

Introduction to Systems Thinking for Early Childhood Leaders

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Systems Thinking in Schools

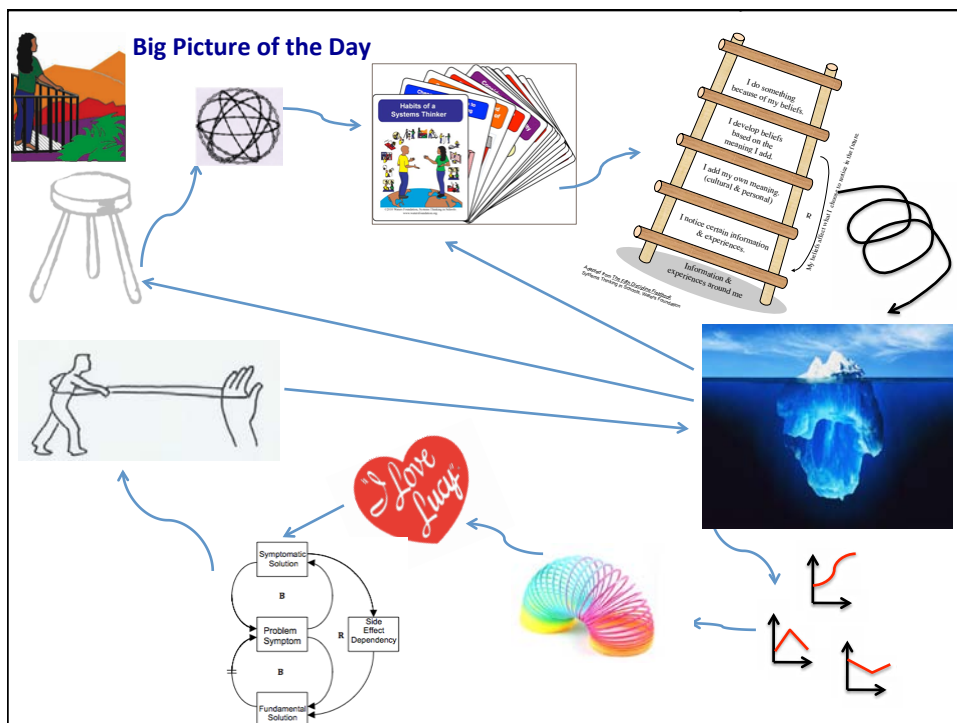
A WATERS FOUNDATION PROJECT

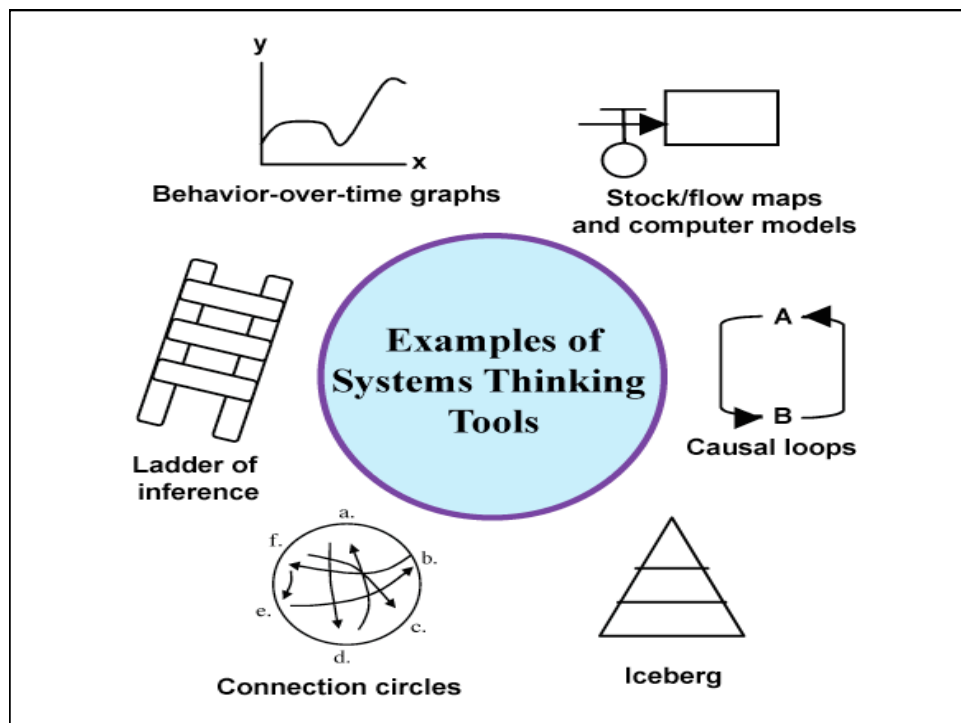
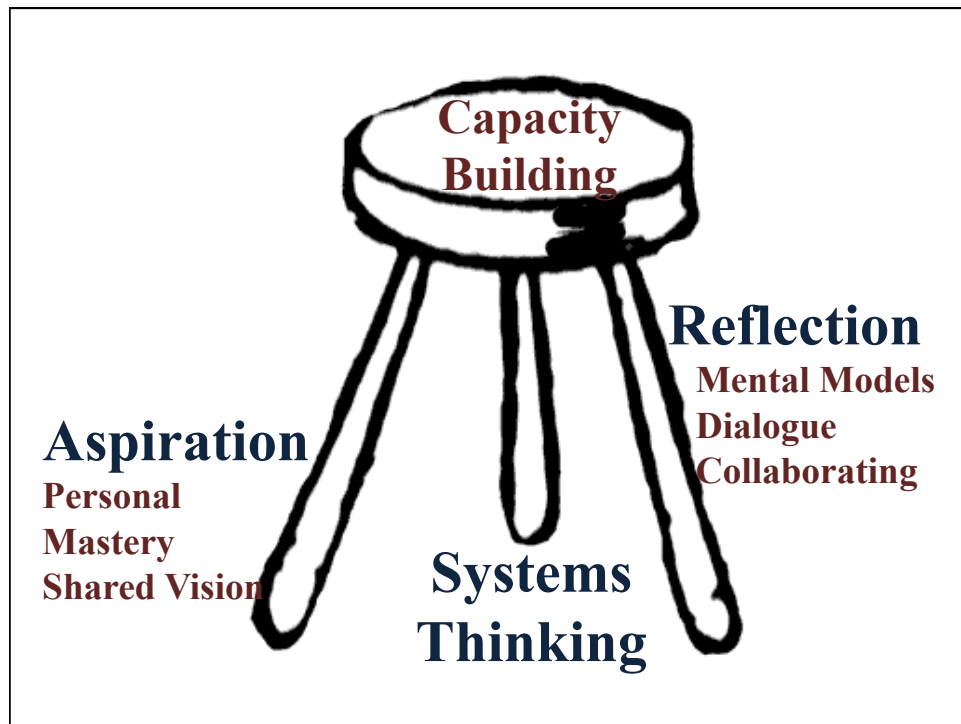
www.watersfoundation.org

Today's Learning Goals



1. You will be able to identify ways ST habits and tools can **positively influence your leadership development and impact program development.**
2. You will be able to identify ways ST habits and tools apply to your **job-embedded projects and the roles you play as state level leaders.**
3. You will leave the day with concrete ways the new tools and strategies can be applied to your **leadership work.**





Characteristics of Complex Systems

- Boundaries
- Parts or Elements
- Interdependencies (Relationships)
- Goal or Purpose
- Dynamics

Mental Models

Mental models are deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action.

