

# The Egg Mobile



Integrating Systems Thinking in  
Environmental Education

# Our Partnership

- Drumlin Farm Wildlife Sanctuary
  - Renata Pomponi, Visitor Education Coordinator
  - Kristen Scopinich, Education Manager
- Living Systems
  - Linda Booth Sweeney
- Creative Learning Exchange
  - Lees Stuntz

With generous support from  
the Gordon Brown Fund

# Drumlin Farm Wildlife Sanctuary



Mass Audubon's 232-acre environmental education center and wildlife sanctuary with a working sustainable farm in Lincoln, Massachusetts

# Drumlin Farm History

- Established in the early 1900s as the family estate of Louise Gordon Hatheway
- Educational mission began with Mrs. Hatheway's outreach to Boston children out of touch with farms and nature
- Donated to Mass Audubon in 1955 to be maintained as a working farm and education center



# Our Mission



- *Drumlin Farm Wildlife Sanctuary strives to promote awareness of the interdependence of people, land and wildlife through environmental education, stewardship of regionally significant habitat, and sustainable agricultural practices.*
- *By fostering an understanding of how our everyday choices affect the environment, we seek to inspire individuals, groups, and communities to develop and act upon their own conservation ethic in protecting the nature of Massachusetts.*

# People, Land, Nature

- 100,000 annual visitors
  - 75,000 self-guided
  - School Programs, Families, Children, Adults, Farm/Nature Preschool, Summer Camp, 4-H, Clubs
- Working Farm: Crops and Livestock
  - CSA, Markets, Farm Stand
- Wildlife Sanctuary
  - 232 acres of forest, fields, wetlands, farmland
  - Captive Native Wildlife, Stewardship of Habitats



# Our Audience

- Self-Guided Visitors
  - Typically adults with small children (preschool to age 10)
  - Looking for a fun outdoor experience
  - Focused on the animals
  - Interpretation available through signs and exhibits
- Guided Programs
  - Groups of 5-10 children (mostly K-5) led by a Teacher/Naturalist
  - 2-4 hour program
  - Detailed program objectives
  - Tied to MA curriculum standards
  - Interactive activities (farm chores, wildlife visit, habitat exploration, etc.)

# Our Audience (continued)

- Summer Camp
  - One- to two-week in-depth experience
  - PreK-grade 10
  - Led by counselors trained in farm and nature education
  - Extensive time for observation, exploration, contemplation
  - ACA certified program
- Drumlin Farm Community Preschool
  - School-year program with 20+ families
  - Ages 3-6
  - Daily outdoor exploration in addition to preschool classroom curriculum
  - MA certified program

# Core Principles and Practices for Environmental Education at Drumlin

- Place-based
- Interdependence
- Hands-on, Inquiry-Based
- Building conservation communities
- Agriculture and conservation are complimentary
- Making connections...



# Farm/Nature Connection



# Farm/Nature Connection

“It is the very complexity of the relationships between farm fields and hawks, pasture fences and wildlife travel, hayfields and grassland birds, people and food that challenge us to observe, understand, and steward our resources.”

*Drumlin Farm Strategic Plan, 2010-2015*

# Goals for Teaching About Connections

- See the big picture
- Identify patterns
- Grasp complexity
- Put *yourself* in the picture
- Think about (unintended) consequences

# How To Teach About Connections?

- Helping students understand connections is part of every Drumlin Farm program
- We do this well...but mainly through anecdotes rather than consistent frameworks
- Thinking deliberately about connections will enhance our programs AND give students a mental framework to take home and apply in other contexts

# Applying Systems Thinking

- 2009 grant from the Gordon Brown Fund to apply systems thinking to experiential environmental education
- High-level program goal:
  - Help our visitors and program participants begin to understand the deep and complex relationships between humans and the natural world
- Detailed program goal:
  - Create teaching guides and tools around specific farm/nature “connections”

# Moving Beyond Anecdotes: Applying System Thinking Tools

Anecdotal  
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Analytical



“Curious Conversations”

