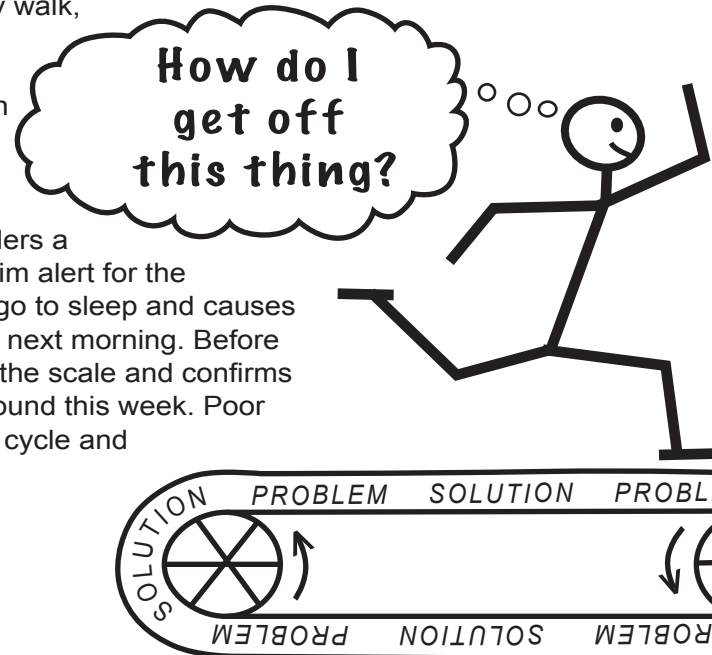# S.T.O.P. Systems Thinking Opens Possibilities
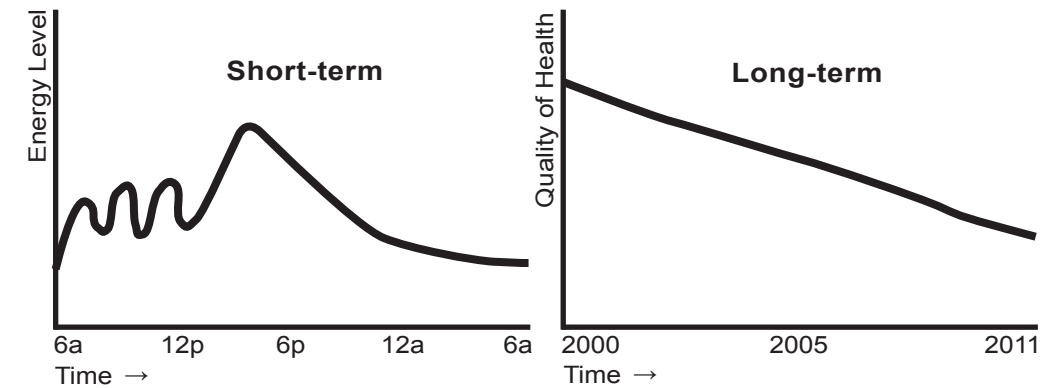## for Systems Understanding and Sustainable Change

1. Tell Story:

The Coffee Crutch. Having overslept, Joe grabs a cup of coffee for breakfast as he sprints out the door for work. By midmorning his energy slumps causing him to drink another cup of coffee. At lunchtime, as coworkers leave for their daily walk, Joe heads to the vending machine for a candy bar and soda. During his midafternoon meeting, Joe feels sleepy. He goes to the latte stand and, thinking about the work he'll need to do that night, orders a triple shot latte. This keeps him alert for the evening but makes it hard to go to sleep and causes him to be even more tired the next morning. Before bed, Joe reluctantly steps on the scale and confirms that he has gained another pound this week. Poor Joe seems to be trapped in a cycle and doesn't know how to break it.

How do I get off this thing?

PROBLEM SOLUTION PROBLEM / SOLUTION PROBLEM SOLUTION PROBLEM SOLUTION

Systems Analysis in Six Steps

1. **Tell Story**
2. **Sketch Trends**
   - *Behavior Over Time Graph*
3. **Name Variables**
4. **Set System Boundaries**
5. **Make System Visible**
   - *Connection Circle*
   - *Causal Loop Diagram*
   - *Stock / Flow Diagram*
6. **Determine Leverage Points**

2. Sketch Trends: Behavior Over Time Graphs

Energy Level — **Short-term** — Time → (6a, 12p, 6p, 12a, 6a)

Quality of Health — **Long-term** — Time → (2000, 2005, 2011)

