NXPLORERS FUTURE TALKS

The importance of Systems Thinking in education

Shell NXplorers

Shell NXplorers

Waters Center Systems For Thinking

The Importance of Systems Thinking in Education

Who we are, What we do, Why it matters

Dr. Tracy Benson, President
Mary Quinnan, Vice President

We help people understand what systems thinking is and how to incorporate the Habits, tools and concepts of systems thinking into their work and life to achieve desired results.

Systems thinking is a necessary approach to create sustainable and equitable systemic change that will make communities and our world a better place for all.

Waters Center
For Systems Thinking

501 (c)(3) non-profit

Our Team






Our Credentialed Facilitators

Facilitators are credentialed through the Waters Center Advanced Facilitator Credential program. Click on a photo to learn more about tl















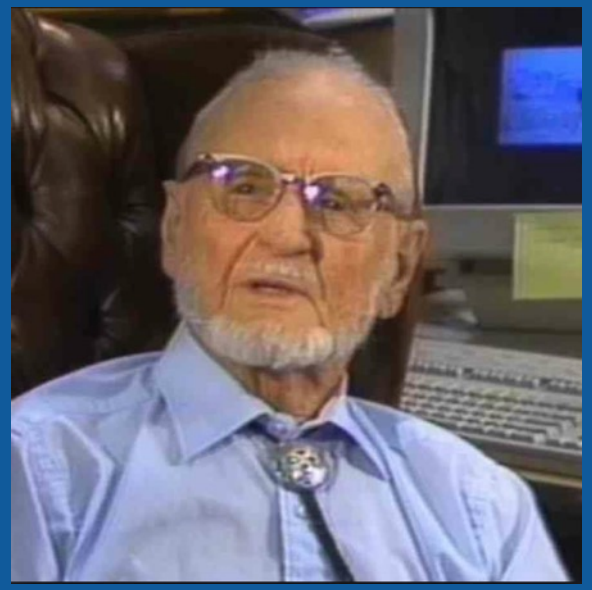





Our Beginning

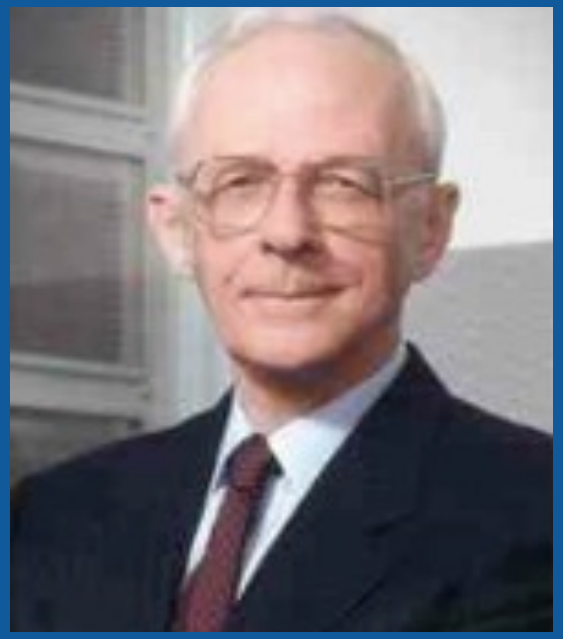
Catalina Foothills School District
Tucson, Arizona

Gordon Brown
Professor Emeritus
School of Engineering, MIT



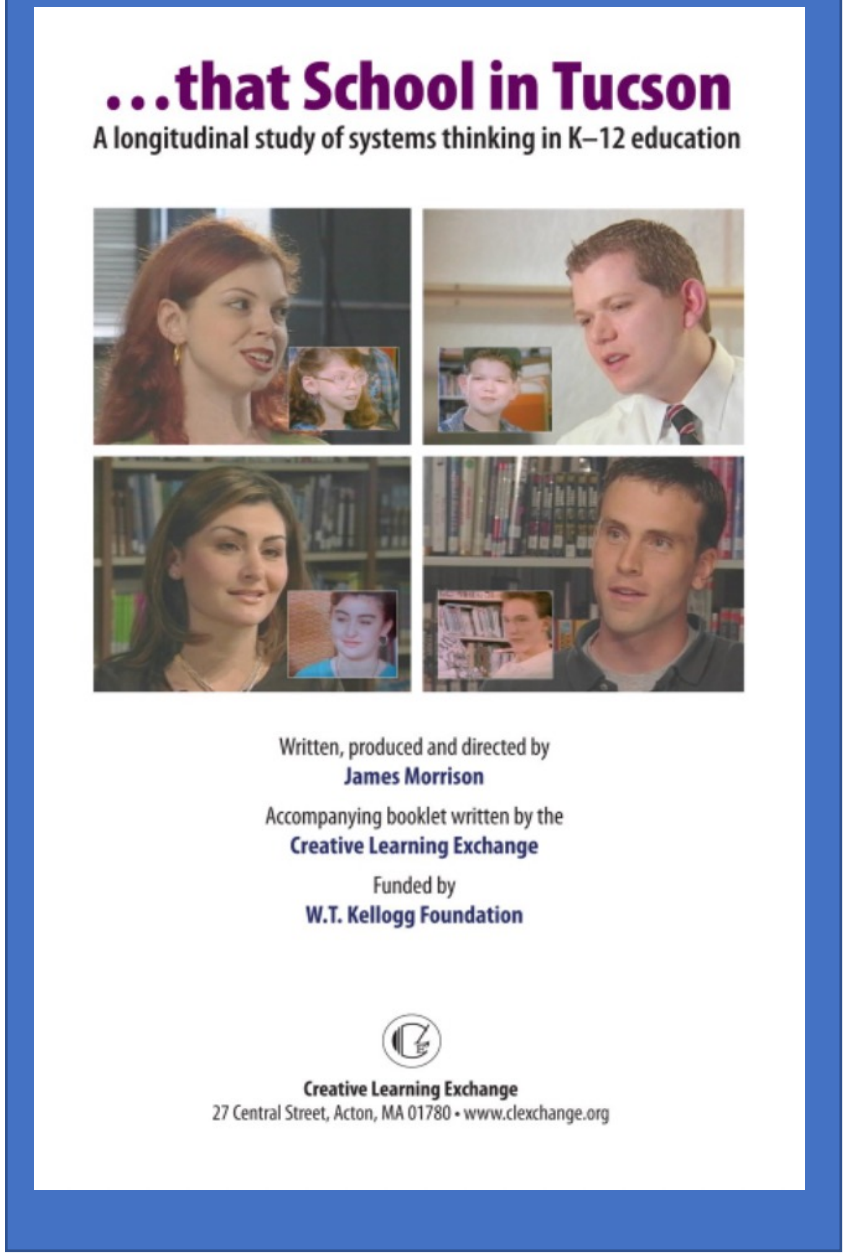
Faith and Jim Waters
Founders of the Waters Foundation

Jay Forrester
Professor Emeritus
Sloan School of Management, MIT



Waters Foundation, Systems Thinking in Education is Born

Catalina Foothills School District
Tucson, Arizona



Collaborative Action Research
2000 - 2006

Over one hundred teachers and administrators from across the United States were involved in researching the effects of systems thinking methodologies on both student and teacher learning and school improvement.

Research Findings:
A meta-analysis of over 197 action research projects generated 5 key finding areas:

1. Make Thinking Visible
2. Create Connections
3. Identify & Solve Problems
4. Develop Readers & Writers
5. Increase Engagement

Our Approach to Building Systems Thinking Capacity

Waters Center For Systems Thinking

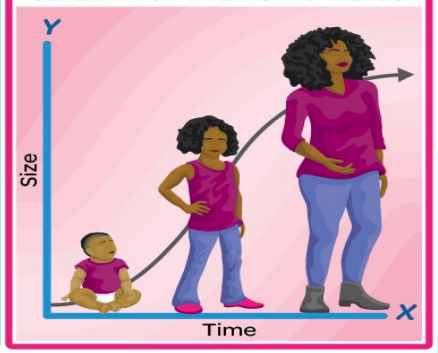
Common Vocabulary
Commonly Practiced Habits of Thinking
Accessible Visual Tools
Learning by Doing

HABITS OF A SYSTEMS THINKER

2020 Edition

SEEKS TO UNDERSTAND ***THE BIG PICTURE***

OBSERVES HOW ELEMENTS WITHIN SYSTEMS ***CHANGE OVER TIME***, GENERATING PATTERNS AND TRENDS



CHANGES PERSPECTIVES TO INCREASE UNDERSTANDING

RECOGNIZES THE IMPACT OF ***TIME DELAYS*** WHEN EXPLORING CAUSE AND EFFECT RELATIONSHIPS

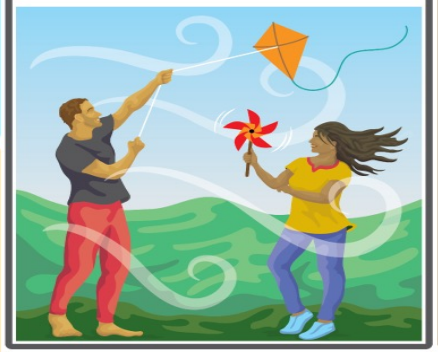
CONSIDERS HOW ***MENTAL MODELS*** AFFECT CURRENT REALITY AND THE FUTURE