Peter Senge, *The Fifth Discipline*, 1990



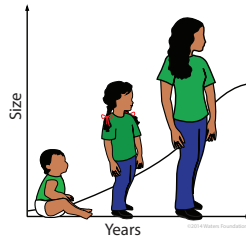


Based on your understanding of complex systems, what are some of the biggest challenges you face as a leader?

Seeks to understand the big picture



Observes how elements within systems change over time, generating patterns and trends



Recognizes that a system's structure generates its behavior



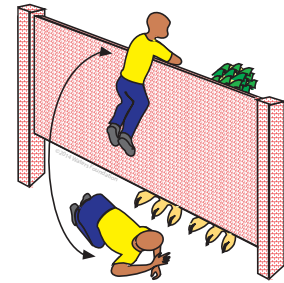
Identifies the circular nature of complex cause and effect relationships



Makes meaningful connections within and between systems



Changes perspectives to increase understanding



Surfaces and tests assumptions



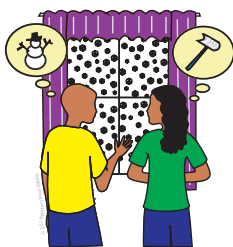
Habits of a Systems Thinker



Considers an issue fully and resists the urge to come to a quick conclusion



Considers how mental models affect current reality and the future



Uses understanding of system structure to identify possible leverage actions



Considers short-term, long-term and unintended consequences of actions



Pays attention to accumulations and their rates of change



Recognizes the impact of time delays when exploring cause and effect relationships



Checks results and changes actions if needed: "successive approximation"

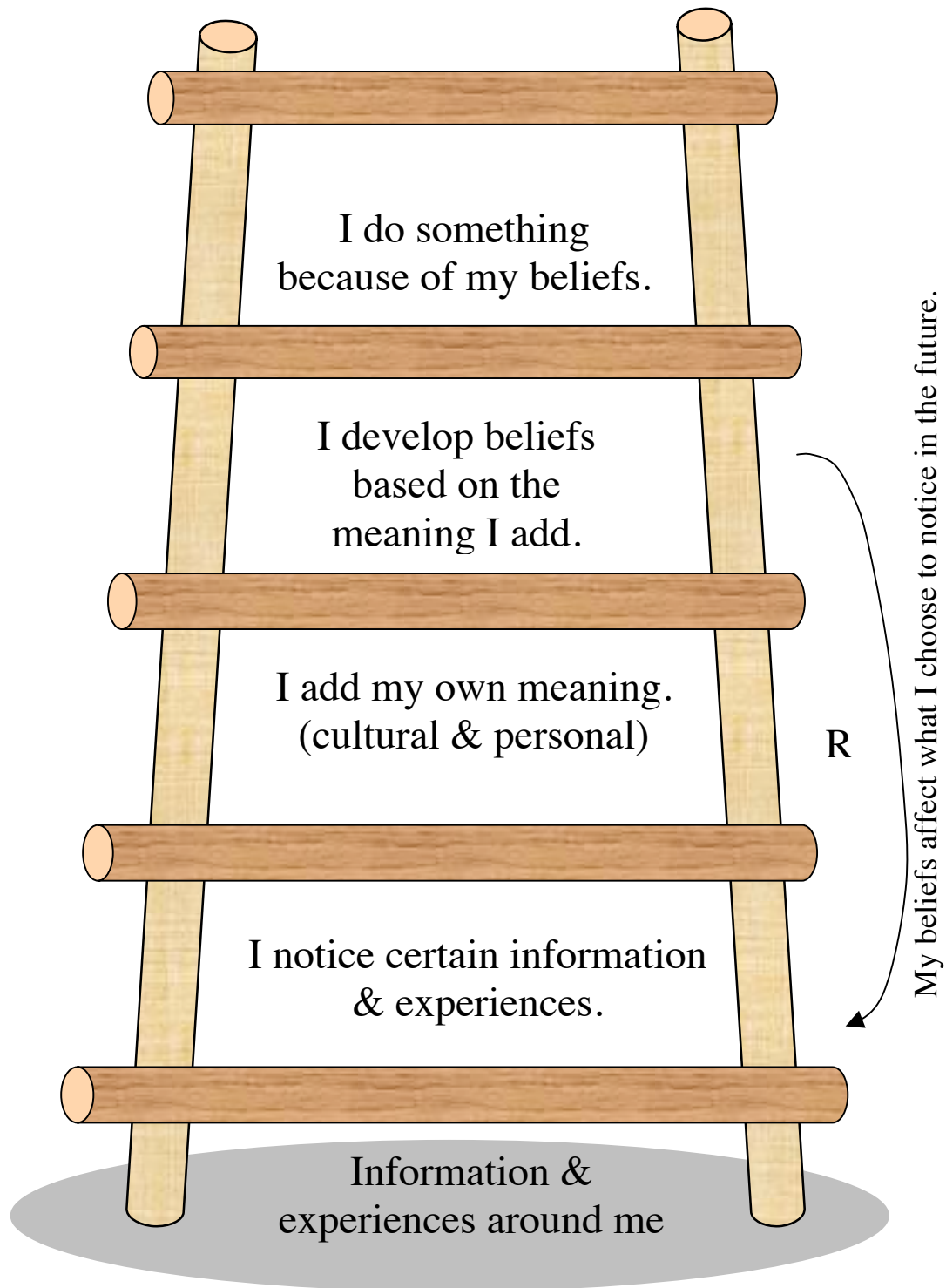




What connections can you make between the Habits of a Systems Thinker and your experience with Adaptive and Reflective Leadership?

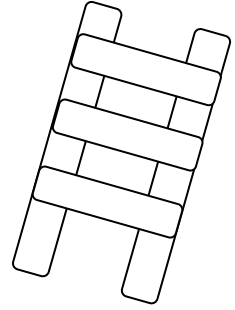
Which Habits are especially important to your early childhood leadership work?