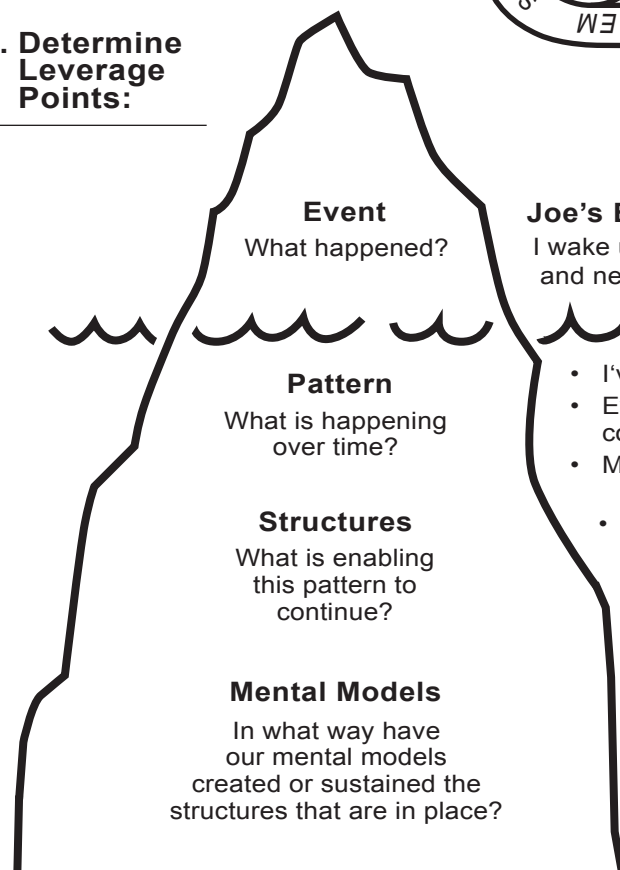## 3. Name Variables:

- Energy level
- Caffeine intake
- Sugar intake
- Quality of diet
- Amount of sleep
- Amount of exercise
- Tolerance to caffeine
- Productivity
- Quality of health
- Workload
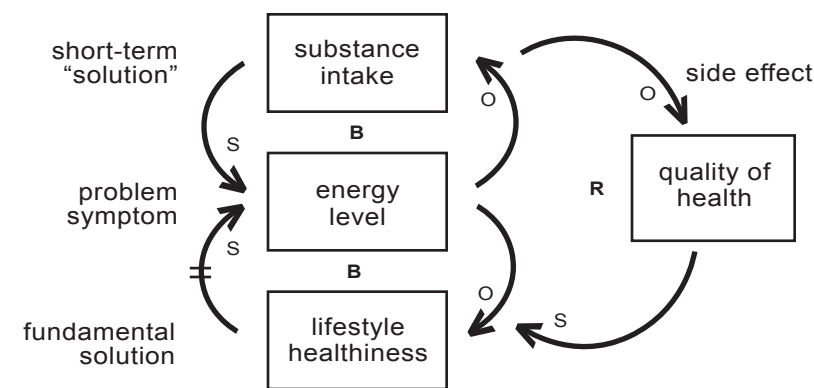
4. Set System Boundaries:

Joe at home and at work

6. Determine Leverage Points:

Event
What happened?

Pattern
What is happening over time?

Structures
What is enabling this pattern to continue?

Mental Models
In what way have our mental models created or sustained the structures that are in place?
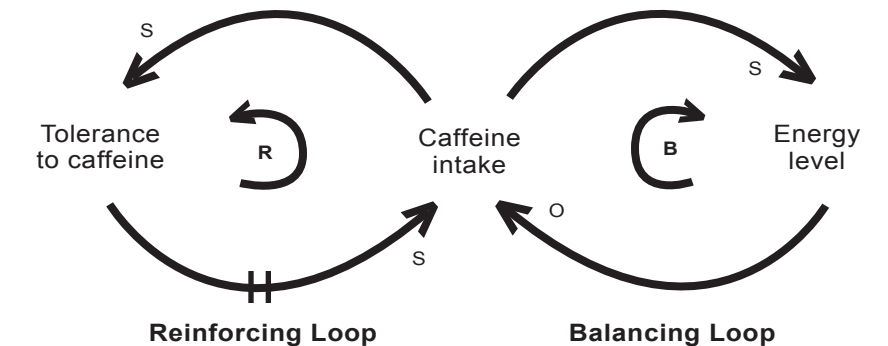
Joe's Example:
I wake up exhausted and need COFFEE!

- I've gained another pound.
- Everyday, I get tired and need coffee throughout the day.
- My health continues to degrade.

- Starbucks at every corner.
  - Nearest health club is 30 minutes away.
    - Joe lives 50 miles from work.

- I know caffeine is a short-term fix but there is no harm in it.
- To stay competitive, I need to work a lot of hours.
- I'm young and therefore my body can take anything for a few years.
- I've only gained a few pounds since college which I can easily lose if I want to.

5. Make System Visible: Causal Loop Diagrams

short-term "solution" — substance intake
problem symptom — energy level
fundamental solution — lifestyle healthiness
side effect — quality of health
B, B, R, S, O

Shifting the Burden Archetype

Tolerance to caffeine — **R** — Caffeine intake — **B** — Energy level
S, O, S

Reinforcing Loop   **Balancing Loop**

"The best way out of this [shifting the burden] trap is to avoid getting in. Beware of symptom-relieving or signal-denying policies or practices that don't really address the problem. Take the focus off short-term relief and put it on long-term restructuring."

Donella Meadows, *Thinking in Systems*

10/11/12