CONSIDERS AN ISSUE FULLY AND RESISTS THE URGE TO COME TO A QUICK CONCLUSION

USES UNDERSTANDING OF SYSTEM STRUCTURE TO IDENTIFY POSSIBLE ***LEVERAGE ACTIONS***

IDENTIFIES THE ***CIRCULAR NATURE*** OF COMPLEX CAUSE AND EFFECT RELATIONSHIPS

RECOGNIZES THAT A SYSTEM'S ***STRUCTURE GENERATES*** ITS ***BEHAVIOR***



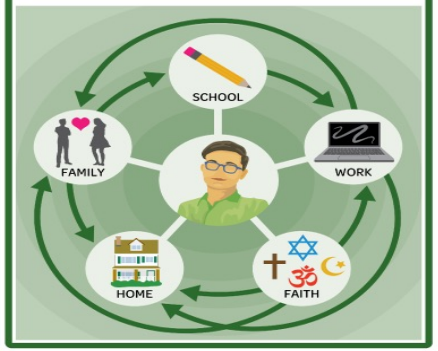
CONSIDERS SHORT-TERM, LONG-TERM AND UNINTENDED ***CONSEQUENCES*** OF ACTIONS

CHECKS RESULTS AND CHANGES ACTIONS IF NEEDED: ***"SUCCESSIVE APPROXIMATION"***

SURFACES AND ***TESTS ASSUMPTIONS***

PAYS ATTENTION TO ***ACCUMULATIONS*** AND THEIR RATES OF CHANGE

MAKES ***MEANINGFUL CONNECTIONS*** WITHIN AND BETWEEN SYSTEMS

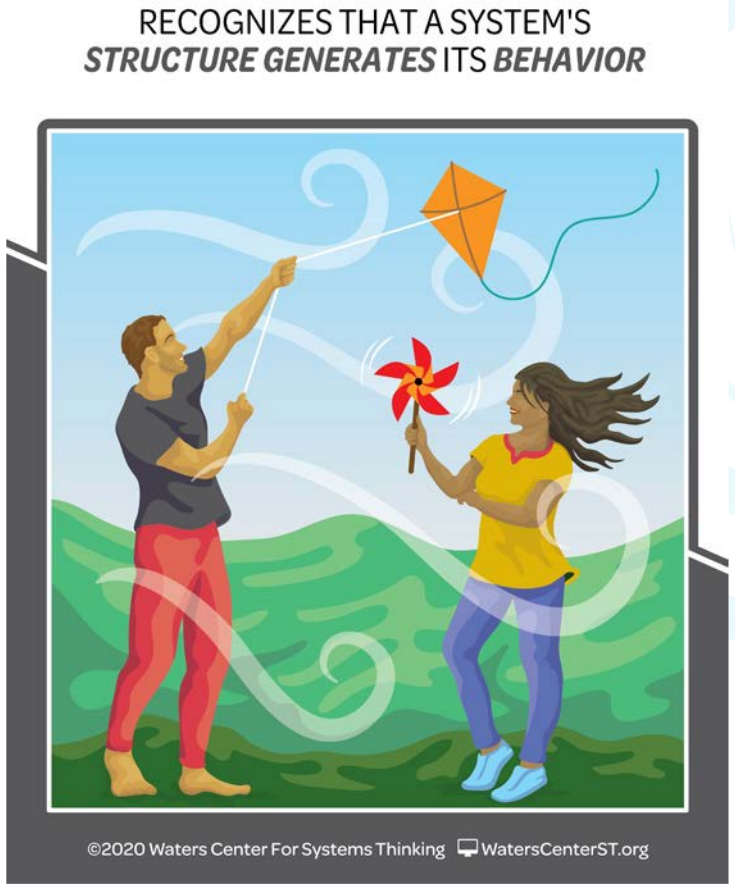


brought to you by
Waters Center
For Systems Thinking

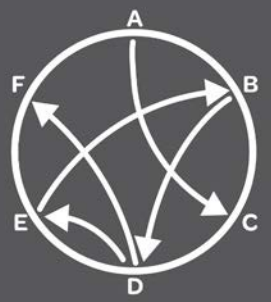
Waters Center For Systems Thinking

https://thinkingtoolsstudio.org/cards

SYSTEM'S STRUCTURE



RECOGNIZES THAT A SYSTEM'S
STRUCTURE GENERATES ITS ***BEHAVIOR***



A Systems Thinker focuses on system structure and avoids blaming when things go wrong.

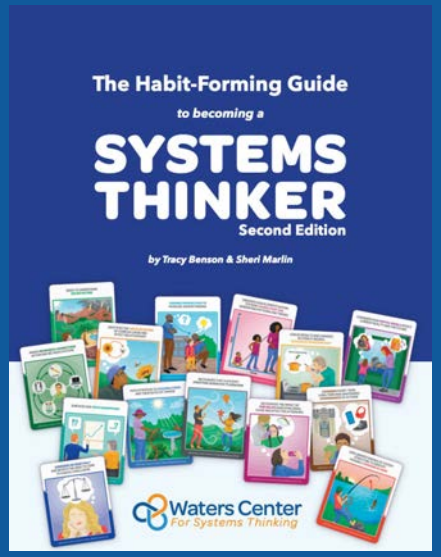
Questions to Ask

How do parts affect one another?

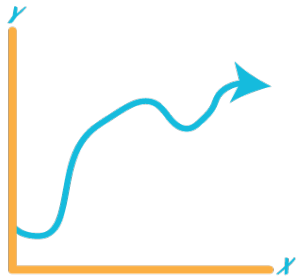
How does the organization and interaction of the parts create the behavior that emerges?

When things go wrong, how can I focus on internal causes rather than dwell on external blame?

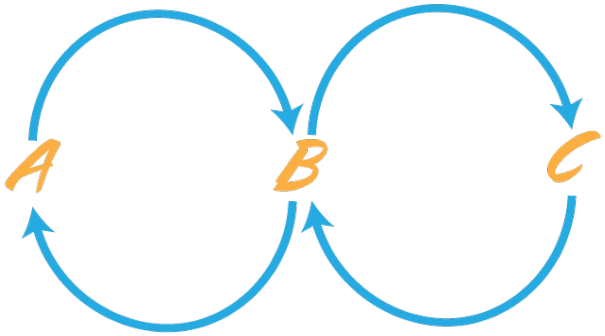
The Impact of the Habits of a Systems Thinker



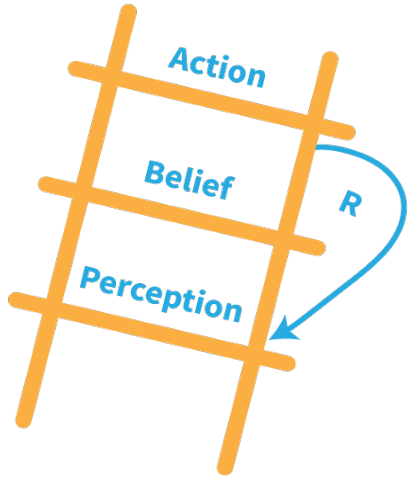
- We have translated versions in over 7 languages with others in the works.
- Our Habits cards customers include American Health Association, General Electric, Starbucks, Home Depot, and others.
- Our University users have grown 10-fold since the start of the pandemic and include Medical, Business & Education Schools, Public Health, Research-focused Institutions and others.
- We have sold/distributed over 80,000 sets of cards.