Ladder of Inference



Adapted from *The Fifth Discipline Fieldbook*
Systems Thinking in Schools, Waters Foundation

Practices that help you use The Ladder of Inference



- **Reflection**
 - Suspend judgment
 - Become more aware of your own thinking and broaden your observations

- **Inquiry**
 - Inquire into other's thinking and reasoning
 - Ask open-ended questions that seek clarification

- **Advocacy**
 - Make your thinking and reasoning more visible to others by describing what influenced your thinking and your actions

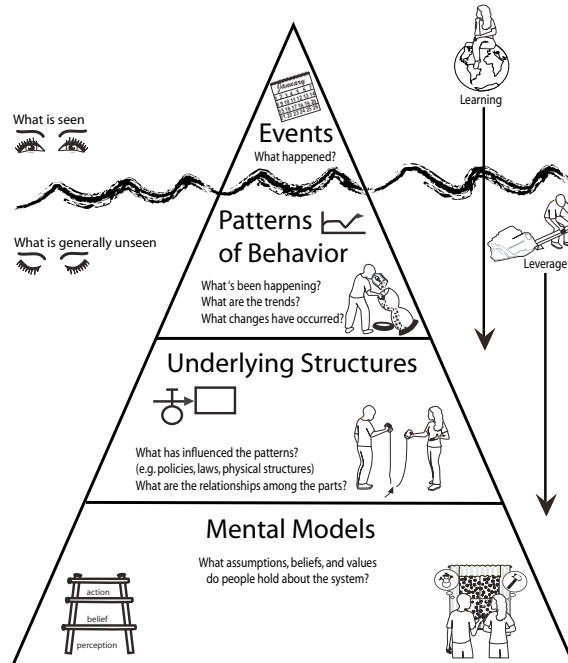
Notes:

The Big Picture

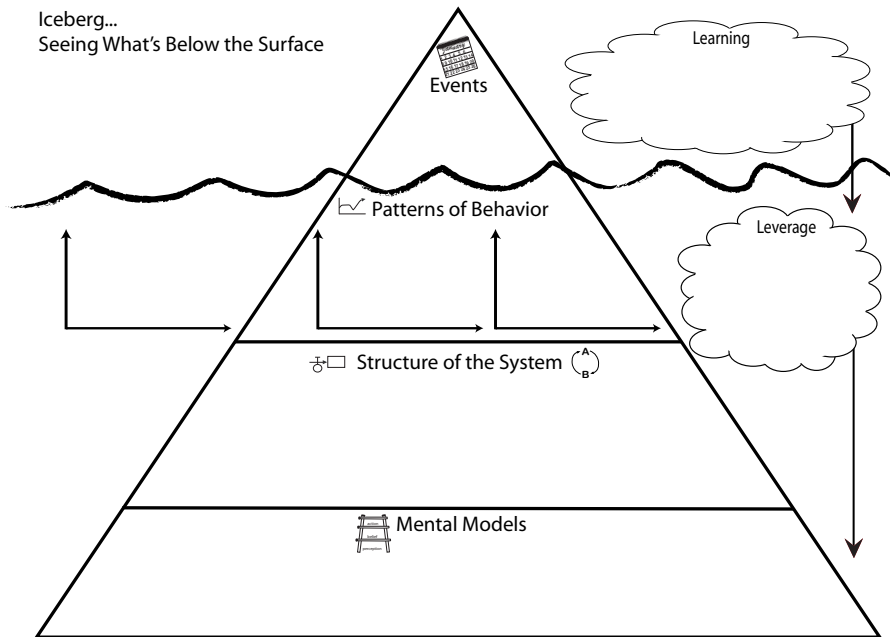
Seeks to understand the "big picture"



Iceberg... Seeing What's Below the Surface



Iceberg... Seeing What's Below the Surface



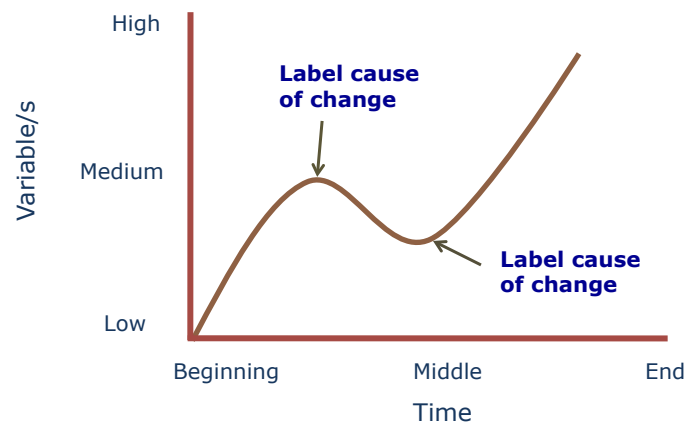
Adapted by Systems Thinking in Schools, Waters Foundation, www.watersfoundation.org from Innovation Associates, Inc.



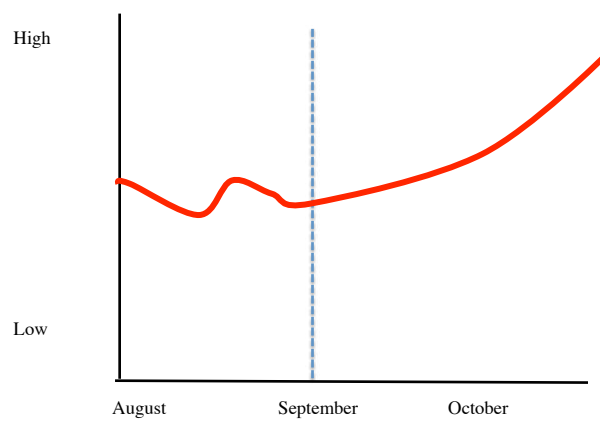
What are some mental models you may be holding (about the system, about others) that may be barriers to achieving your desired outcomes?



BOTG Basics



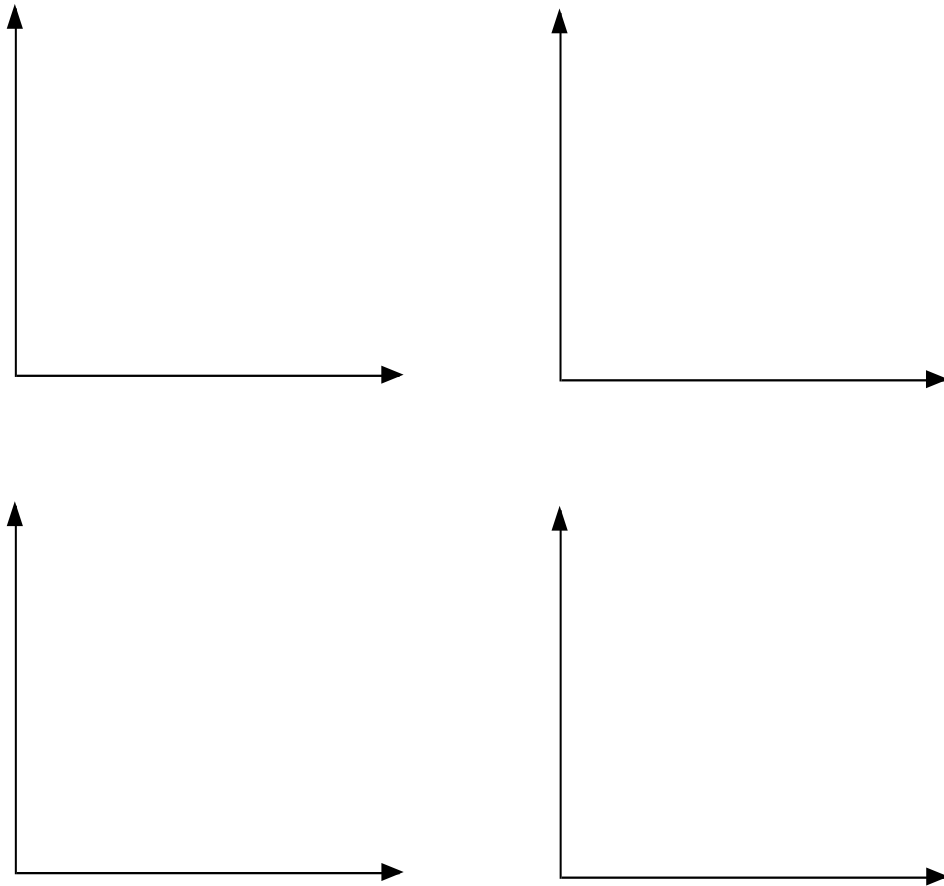
Using BOTGs to identify current and desired trends