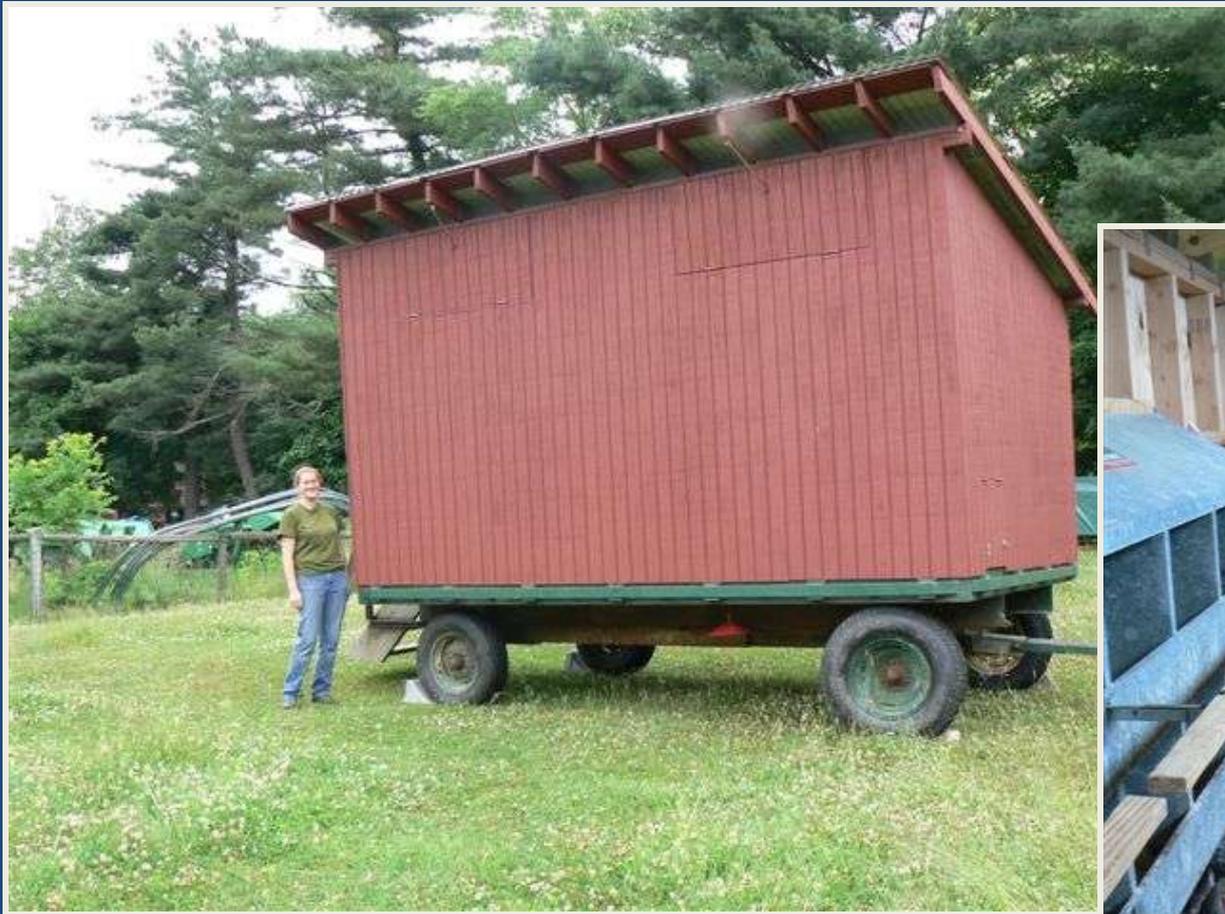
Interactive activities and games

Feedback loops

Stock/flow diagrams

Computer modeling and simulation (TBD)

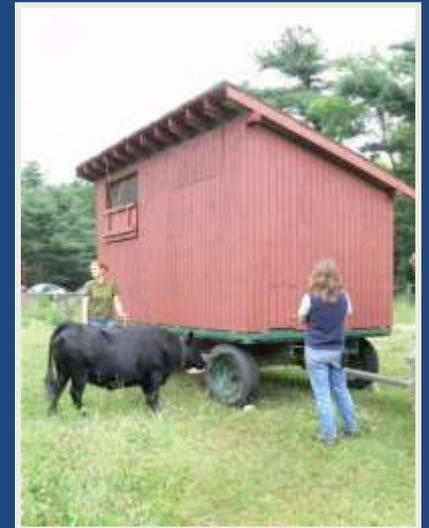
# Teaching About the Pasture System: The Egg Mobile!