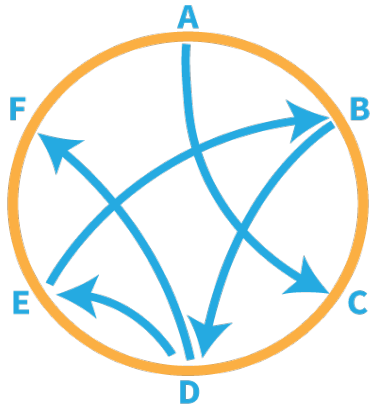
Behavior-Over-Time Graphs



Causal Loops

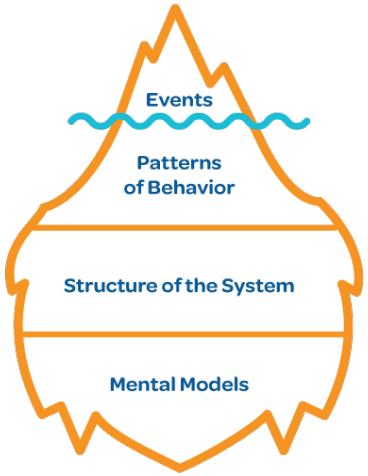


Ladder of Inference



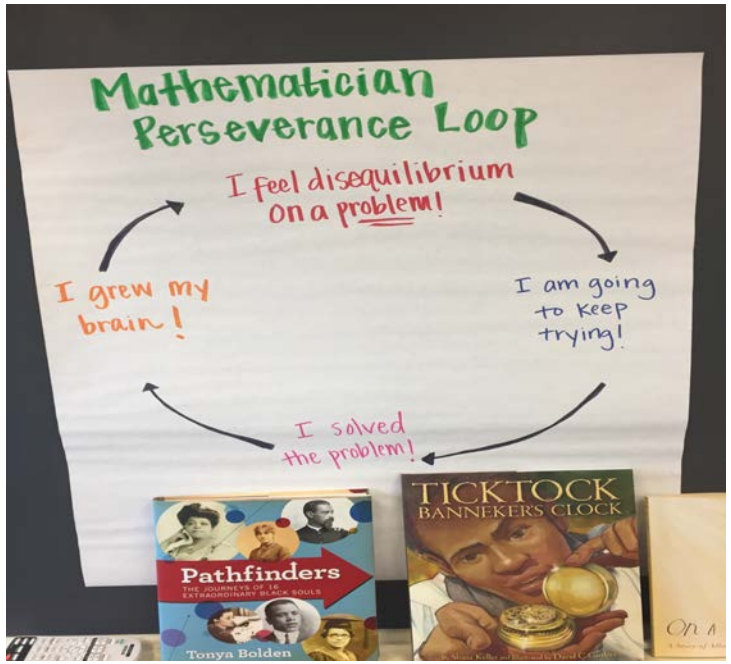
Connection Circles

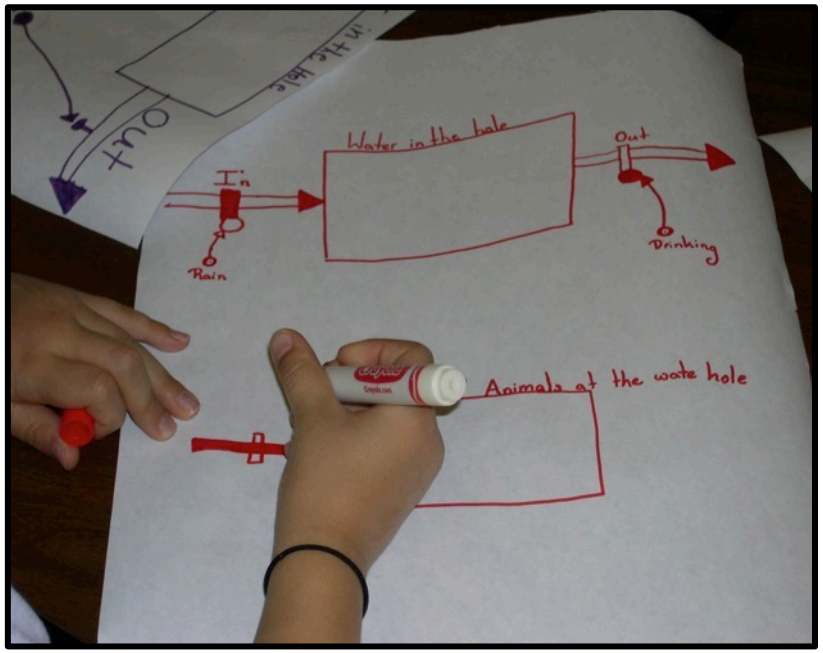
TOOLS OF SYSTEMS THINKING

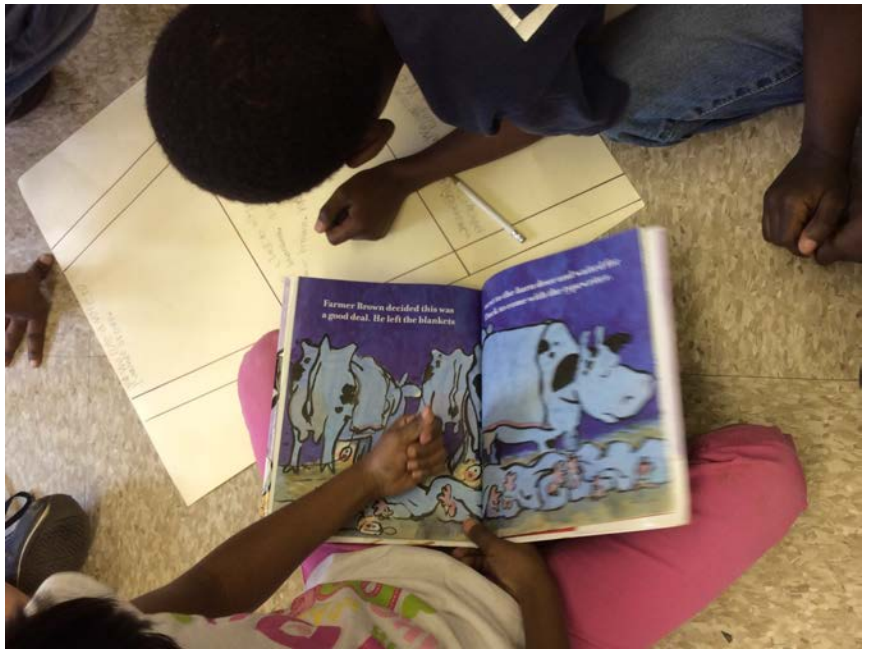


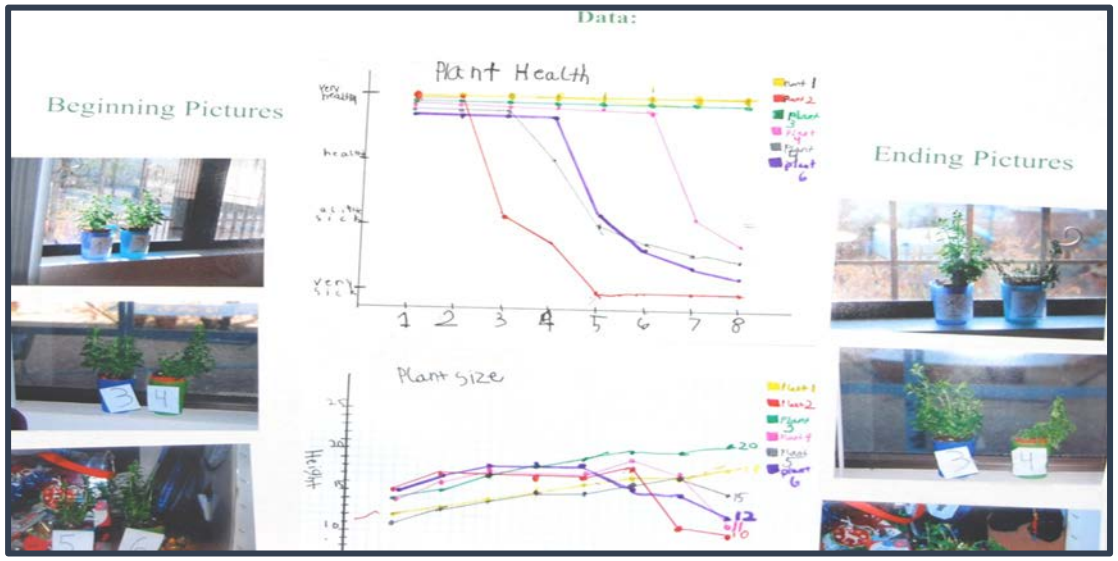
Iceberg

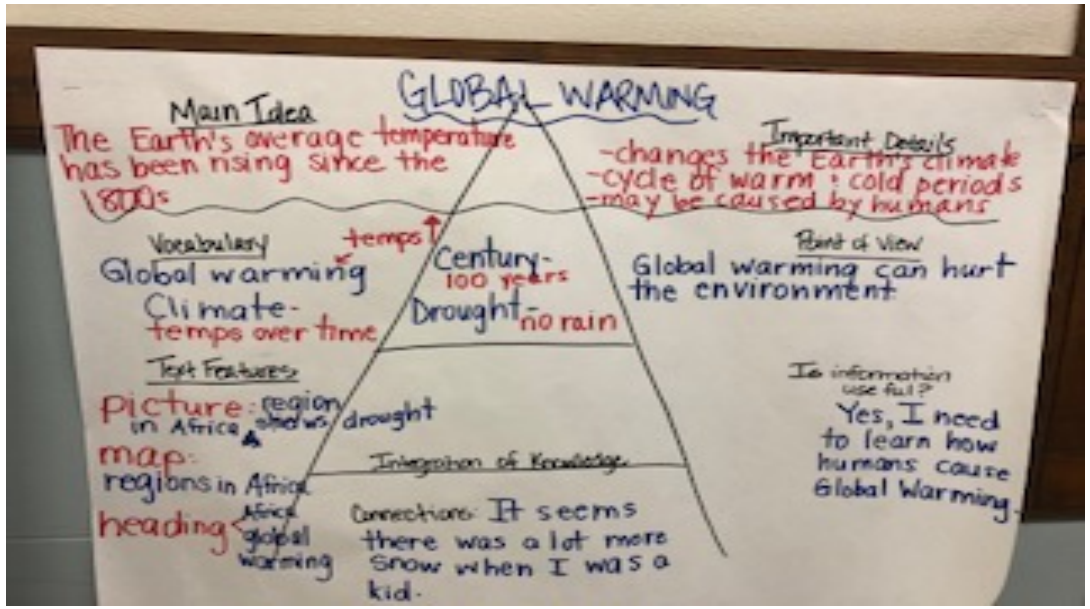
Stock-Flow Maps and Computer Models


Mathematician Perseverance Loop
I feel disequilibrium on a problem!
I am going to keep trying!
I solved the problem!
I grew my brain!
Pathfinders
Tonya Bolden
TICKTOCK
BANNEKER'S CLOCK

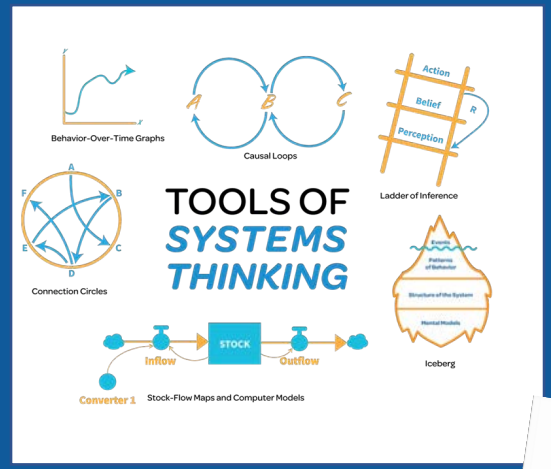

Water in the hole
In
Out
Rain
Drinking
Animals at the wate hole


Farmer Brown decided this was a good deal. He left the blankets


Data:
Beginning Pictures
Plant Health
Ending Pictures
Plant size


GLOBAL WARMING
Main Idea
The Earth's average temperature has been rising since the 1800s
Important Details
-changes the Earth's climate
-cycle of warm + cold periods
-may be caused by humans
Vocabulary
Global warming
temps
Climate- temps over time
Century- 100 years
Drought- no rain
Point of View
Global warming can hurt the environment
Text Features
picture: region in Africa shows drought
map: regions in Africa
heading: Africa global warming
Integration of Knowledge
Connections: It seems there was a lot more snow when I was a kid.
Is information useful?
Yes, I need to learn how humans cause Global Warming