Behavior-Over-Time Graphs:

What is changing over time?

How are the essential elements changing?



Some sample questions to ask when identifying parts of a system that change over time:

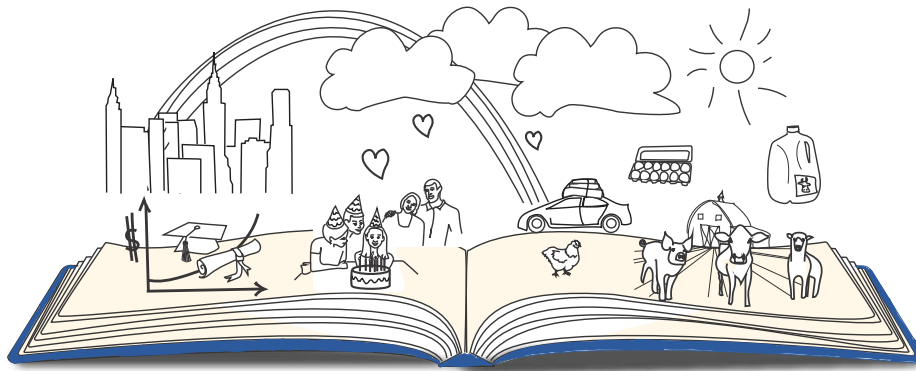
- What important elements have changed over time?
- How has _____ changed over time?
- During what period of time have the changes occurred?
- Where on the y-axis should the graph start and why?
- How would you label the bottom/middle/top of the y-axis?
- What evidence supports the graph being created?

Questions to consider once BOTGs have been created:

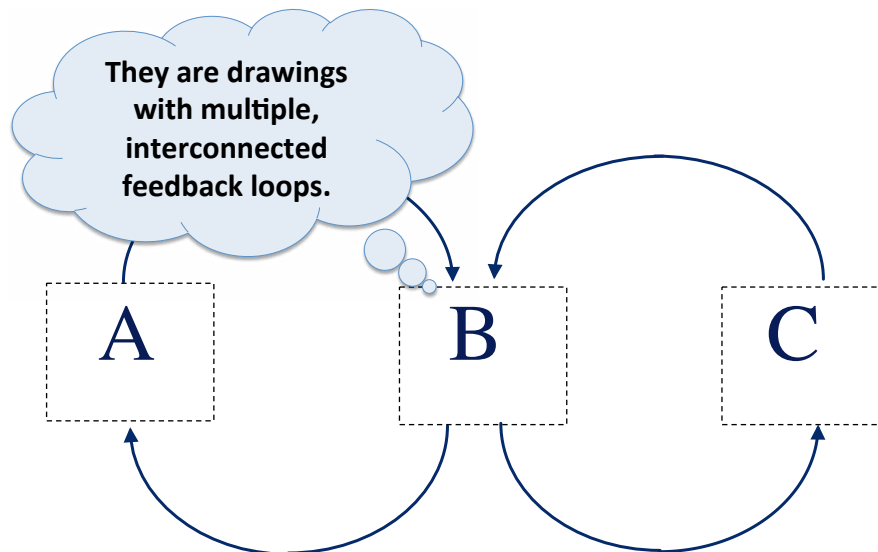
- What caused any changes in direction or slope?
- How are interpretations of a graphed element the same or different?
- What changes may happen in the future based on what has been happening?
- Do you see any connections (interdependencies or causal relationships) between/among graphs?

Causal Loop Archetypes

Archetypes capture “**common stories**” that occur repeatedly in diverse settings.



What do they look like?



Causal Loop Archetypes help you see and understand systems.

Archetypes are **lenses** or **perspectives** from which to see causal connections that create system behavior.

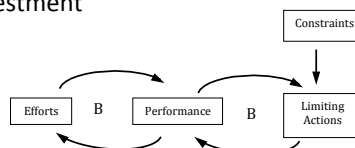
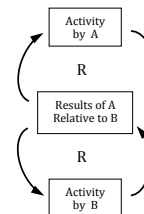
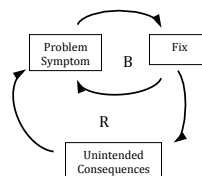
And, they help you anticipate possible problems before they occur.

Archetypes help you visually describe a complex situation or system.

Archetypes are **shorthand** for diagramming complex cause-effect relationships.

There are many archetype stories.

- **Fixes that Backfire**
- **Shifting the Burden**
- Drifting Goals
- Success to the Successful
- Escalation
- Accidental Adversaries
- Tragedy of the Commons
- Growth and Underinvestment
- Limits to Success
- Revolution
- Story Structure

