



Systems + *Literacy*

WORKSHOP OUTLINE

Learning in the 21st Century

People are talking, a lot about the skills our children will need to thrive in the 21st century.

- What kind of future are we preparing our students for?

Thinking about (Living) Systems

Is everything a system? If not...

- What is a system?
- Why are the obstacles to thinking about systems?
- What are the *habits of mind* of one applies systems thinking in everyday situations?
- Where do we see these habits being encouraged or demonstrated in school?
- What are the *deeper questions* a systems thinker asks?

Systems Thinking can be an antidote to:

- Fragmented thought
- Jumping to conclusions
- Short-sighted decision making
- Event focus
- Excessive reductionism

A Bold Claim:

Systems thinking will make students better thinkers, better readers, better consumers and better citizens.

Weaving Systems Thinking into the Curriculum Web

Sometimes bringing systems thinking into schools has to be like bringing in a Trojan horse. It has to look like it is something else.

- Where does systems thinking fit into a curriculum web?
- Systems + *Literacy* Mash Ups: How do systems thinking and literacy skills mesh? What about Critical Thinking?
- How can teaching kids to “think about systems” improve comprehension and enhance understanding?
- What lies beyond “chain of event” maps?

Using Systems Stories

When we combine **Systems** + *Literacy*, we repurpose compelling stories (including folktales, fables, picture books and chapter books) to introduce the key concepts of systems thinking.

A Five-Step Systems Thinking Flow:

1. *Tell the Story* (retelling helps to improve comprehension)
2. *Name the Elements* (and build vocabulary)
3. *Describe the Changes Over Time* (create graphs)
4. *Make the System Visible* (help us see the threads of cause and effect)
5. *Test and Share* (talk with peers, make recommendations)

My Teachers

Here is a short list of Literacy development resources:

Stephanie Harvey and Anne Goudvis *Strategies That Work: Teaching Comprehension to Enhance Understanding* (2000)

Hope Vestergaard, *Weaving the Literacy Web: Creating Curriculum Based on Books Children Love* (2005)

Ellin Oliver Keene and Susan Zimmermann's *Mosaic of Thought: Teaching Comprehension in a Reader's Workshop* (1997)¹

¹ Special thanks to Jude Garnier (Gates Small Schools project) and Jennifer Cirillo (Shelburne Farms) for vetting many of these ideas. Thanks as well to the faculty the Barnes Elementary School in Burlington Vermont, and in particular, to their principal, Paula Bowen, for their feedback and encouragement. Special thanks to Simone Amber of SEED/Schlumberger for supporting much of the folktale related research, writing and development of my upcoming book: *Connected Wisdom: Living Stories about Living Systems* (September, 2008).

Classroom Activities/Systems + Literacy

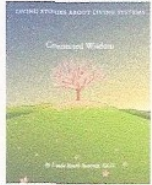



More, more, more!
Understanding reinforcing feedback

Activities:
Read & Compare 2 (or more) stories
Gecko's Complaint
Dexter Bottle Book
Graph behavior-over-time
Look for similar patterns

Literacy/Critical Thinking link:
Ask questions
Identify connections
Create ladder vocabulary on graph
Identify and visualize the "the system"
Analyze Perspectives

Curriculum links:
Language arts, social studies
natural science

Extension: Run the "Living Loops" activity (ST Playbook)

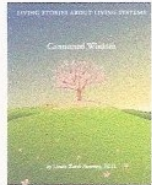


Nothing Stands Alone
Understanding interdependence

Activities:
Read & Compare stories:
Gecko's Complaint
The Old Ladies Who Like Cats
Look for interconnections

Literacy/Critical Thinking link:
Ask questions
Identify and visualize interconnections
Look for similar patterns of interconnection

Curriculum links:
Language arts, social studies,
Ecosystems/natural science

Extension: Run the "Web of Life" activity (ST Playbook)

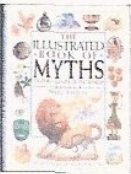

Thinking Like a Bathtub
Understanding stocks & flows

Activities:
Read folktale
Look for similar (stock/flow) patterns in other stories

Literacy/Critical Thinking link:
Ask deeper questions
Create ladder vocabulary on graph
Visualize the connections

Curriculum Link:
Math, science, social studies

Extension: Play the Forster & Lambcock simulation
www.seed.sib.com/en/scicr/wato
[h/climate_change/stock.htm](http://climate_change/stock.htm)

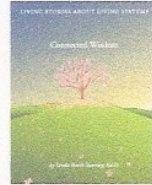

Why You Don't Get 2 Cows If You Cut a Cow In Half
Understanding Systems Integrity

Activities:
Read & Compare 2 stories
Belly and Other Members
Parts of the House Argue
Look for similar patterns