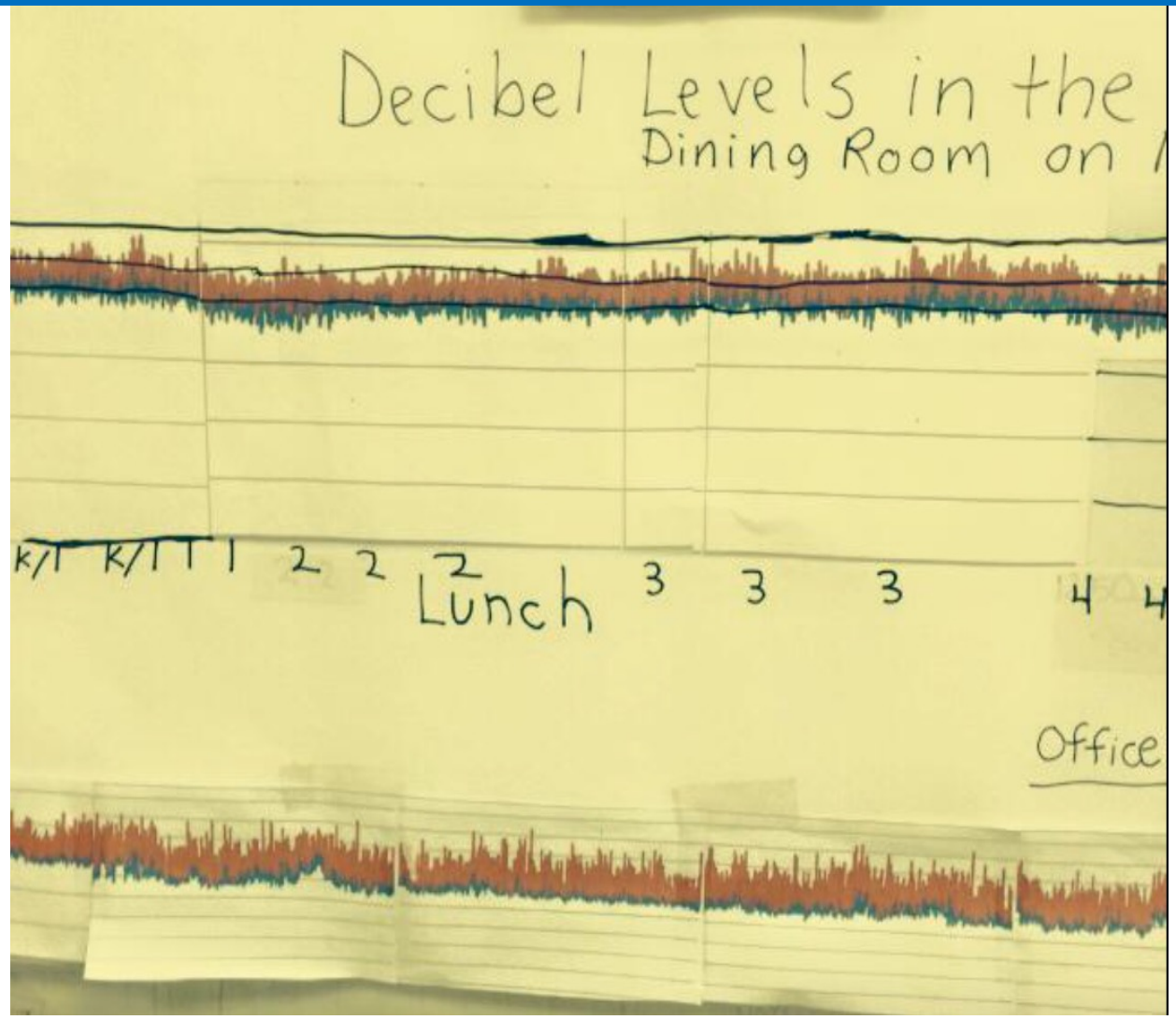
The Impact of Systems Thinking Tools

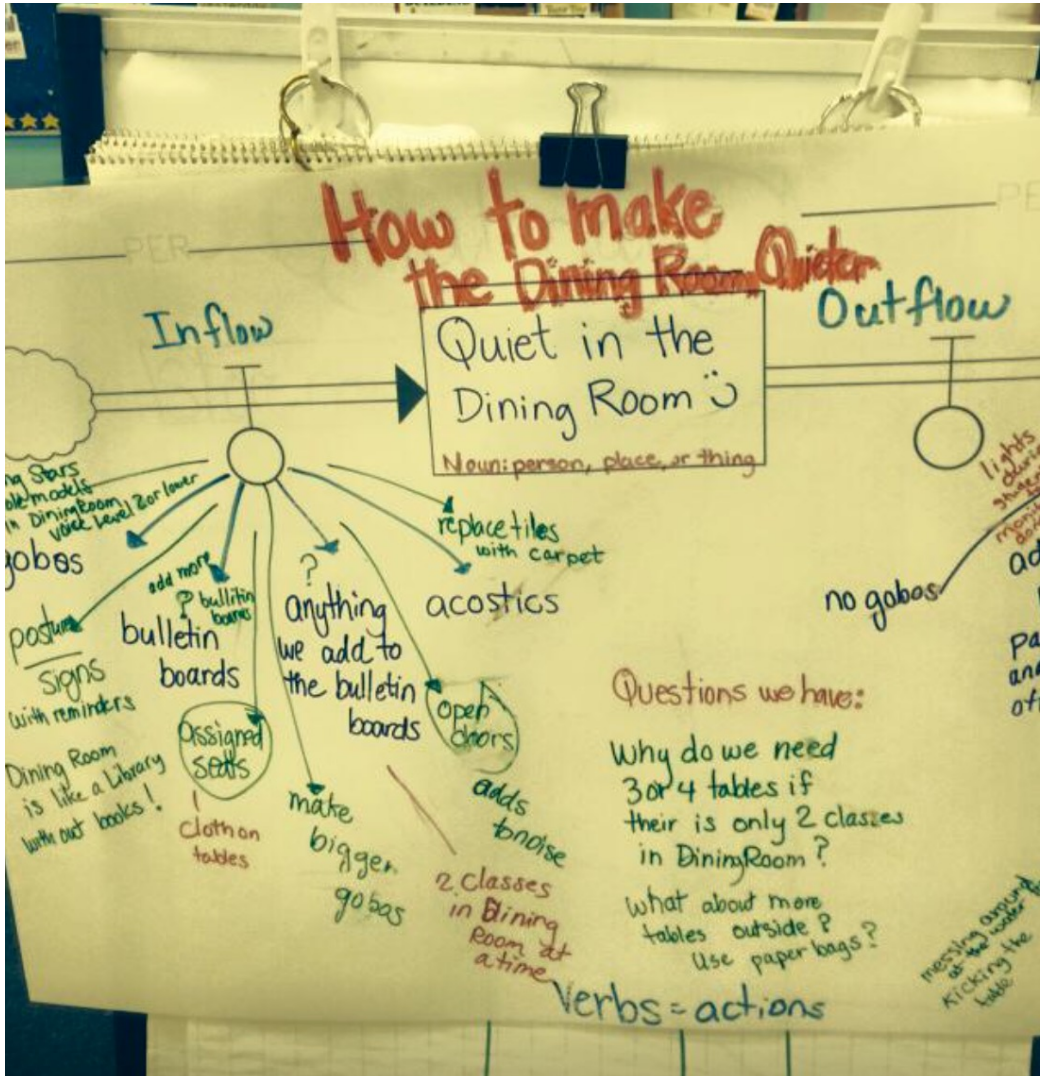


- Systems thinking utilizes a variety of tools that help make thinking visual.
- The tools help to bring our thinking and reasoning into a form that we can see and easily share with others.

The tools allow us to better understand current behaviors of a system and identify ways to operate within a system to create desired change.

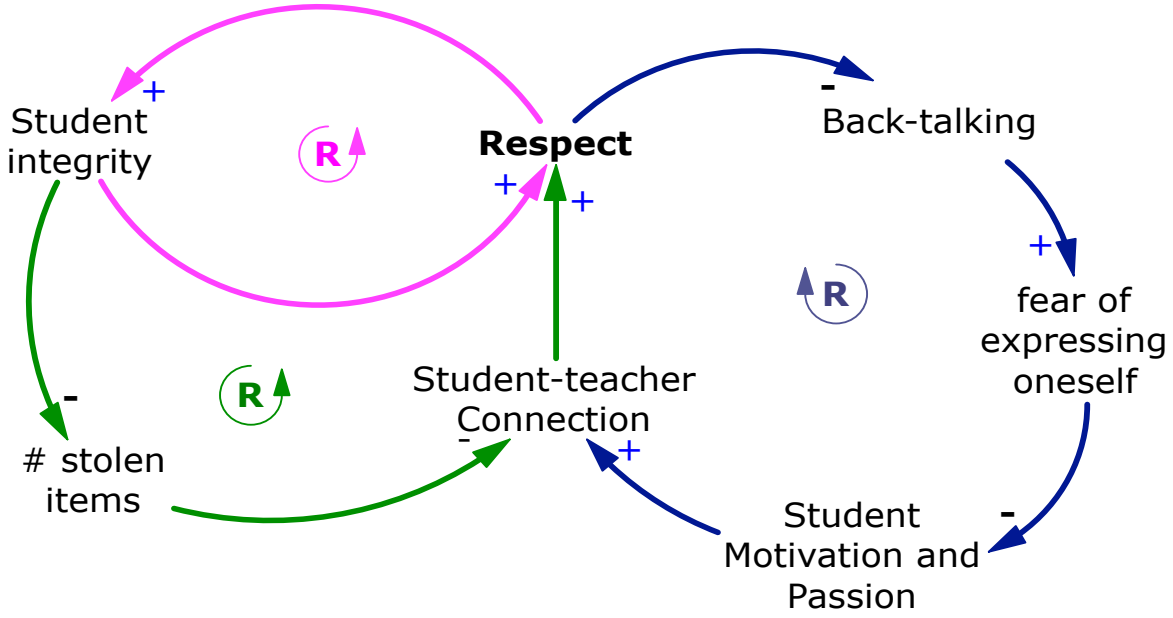
Our cafeteria was too noisy!