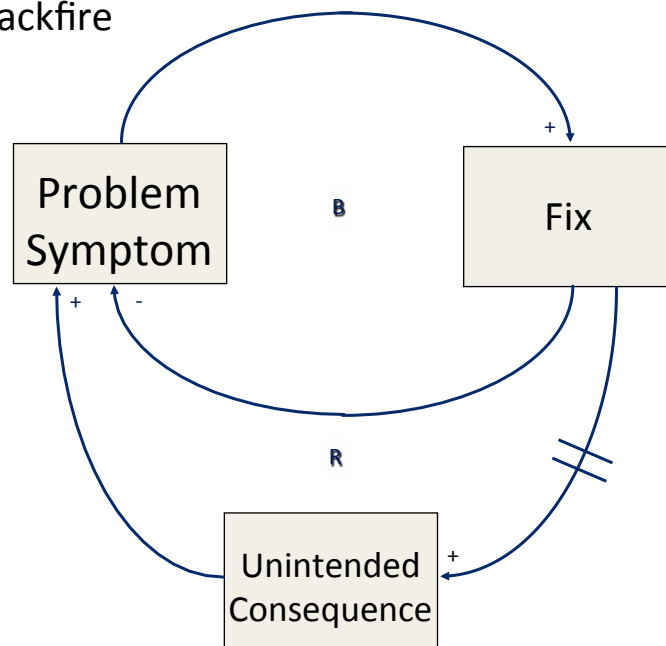


Fixes that Backfire Questions

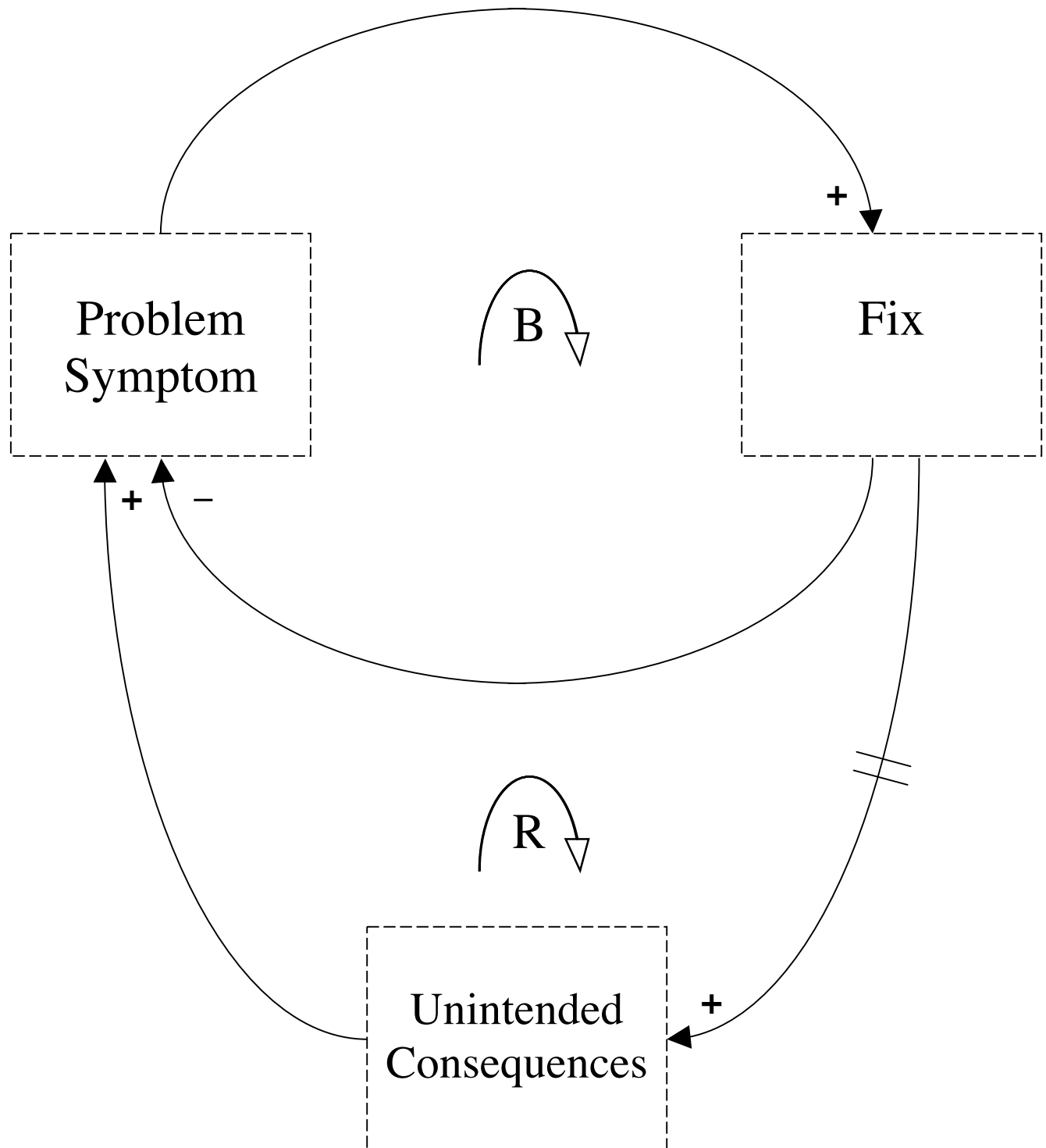
Has the need to respond quickly to a problem been greater than the importance of investigating potential unintended consequences?

Did the response help to reduce the problem in the beginning, but overtime, did consequences actually contribute to the original problem?