Literacy/Critical Thinking link:
Ask questions
Visualize the connections

Curriculum link:
Ecosystems/natural science, social studies

Extension: Play the "Triangles" game (ST Playbook: Vol. III)


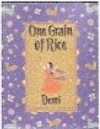

The Power of Doubling
Understanding Exponential Growth

Activities:
Read & Compare stories
One Grain of Rice (younger)
Sissa and the Troublesome Trifles (older)
Look for and discuss similarity in patterns

Literacy/Critical Thinking link:
Ask questions
Create ladder vocabulary on graph
Visualize the connections

Curriculum link:
Math, science, language arts, unit on money

Extension: Do the "Paperfold" activity (ST Playbook: Vol. I)

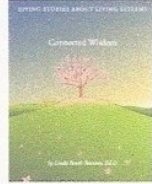




What Goes Around Comes Around
Understanding Natural Cycles

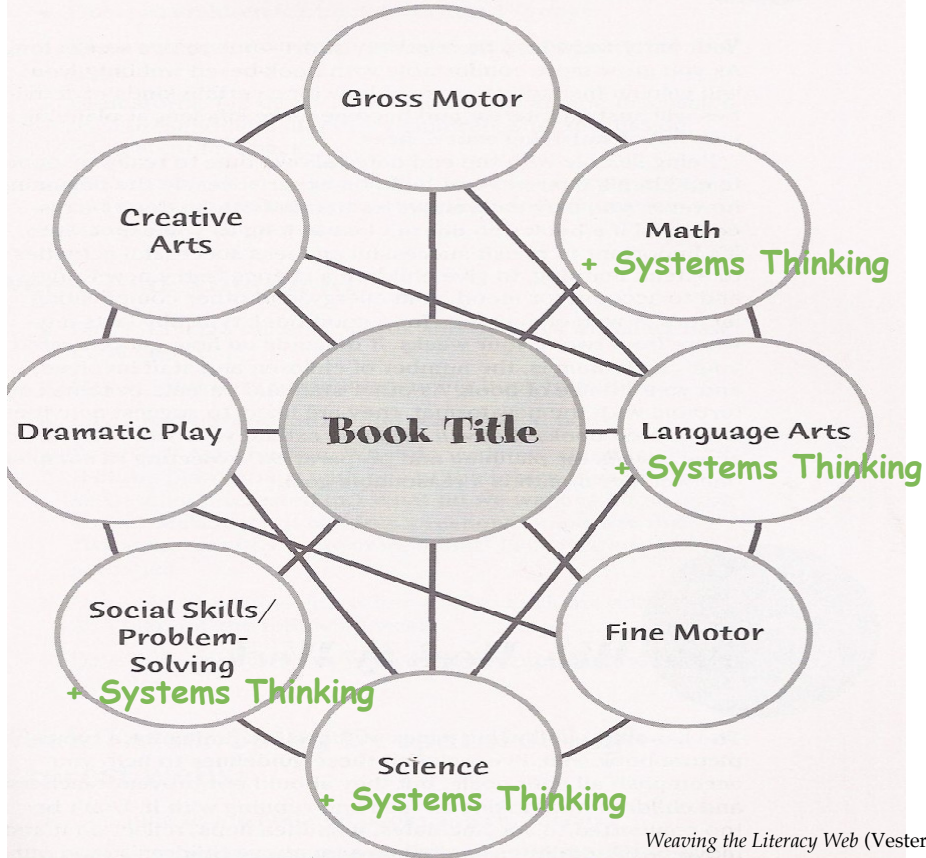
Activities:
Read & Compare 2 stories
Tale of the Sands
The Myth of Persephone
Look similar patterns

Literacy/Critical Thinking Link:
Ask deeper questions:
What happens when we interrupt natural cycles?
Visualize the connections

Curriculum Link:
Ecosystems/natural science, personal health



A Basic Book Web



Weaving the Literacy Web (Vestergaard, 2005)

**Literacy Skills of
Proficient Readers**
(Harvey and Goudvis, 2000)

Search for connections
between what they know & the new information
they encounter in the texts they read.

Ask questions
of themselves, the authors they encounter, and
the texts they read

Draws inferences
during and after reading

Distinguish
important from less important ideas in text

Synthesize information
within and across texts and reading experiences

Repair
faulty comprehension

Monitor
the adequacy of their understanding.

Visualize & create images
using the different senses to better understand
what they read.

**Systems Thinking
Habits of Mind**
(L. Booth Sweeney, 2008)

Looks for connections
and thinks about the interrelations that
make up the "whole."

Asks deeper questions
For instance, "what happens next?"

Pattern Collection

Distinguish important from less
important ideas in text

Changes Perspective to increase
understanding

Surfaces and tests assumptions
about how the world works and looks for
how they may limit thinking.

Makes systems visible
using the different senses to better
understand what they read.