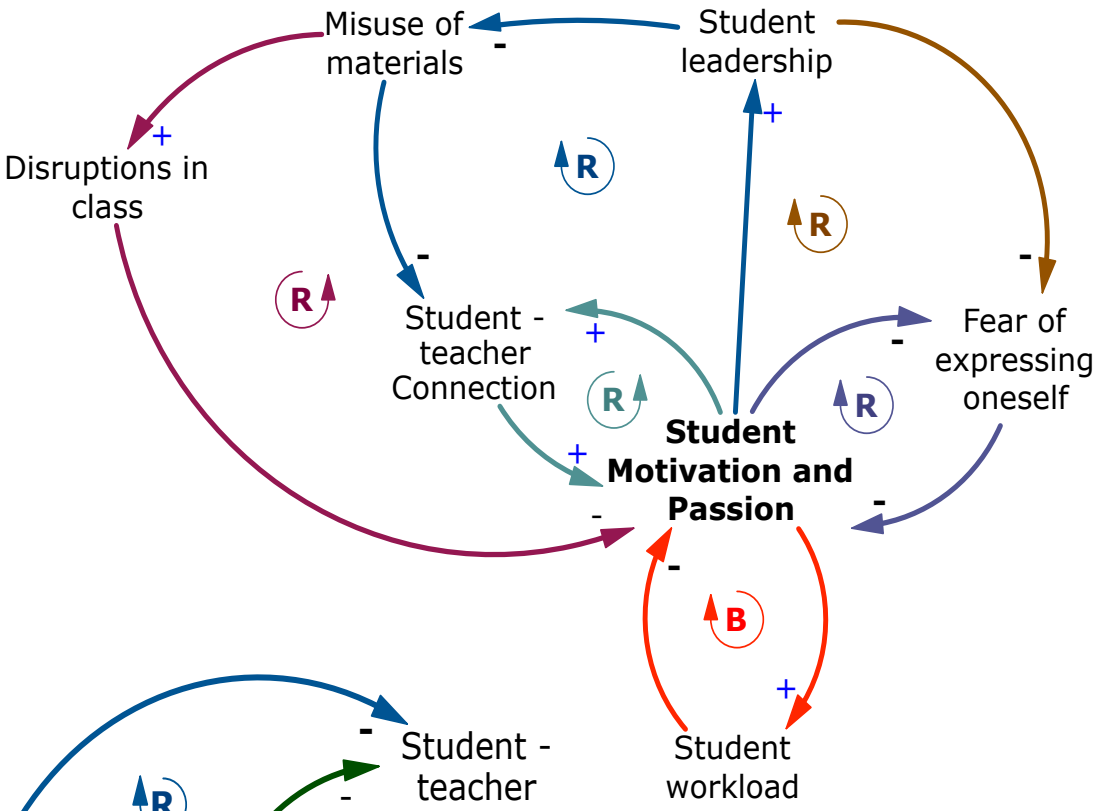


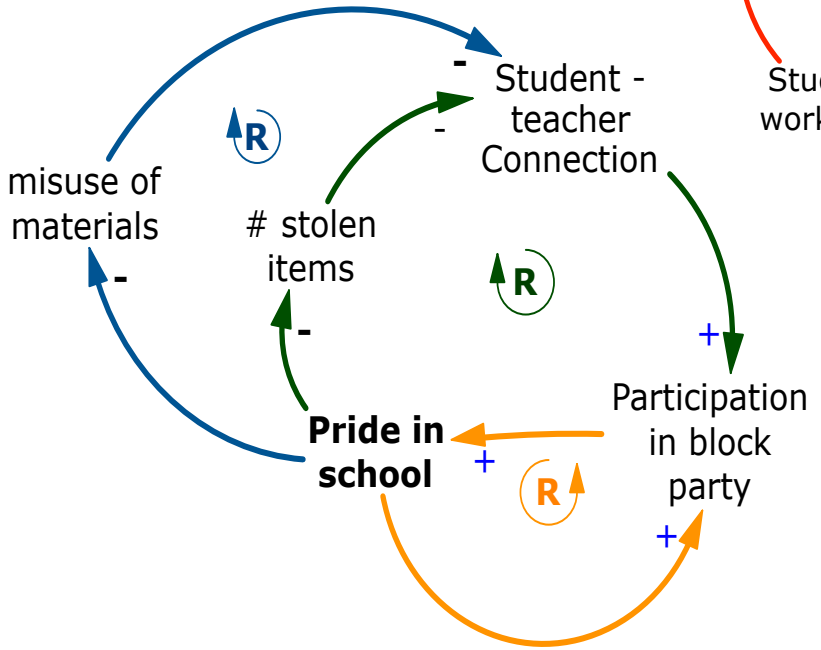


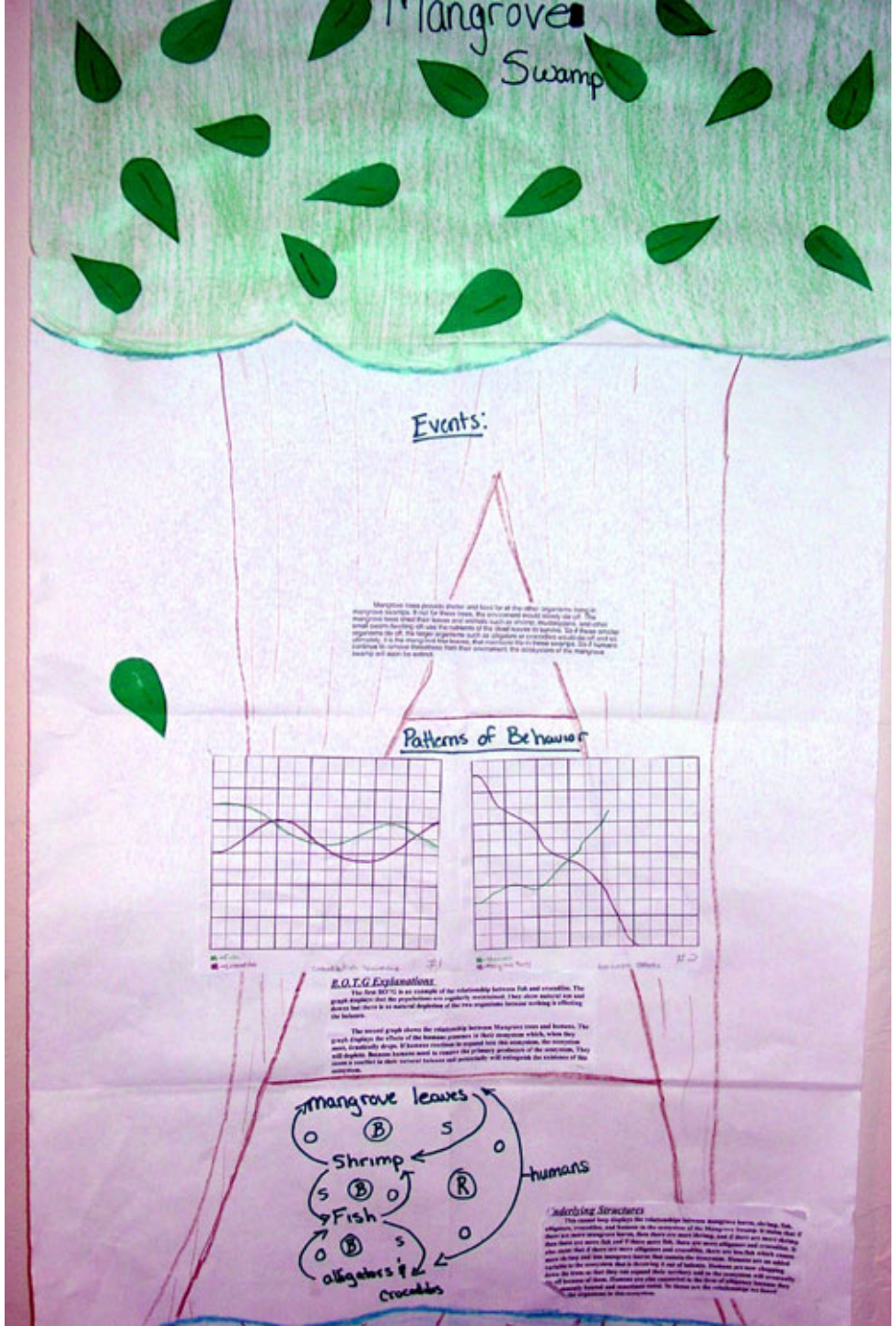
We wasted too much paper at our school.

We are working to improve our school culture.

