TOGGLE Labs

NEW TO SYSTEMS THINKING?

Start Here — For K–12 Educators

WHAT TEACHERS OFTEN ASK

- "What is systems thinking?"
- "Why does it matter for my classroom?"
- "Can young children really do this?"
- "Where should I start?"

This quick guide offers clear answers, simple examples, and trusted resources you can use right away.

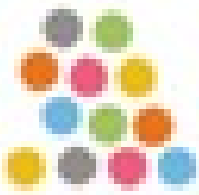
1. WHAT IS SYSTEMS THINKING?

Let's start with *What is a system?*

A system is made up of two or more parts that interact to form a whole, usually within some kind of boundary.

You can find systems everywhere:

- Concrete examples: a body, a family, a pond, a school.
- More complex examples: sibling rivalry, the food system, climate change — all networks of interacting parts.



This is heap

This is system

Systems thinking helps students (and us!) see how things connect, interact, and change over time, rather than looking at isolated parts.
It encourages a shift from:

objects → relationships
events → patterns
quick fixes → deeper causes

2. WHY IT MATTERS?

- Recognize feedback and change over time
- Strengthen confidence and agency in problem solving
- Communicate and collaborate through shared visuals
- Build empathy by seeing multiple perspectives

(In short, systems thinkers become better connectors, collaborators, and change-makers.)

3. CAN YOUNG CHILDREN "THINK IN SYSTEMS"?

- Children are natural pattern seekers
- Strengthen confidence and agency in problem solving
- Communicate and collaborate through shared visuals
- Helps children become able to connect and understand causes

4. WHERE TO START

Have you ever actually seen a system walking around? Probably not.
Systems become visible only when we imagine the connections among their parts.
That's where you come in. You can begin simply by asking:

- "How does this connect to that?"
- "Is this a heap or a system?"
- "What changes when these parts interact?"
- "What might happen next if one part shifts?"
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Try:
Comparing a pile of laundry (heap) with your body (system)
Using post-its or yarn to show connections in a story or ecosystem
Watching the PBS LearningMedia video What Is a System?
Asking students to identify systems in their classroom, family, or playground

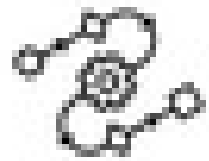
5. HOW IT FITS THE STANDARDS

Since 2013, the Next Generation Science Standards (NGSS) have named Systems and System Models as one of the seven Crosscutting Concepts connecting all sciences.

These concepts — patterns, cause and effect, systems and system models, and more — help students see recurring system features across disciplines.

Many educators now apply this lens beyond science, helping students notice system patterns in engineering, ecology, literature, history, and civics.

6. SYSTEMS THINKING ACROSS THE CURRICULUM

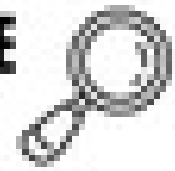


You don't need a new subject — just new questions.
Science: How do bees, flowers, water, and soil create a healthy ecosystem?
History: What interactions drove westward expansion?
Math: What feedback loop drives the growth of a savings account?
Language Arts: How do a character's choices set off a chain of reactions?
Social Studies: What happens in a community when one part changes?
Classroom Life: How do kindness or conflict grow through feedback within a group?
A few simple questions —

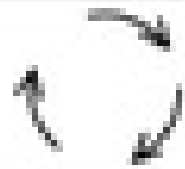
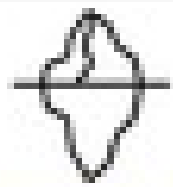
- "How does this connect to that?"
- "What might happen next?"
- "Who or what is affected?"

— can turn any subject into an exploration of systems.

7. TOOLS THAT MAKE THINKING VISIBLE



When students can see systems, they can think in systems.
A few powerful tools:

Tool	Helps Students…	Example
Connection Circles	Trace "what leads to what" relationships	
Behavior-Over-Time Graphs	Spot trends, delays, and feedback	
Causal Loop Diagrams	Explore reinforcing and balancing loops	
The Iceberg Model	Look beneath events to patterns and structures	

8. READY TO EXPLORE MORE

Resources I've Created

Audience	Resource	Resources
PreK-2	Apart, Together	A gentle story-based introduction to intergenerational themes.
K-3 & 6 Elementary	When a Butterfly Exposes	Uses familiar everybooks to uncover connections in a story of emergence.
Grades 3-6	Connected Wisdom	Story-based introduction to universal principles of living systems.
Grades 3-6	The Climate Change Playbook	22 experiential games that make roles, back, focus, and communication concepts clear.
All Grades / PD	PBS Systems Literacy Collection	Free videos, explore cycles explaining cases and attempts, hesitation of change.

9. OTHER RECOMMENDED RESOURCES

Around the world, more educators, schools, and organizations are weaving systems thinking into how children learn about the world and their place in it. Highlights include:

- **Waters Center for Systems Thinking** – Habits of a Systems Thinker and K-12 educator networks
- **The Cloud Institute** – Integrating systems thinking and sustainability across schools
- **Systems Thinking School (UK)** – Classroom-ready materials showing feedback and delay
- **AskNature.org (Biomimicry Institute)** – Nature-inspired systems for STEAM learning
- **Center for Education for Sustainability (CEL)** – Real-world sustainability practices
- **Project Drawdown / Eco-Challenge** – Systems-based climate solutions
- **DEAL (Doughnut Economics Action Lab)** – Adapting Kate Raworth's Doughnut for children
- **The Willow School (NJ)** – A whole-school model of systems thinking in action

JOIN THE CONVERSATION

Toggle Labs Kids — where educators, parents, students, and caring adults are growing the next generation of systems-smart thinkers.

Created by Dr. Linda Booth Sweeney, 2025