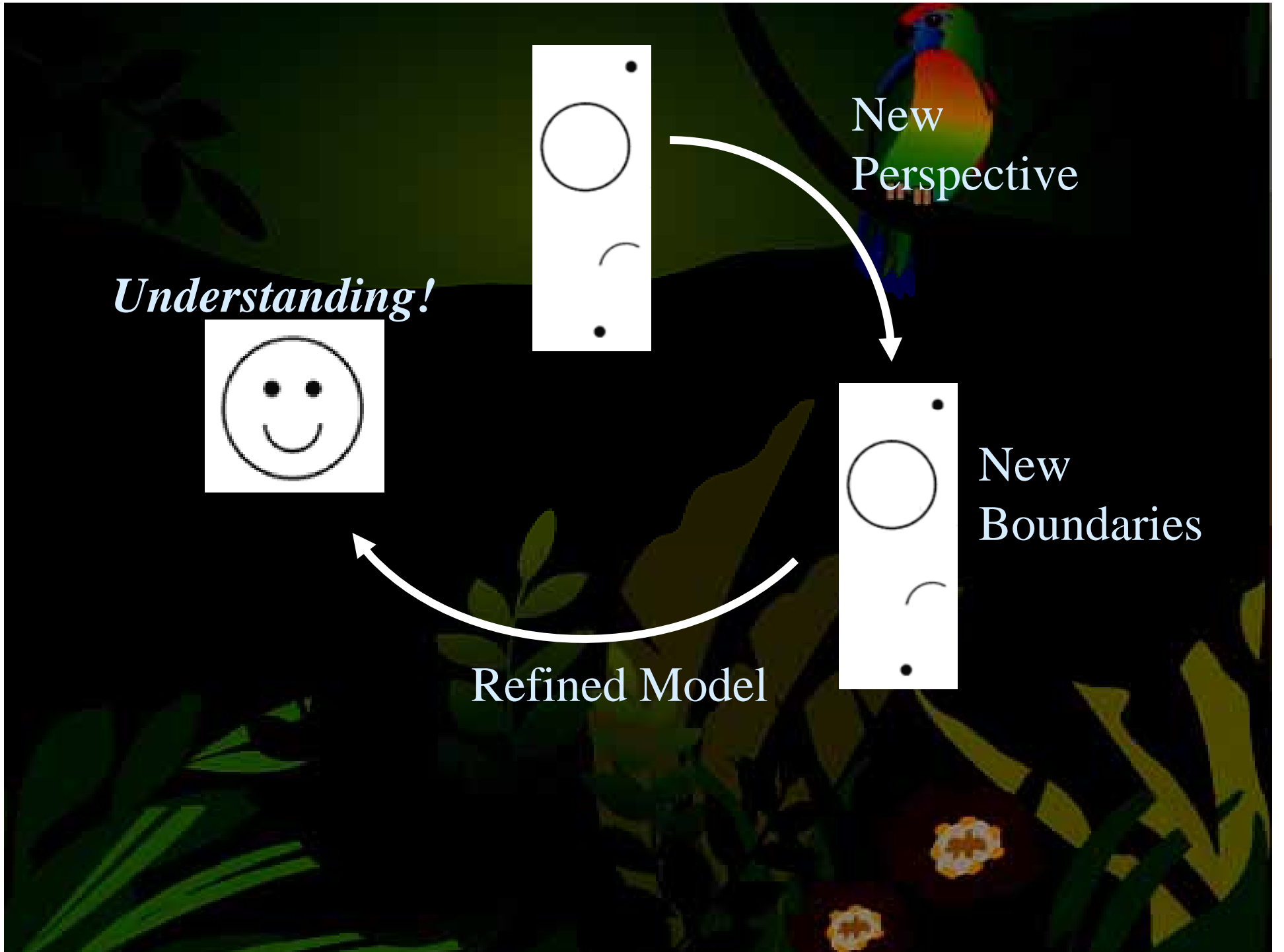


New
Perspective



New
Boundaries

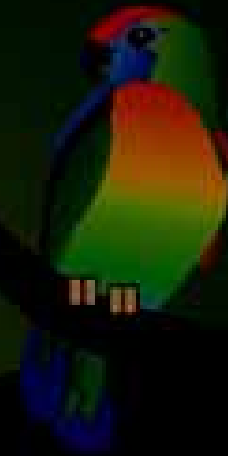
Refined Model





Systems are:

Comprised of many elements,
operating according to a wide
range of incentives, goals, and
decision making rules





Systems are:

Characterized by the self-organization of their own structures





Systems are:

Defined by feedback loops and signals so they can not be usefully reduced to more simple components





Systems are:

Have outcomes that are *Emergent*
Exhibiting unimagined sensitivity
to change





Stability & Change in Systems:

- With Stability comes Resistance
- Leverage - Systems can suddenly change if you find just the right combination of actions
- Side Effects - a change in one part of the system may “ripple” into another aspect of the system



Stability & Change in Systems:

“Often the most critical point for leverage in any system is the beliefs of the people in it, because it is the beliefs that sustain the system as it is...”

(O'Connor & McDermott, 1997 p. 25)



Time Delays:


- Change in a complex system is not usually immediate
- Feedback takes time to travel through the system
- We must take time delays into account when we evaluate the success of our strategies - it takes time for the full consequences to be observed





Systems Thinking as a Tool for Problem Solving:

1. Multiple perspectives
2. Multiple boundaries - physical, political, & social
3. Shared systems thinking efforts bring shared understandings of the larger picture.
4. Better policy & action ideas emerge

A colorful parrot with green, blue, and red feathers is perched on a dark branch in the upper right corner. The background is a dark, textured green with faint silhouettes of leaves and flowers, creating a forest-like atmosphere.

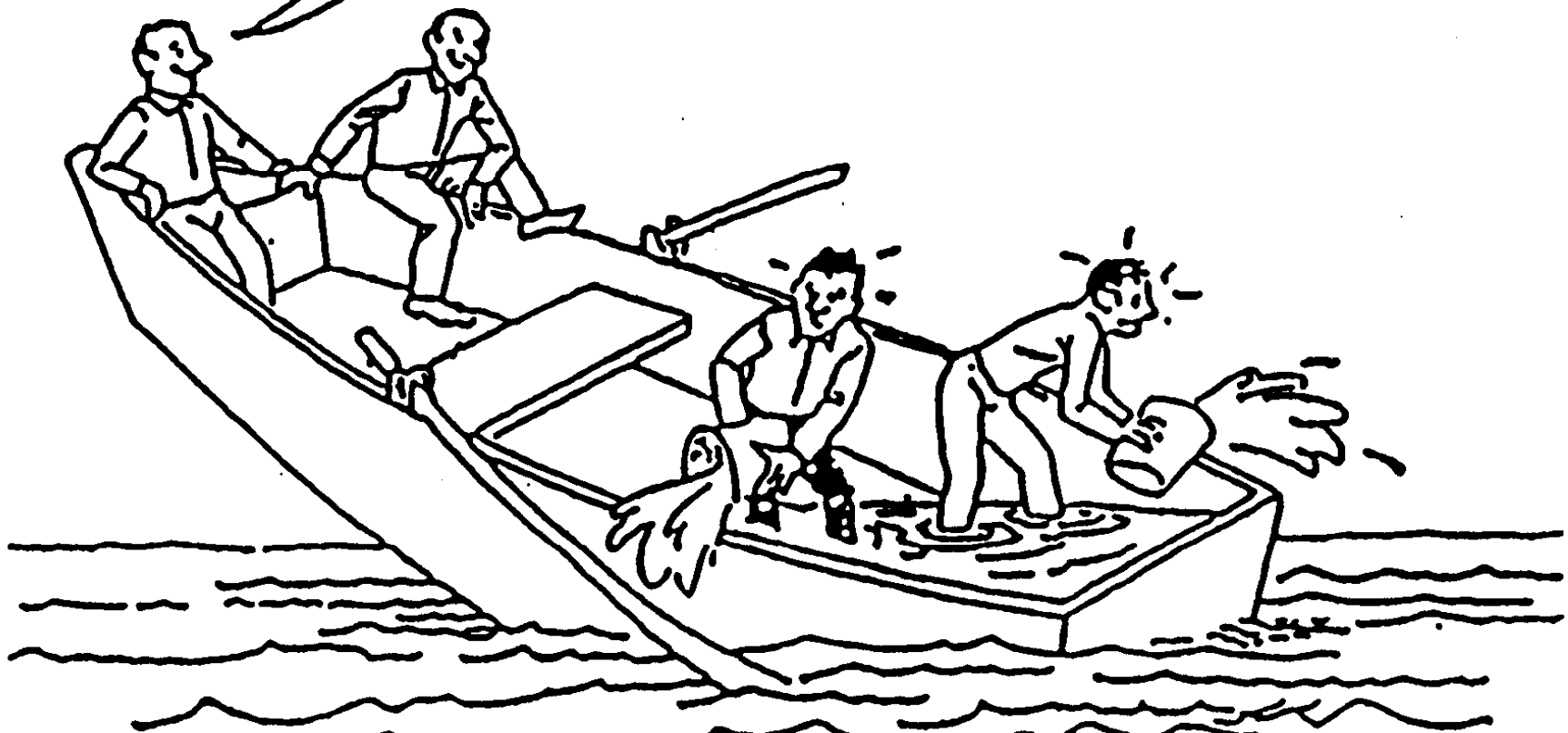
Systems Thinking when addressing issues of environmental complexity:

- Encourages perspective sharing
- Encourages perspective-taking
- Facilitates problem solving efforts
- Improves our understanding of the complex, scientific and political properties of the situation.

NOT Systems Thinking!



I'm sure glad the hole isn't in our end . . .





Introduction:

The National Science Foundation sponsored a research project that included public outreach workshop series based on systems thinking and collaborative model building to help local stakeholders understand the complexity of climate change in the Salt Lake Valley.

The workshop participants played a systems thinking game called "The Ice Cream Game." They also worked in groups to develop a computer generated systems model of local air quality dynamics.



The Purpose of The Ice Cream Game

1. Introduce the key principle: “system structures and behaviors are interrelated.”
2. Experience the challenges of playing a role in a system.
3. Identify generic system concepts and how they translate into the local environmental system - such as climate change or a carbon sequestration system.

Time Issues



Daily Operations

**15 Day Period
at Start of Season**

**2-Day Delay for Factory
to Respond to Orders**

Game Roles

- **10 Roles to be covered – details on game board**
 - *Store Money Manager*
 - *Store Stock Manager*
 - *Store Overhead Collection & Observer*
 - *Factory Production Manager*
 - *Factory Stock Manager*
 - *Factory Sales Manager*
 - *Factory Overhead Collection & Observer*
 - *Delivery Person*
 - *Customer(s) Money Manager*
 - *Weather Person & Observer*
- **Sometimes 2 roles can be covered by one person**
- **Some roles can be shared with more than one person**



Workshop Participants' Responses to "The Ice Cream Game"

- "Normally when I hear the word game, I leave, quickly. I'm glad I stayed." (SLC/7-16-04/001)
- "[I learned] the importance of systems thinking vs linear thinking. How important communication is to promoting efficiency of the system..." (SLC/7-16-04/002)
- "[I felt] dependence on other institutions' follow through for support at critical times." (SLC/7-16-04/005)
- "Most decisions are made with incomplete information. Decision makers only see a small piece of the total picture" (SLC/7-16-04/014)
- "People's frustrations mirrored those we have to deal with when dealing with complex systems such as air quality." (SLC/7-16-04/019).

*I'm sure glad the
hole isn't in our end . . .*