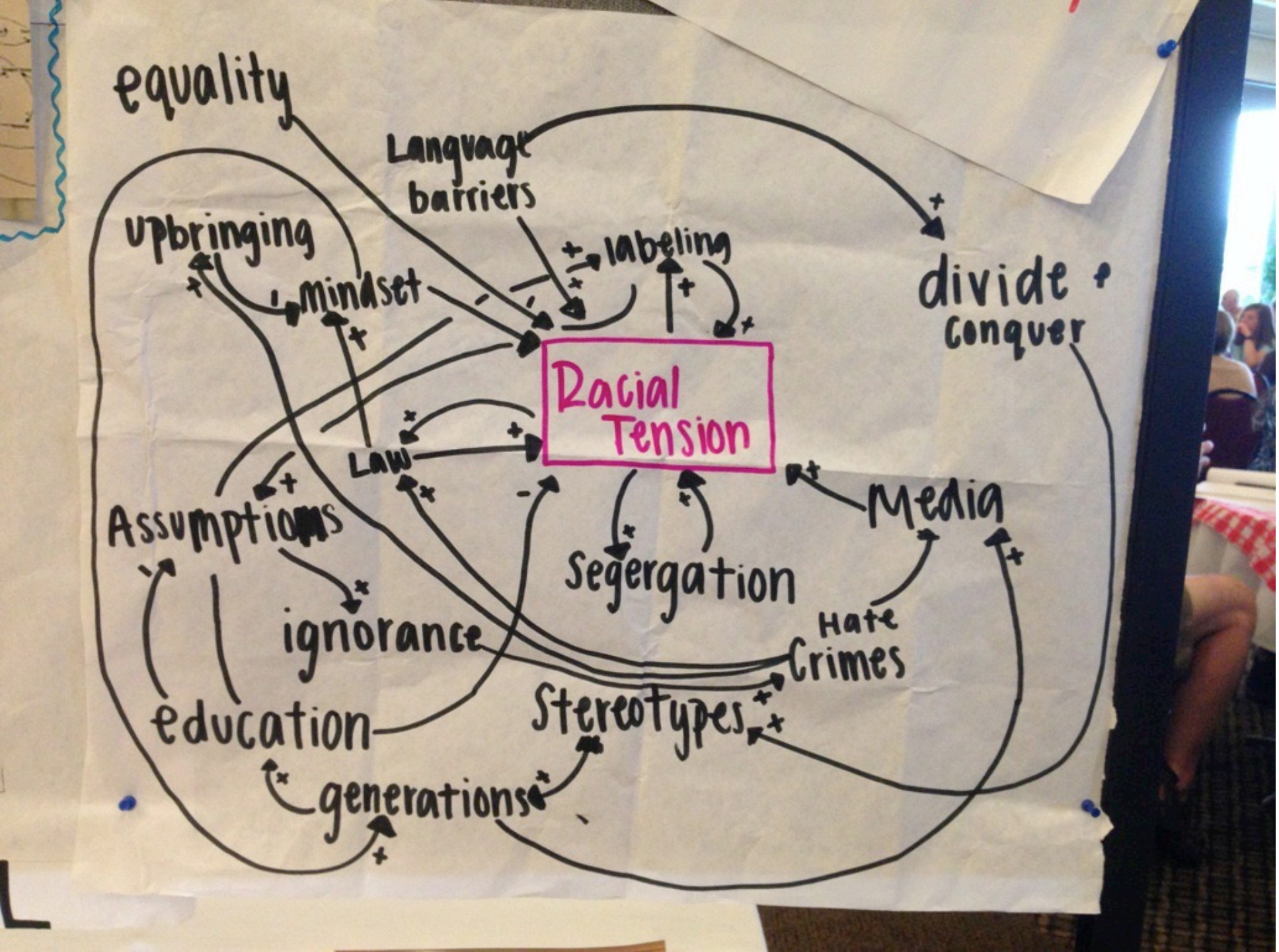




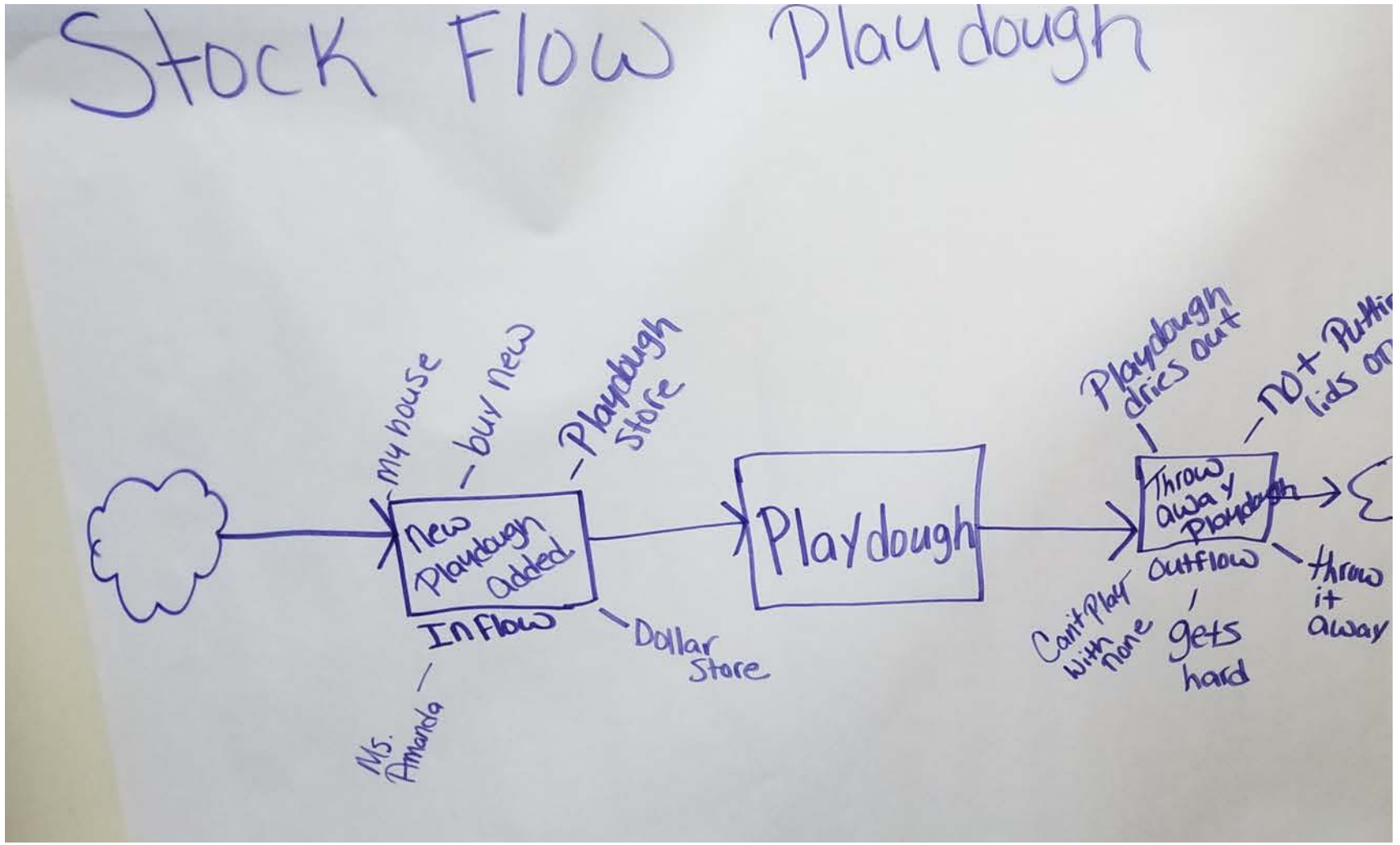




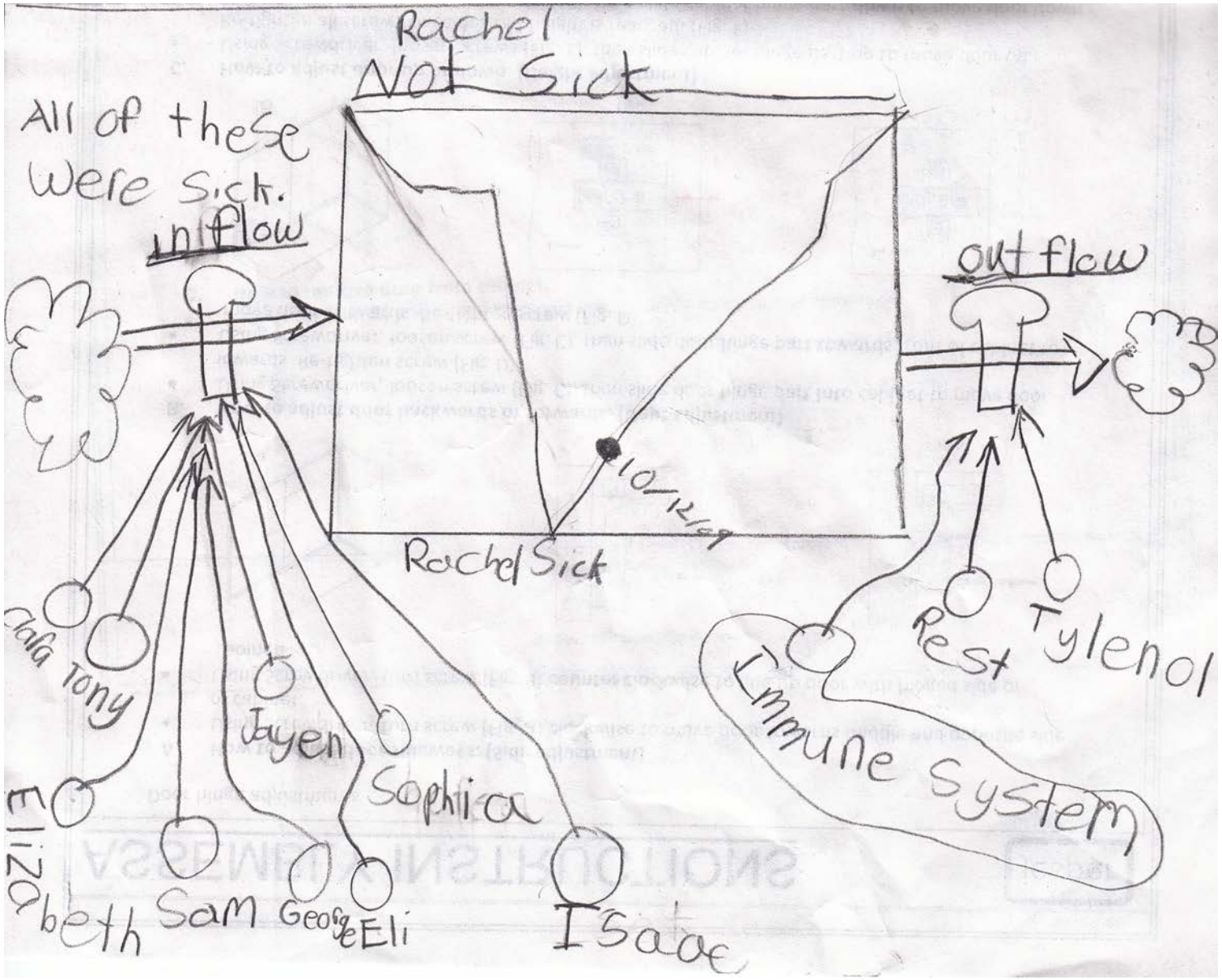
How can we best sustain the health of a mangrove swamp?