Fixes that Backfire



Fixes-that-Backfire

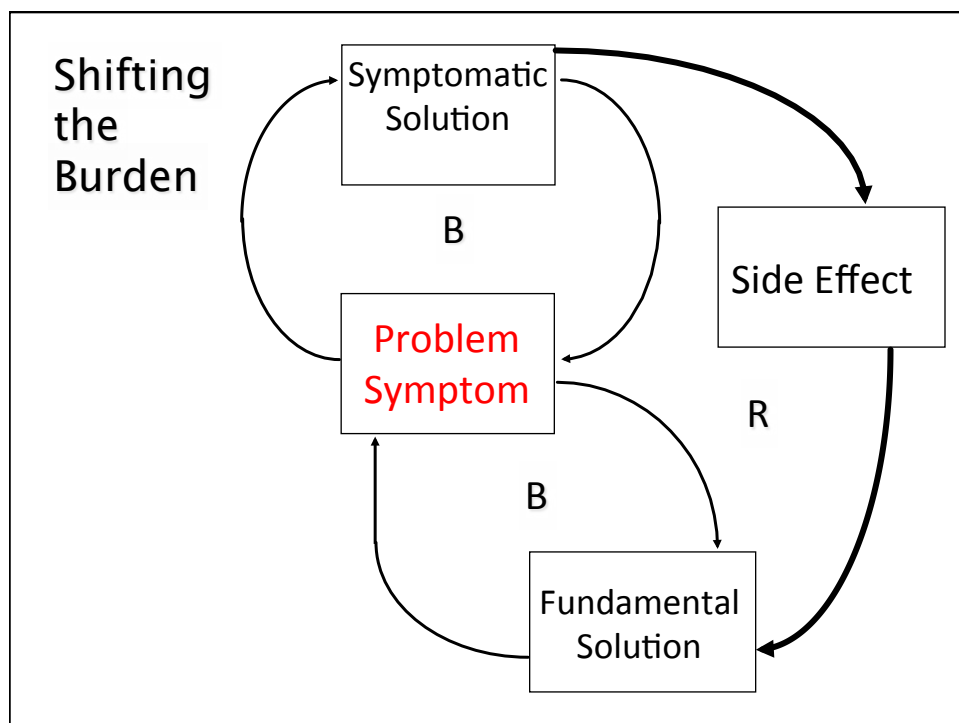


Shifting the Burden Questions

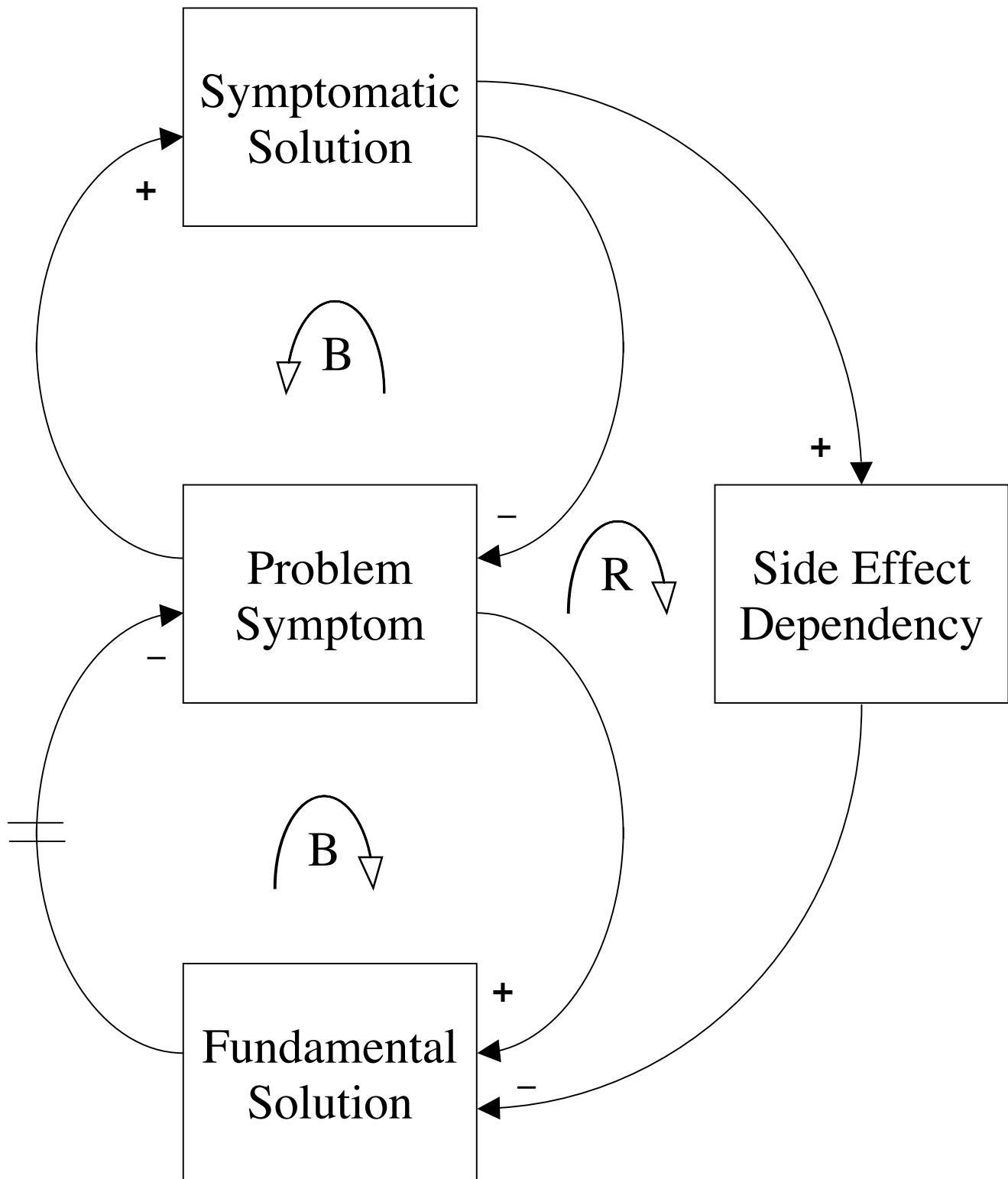
How can we address problems that continually pop up no matter what we do to try and solve them?

What happens when we develop dependencies on short-term, quick-fix solutions to problems?

How can we focus on more long-term fundamental solutions?



Shifting the Burden

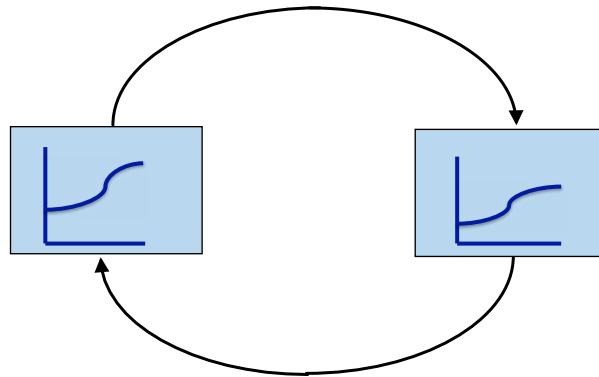


Handout by Waters Foundation, www.watersfoundation.org, based on archetype described in The Fifth Discipline, by Senge (1994) and by Innovation Associates, Inc.

Causal Loop Diagrams (CLDs) aka Feedback Loops



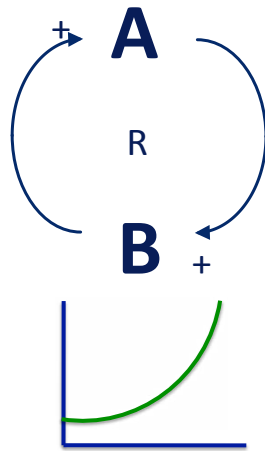
Feedback: As different parts of a system affect each other, causes become effects which in turn become causes.



Causal Loop Diagrams (CLDs) show circular causal relationships (feedback) within a system. CLDs can show “how” and “why” a system operates the way it does.

There are 2 types of feedback loops:
Reinforcing Loops and Balancing Loops.

Reinforcing Feedback



- “Things are getting out of control!”
- “I can’t keep up!”
- “We are really on a roll now!”
- “It’s spreading like wild fire!”

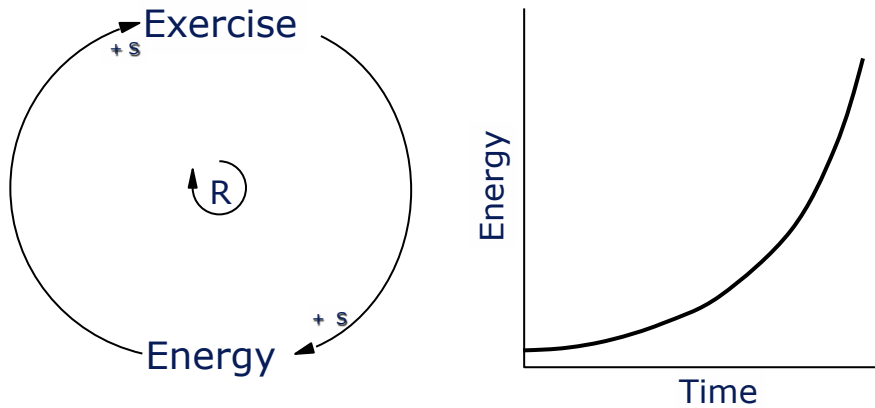
R-Reinforcing Loop
B-Balancing Loop
+/s – adds to or same direction
-/o – subtracts from or opposite direction