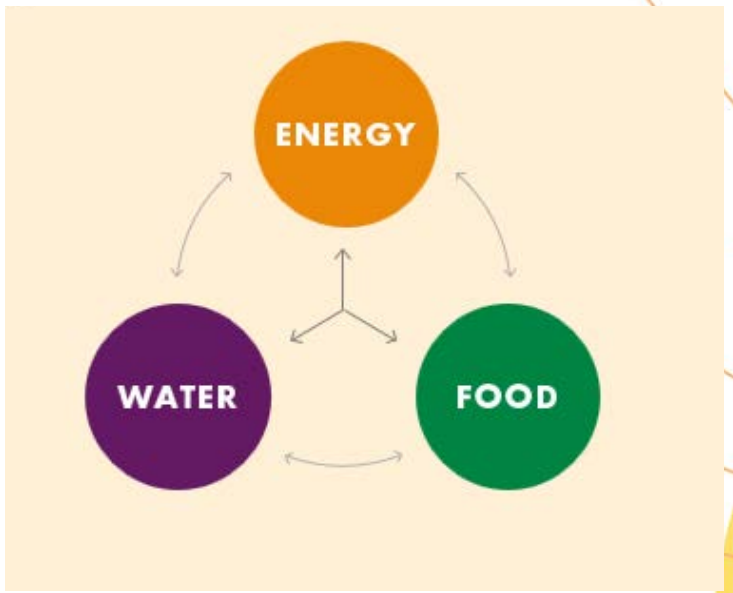
We wanted to decrease racial tension in our schools and community.


Stock Flow Playdough
My house
buy new
Playdough store
New Playdough added
Inflow
Ms. Amanda
Dollar Store
Playdough
Playdough dries out
Throw away Playdough
Outflow
gets hard
Can't play with none
Throw it away

Dynamics of Illness in the classroom

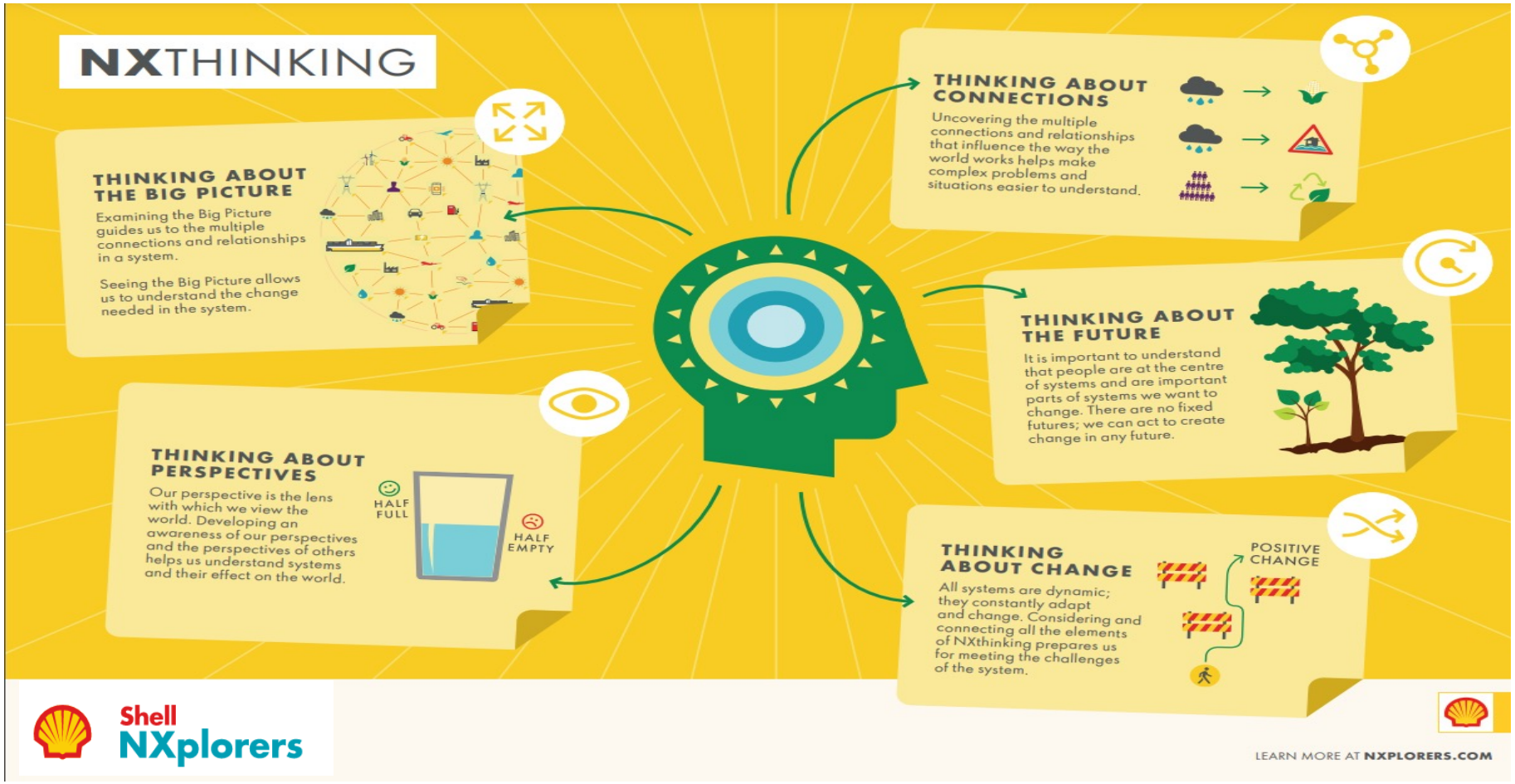


Shell NXplorers



What are some of the food, water, and energy problems or issues that affect our community?

NXPLORERS



"Equips young people with the tools to reimagine our world"

Utilizing the disciplines of Systems Thinking, Scenario Planning & Change Theory

Scaling-Up: Waters Foundation Systems Thinking Work Spreads Across the Country

and the 

Why Systems Thinking?

Lasting, impactful change occurs when we understand a system fully by asking

"What's happening and why?

What's working and why?

What isn't working and why?"

When we have the habits of thinking and tools to understand the system at a deep level, we are in much better positions to change the system to produce better outcomes and achieve desired results.

WHY SYSTEMS THINKING?