Reinforcing Feedback

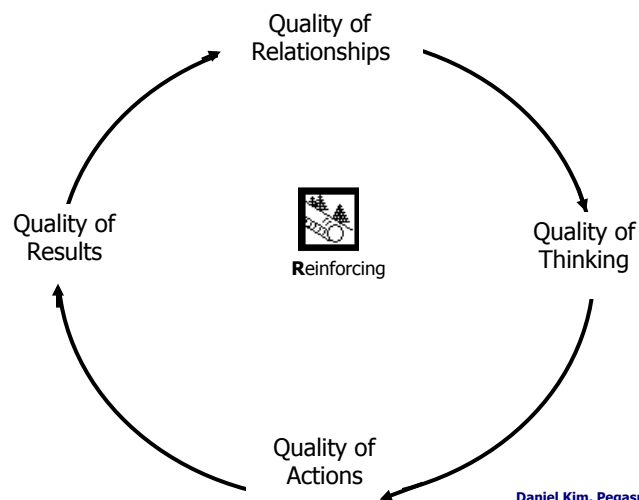
- Creates a reinforcing or compounding effect
- Examples of reinforcing feedback:
 - Rumors: “I told only one person, but soon everyone knew!”
 - Virus: “Only few had the virus at first, but soon it became an epidemic.”
 - Fads: “That fashion fad caught on quickly because soon everyone had to have it.”

Reinforcing Feedback

Causal Loop Diagram



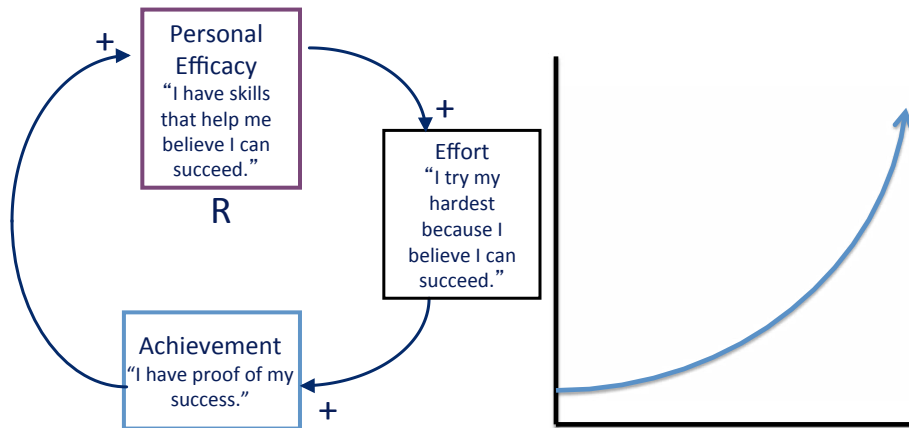
Core Theory of Success



Daniel Kim, Pegasus Communications

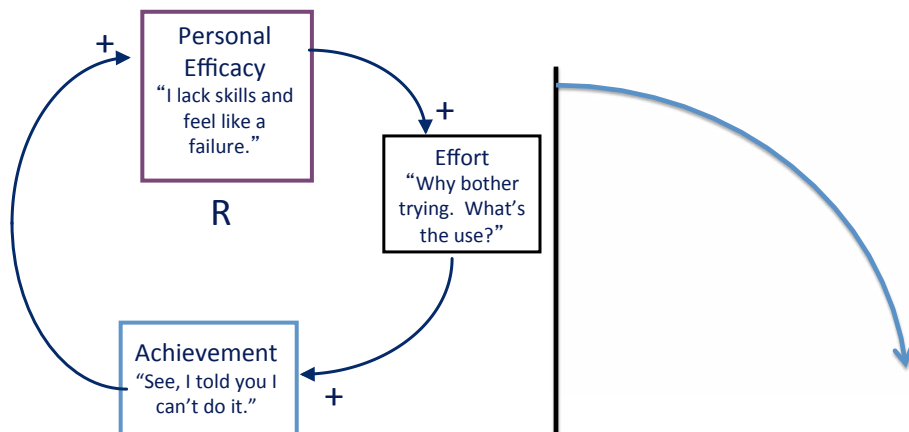
Reinforcing Feedback

Reinforcing Efficacy

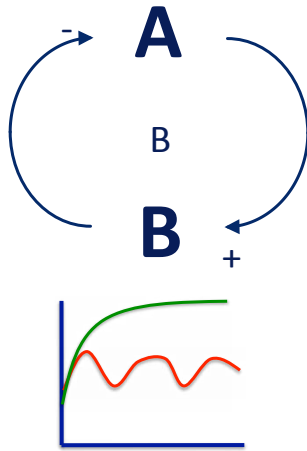


Reinforcing Feedback

Another look at reinforcing efficacy



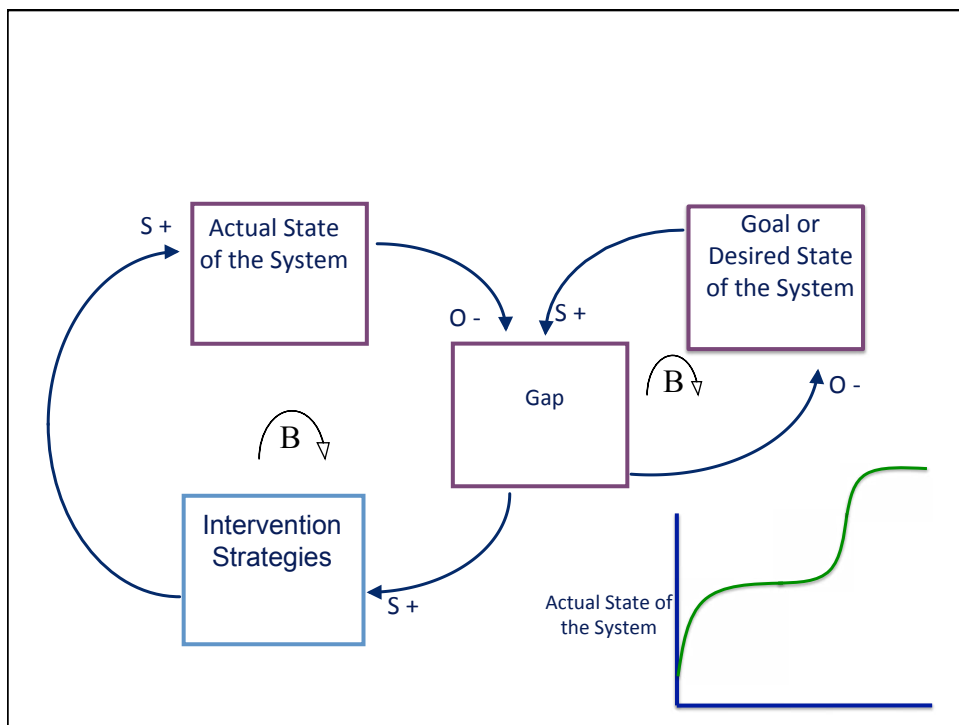
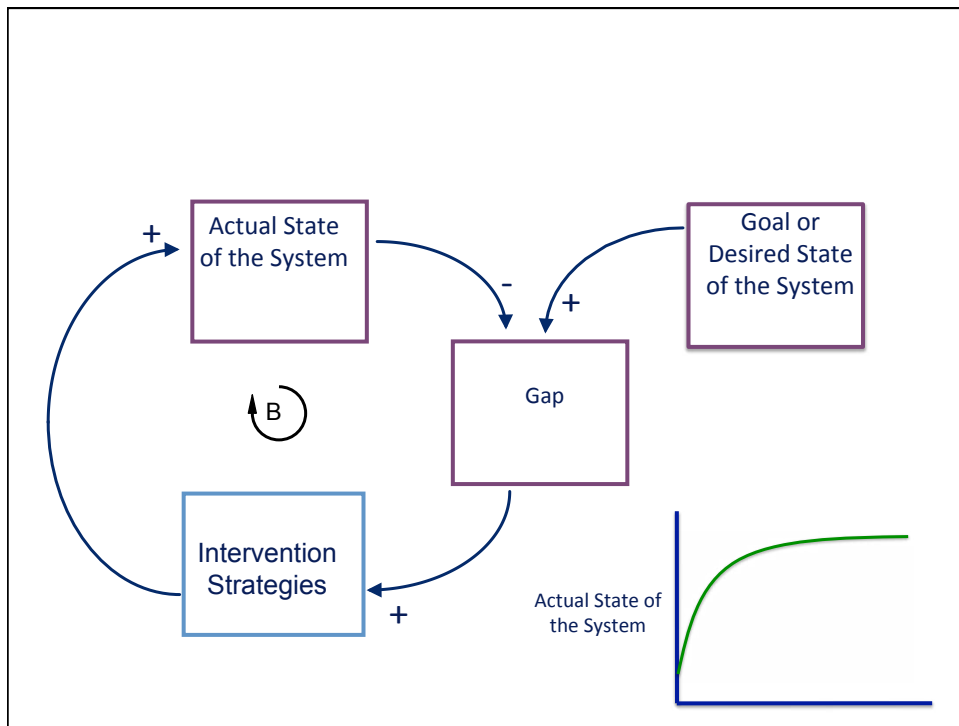
Balancing Feedback