Makes Thinking Visual

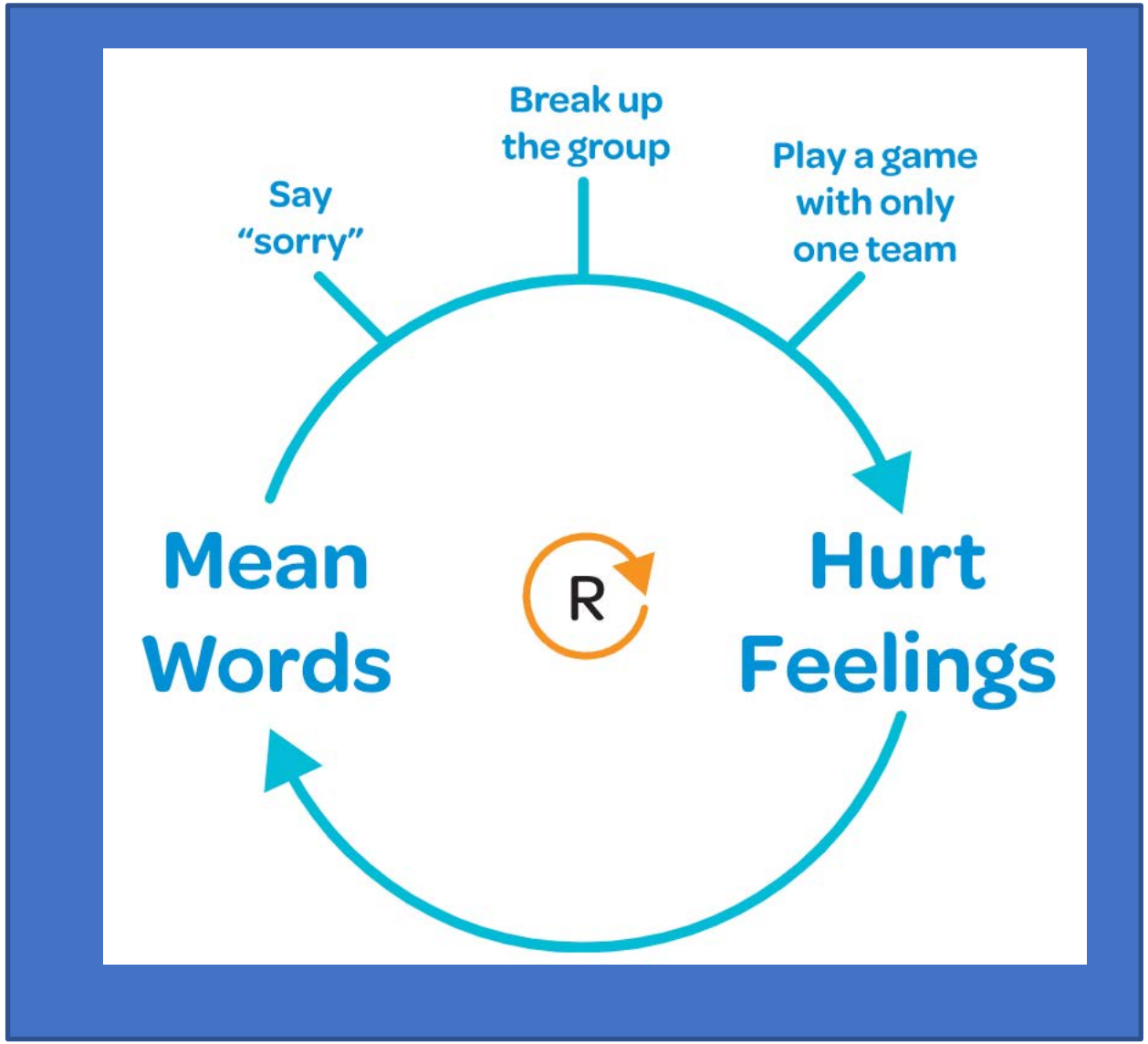
Organizes Thoughts

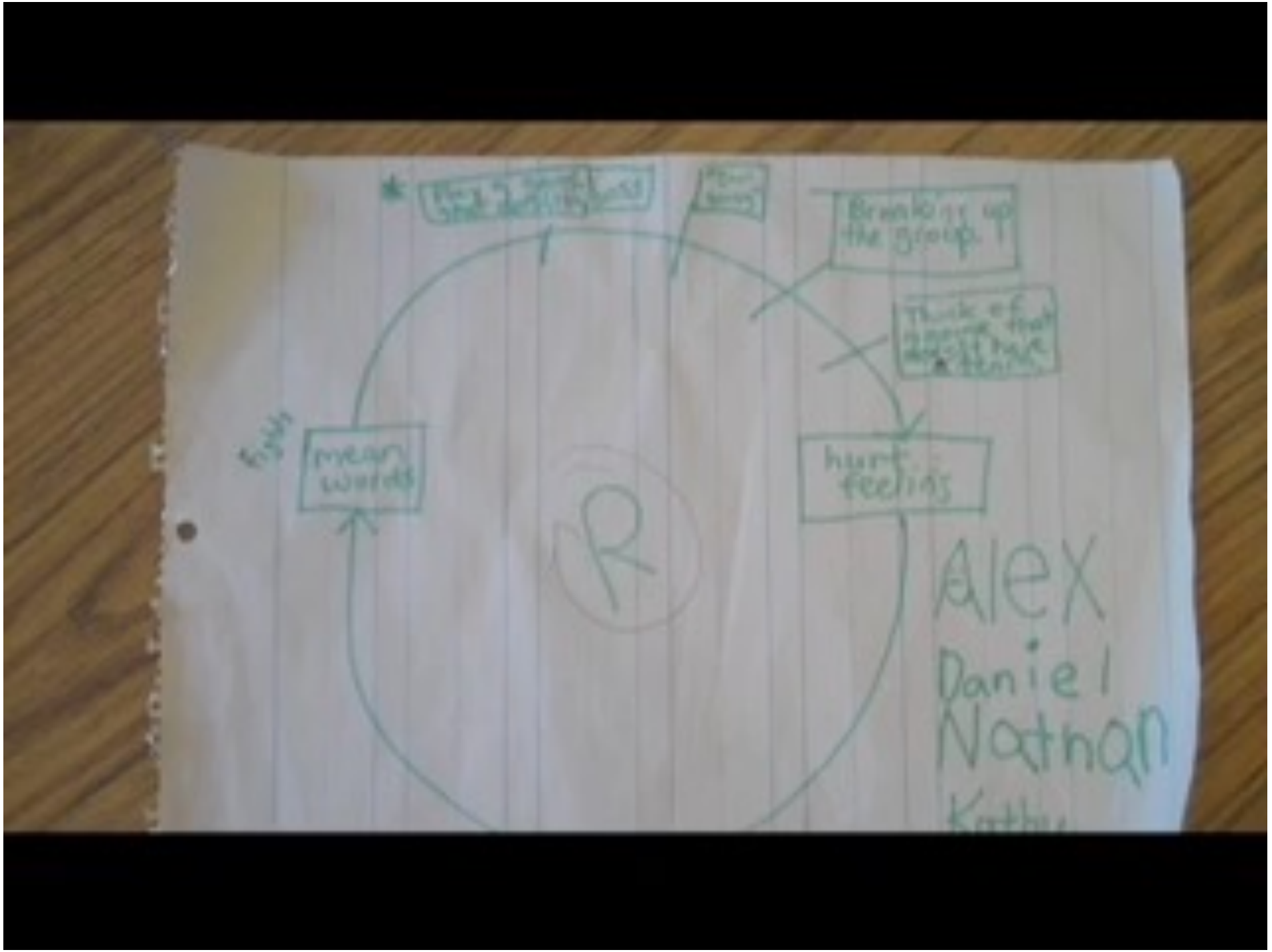
Changes Perspectives

Improves Communication

Systems thinking gives learners the tools to develop a deeper understanding of systems around them and move closer to achieving their highest performance. Systems thinkers have a sharpened and clarified understanding of how systems actually work. Confusing, disconnected snapshots of life start to make more sense when understood as interdependent patterns of change over time.

First grade (6-7 year old) Problem-solving




mean words
hurt feelings
Alex
Daniel
Nathan

July 22-26, 2013
Wake Forest University
Winston-Salem, NC

Camp Snowball 2013

Camp Snowball is a collaboration among:

www.CampSnowball.org


SUMMER 2012
CAMP
SNOWBALL
and CAMP SUNSHINE
TUCSON, ARIZONA USA


Camp
Snowball
PHILIPPINES
I take
ACTIONS
I adopt
BELIEFS
about the world
I draw
CONCLUSIONS
I make
ASSUMPTIONS

Waters Center
For Systems Thinking

waterscenterst.org

Online Learning Opportunities

Webinars

Monthly, one-hour virtual learning sessions on varying topics explored through a systems thinking lens

Online Workshops

Dig deeper into systems thinking with online workshops

Virtual Forums

One-day virtual forums focused on specific areas of interest that bring stakeholders from all parts of a system together

Credentialing Program

Designed for experienced systems thinkers who are interested in advancing their skills and capacities

Credentialing Program

OPEN STUDIO

In the Loop
News from the Waters Center For Systems Thinking

Thinking Tools Studio

Online Workshops

Workshop Options Customized For Your Needs

Gene Bellinger

Jacqueline White

Thomas Krynicki, Carlos Silva, & Miriam Naomi Spano

Demetria Joyce

Systems Snapshot *by the Waters Center for Systems Thinking*

Ronda N. Davis

Rocco Scolozzi & Stefano Armenia

Fitzroy Lewis

Alan Ticotsky

Building Pathways
for Systems Thinkers
EARLY CHILDHOOD FORUM

Building Pathways
for Systems Thinkers

REIMAGINING SCHOOL LEADERSHIP FORUM

Thursday, June 24, 2021

8:00AM - 3:30PM PDT ⊛ 11:00AM - 6:30PM EDT

A Virtual Forum for School Leaders

Building Pathways
for Systems Thinkers
HEALTH SYSTEM FORUM

Thursday, February 11, 2021

7:30AM - 2:00PM PST ⊛ 10:30AM - 5:00PM EST

A Virtual Event

Register by Jan. 28 for Early Bird Pricing, $99/person

"Every system is perfectly designed to produce the results it gets."
- Paul Batalden, M.D.

For some, the health system works perfectly. For many others, it doesn't. The Health System Forum, presented by the Waters Center for Systems Thinking, will create the space for important conversations about the current state of the health system and how systems thinking can help create a more inclusive, productive system with better outcomes for all.

Expected outcomes

Participants will:

- Come together with other health system stakeholders in order to represent and experience a whole-system approach
- Explore perceptions around the state of the health system
- Discover how the Habits and tools of systems thinking can be applied to create a more inclusive, productive and beneficial health system for all
- Hear examples from distinguished guest speakers of how the Habits and tools have already been applied in various healthcare settings
- Walk away with tools and approaches to break down silos throughout their network and beyond in order to make positive change
- Continue to build connections and systems thinking capacity through follow-up opportunities

Featured Speakers

Victor Garcia, MD
Pediatric Surgeon, Cincinnati Children's Hospital Medical Center
Professor of Surgery and Pediatrics, University of Cincinnati School of Medicine

Ami L. DeWaters, MD MSc
Assistant Professor of Internal Medicine
Assistant Director of Health Systems Sciences Education
Penn State College of Medicine

Jed Gonzalo, MD MSc
Professor of Medicine and Public Health Sciences
Associate Dean for Health Systems Education, Penn State College of Medicine

Nathaniel Johnson, MD
Clinical Assistant Professor, EM & Peds Faculty
College of Medicine, University of Arizona

Stephanie Starr, MD
Associate Professor of Pediatrics
Director for Science of Health Care Delivery Education, Mayo Clinic Alix School of Medicine

Terri Lee, MPH
Director, Office of Women's Health
Indiana State Department of Health

Amy Edgar, APRN, CRNP, FNP-C
Founder, Nurse Practitioner
Children's Integrated Center for Success

Michele Battle-Fisher, MPH, MA
Research Manager
Equitas Health Institute

Kathleen Swanson, DNP, RN
Assistant Professor of Nursing
School of Nursing, College of Health Professions, North Dakota State University

Timothy Ehlinger, PhD
Wm. Collins Kohler Chair
Director, Institute for Systems Change & Peacebuilding
University of Wisconsin - Milwaukee

Laura Hermanns, MSP
Assistant Director for the Center for Global Health Equity
Partnerships Coordinator for the Institute for Systems Change and Peacebuilding
University of Wisconsin - Milwaukee

Register now at healthsystem.wcfstevents.org

Each participant will be mailed a Forum toolkit full of resources and supplies to support learning during the event.

brought to you by Waters Center For Systems Thinking

Waters Center
For Systems Thinking

Tracy.Benson@waterscenterst.org
Mary.Quinnan@waterscenterst.org