- “We are experiencing some subtle ups and downs.”
- “I can sense that things are beginning to settle down.”
- “We seem to be achieving balance and stability.”
- “Our system is close to reaching our goals.”

Balancing Feedback

- Creates an equalizing or oscillating effect
- Examples of balancing feedback:
 - Room temperature: “When the thermostat is working, the room temperature tends to be constant when it is hot outside.”
 - Exercise: “When I play basketball, my cardiovascular system and muscles are working very hard. I appreciate timeouts that give me short rest, and then I am able to get back in the game and play hard again.”
 - Supply and demand: “When fewer items are available, the price can be high, but when many are available, they tend to go on sale.”
 - Television volume: “Sometimes I have to turn the volume down during commercials to keep the volume at a constant level.”





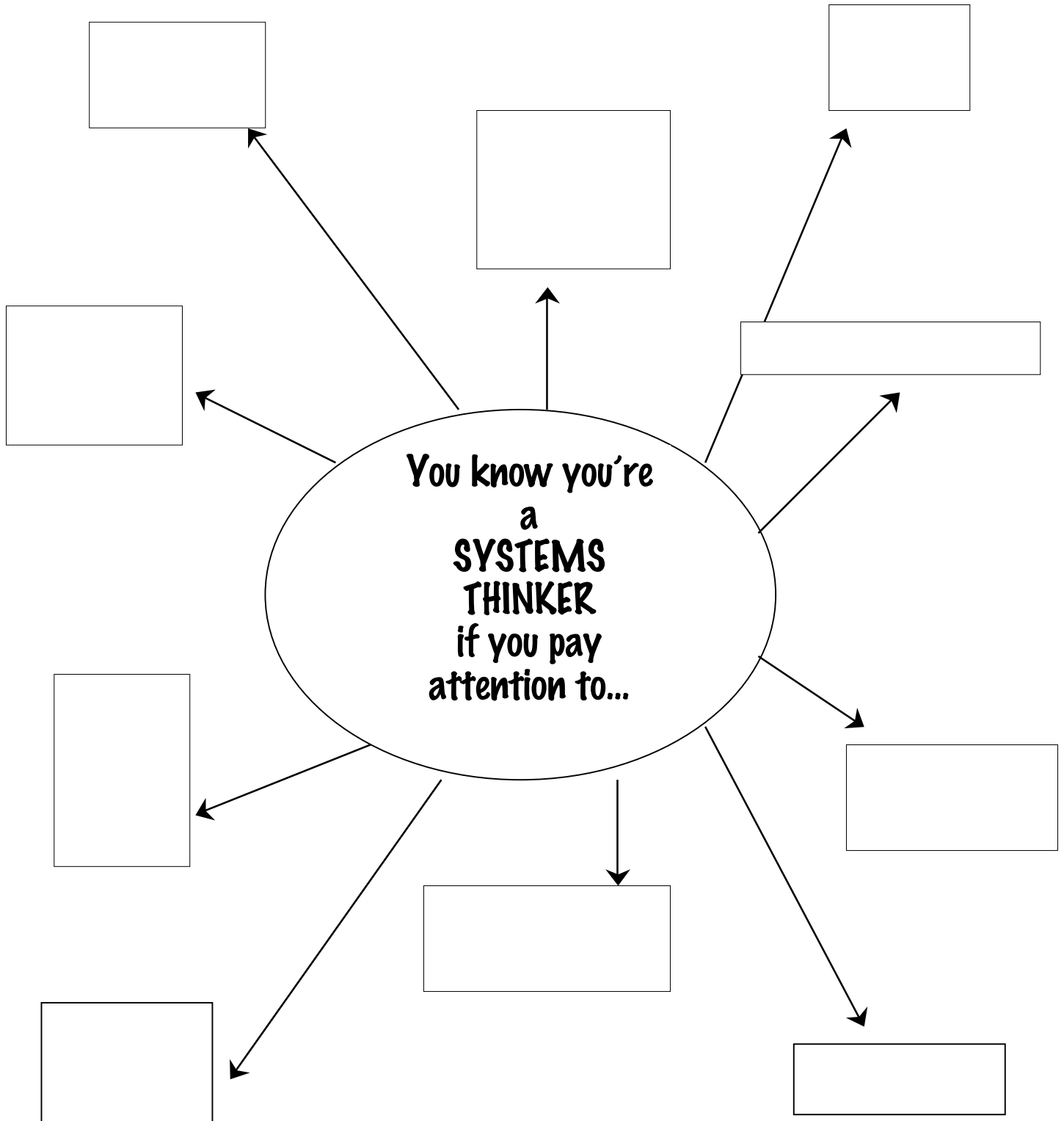
What are ways that you manage creative tension in your work setting?

What are the indicators that tell you the gap is too small or too big among your colleagues and others with whom you work?



Reflecting on your iceberg, what might you see as leverage actions that you may not have considered before?

Habits of a Systems Thinker





What new learning, insights and/or new approaches to leadership have you developed today? How will your systems thinking learning impact you and your work?