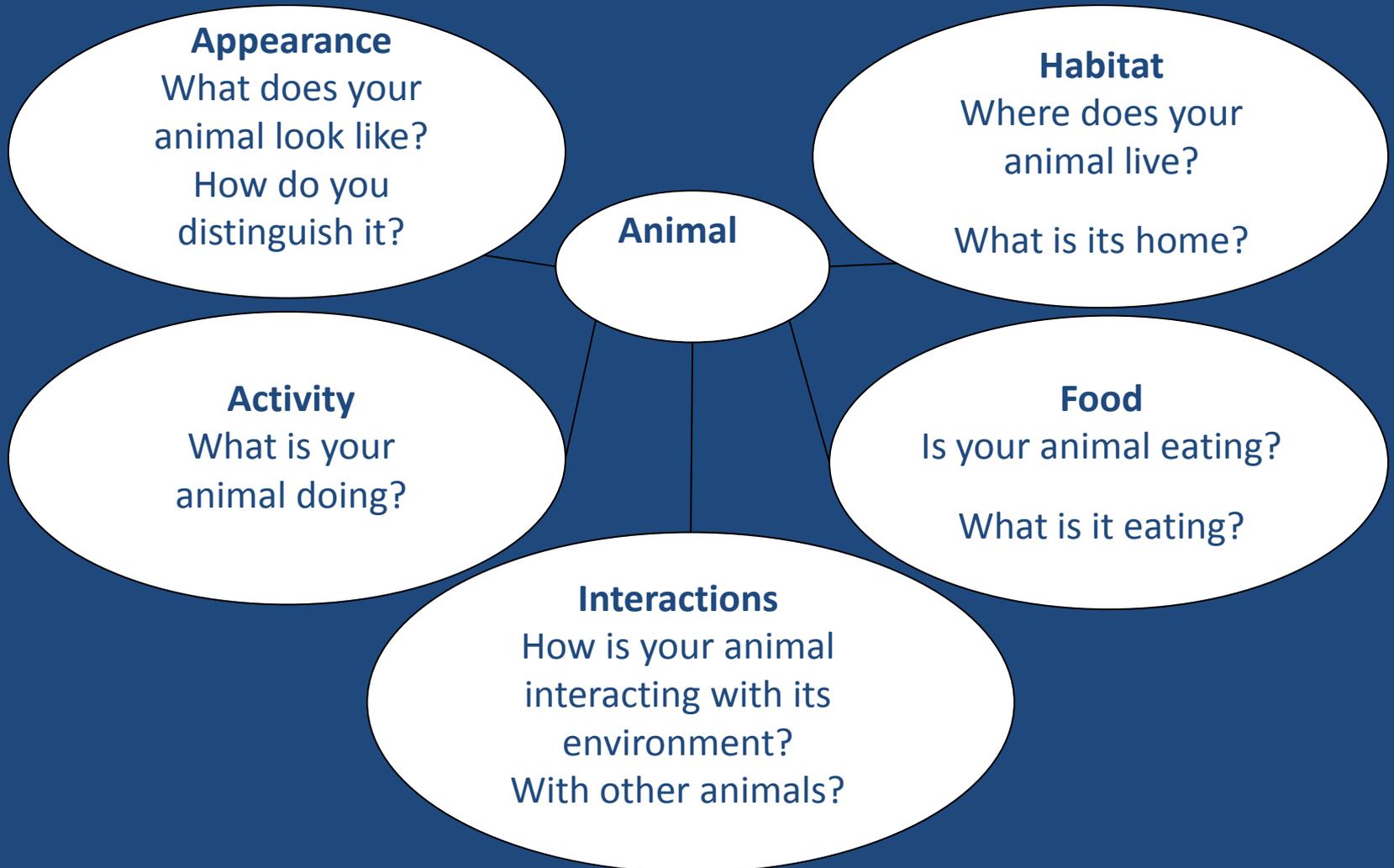
# Step 1: Get Excited!



# Step 2: Observe!



# Observation Worksheet



# Step 3: Guiding Questions

- How does the Egg Mobile work?
- Why would a farmer build an Egg Mobile?
- Does having the Egg Mobile here change the pasture in any way?
- Does the Egg Mobile help other animals on the farm?
- Is there any connection between the Egg Mobile and us (people)?

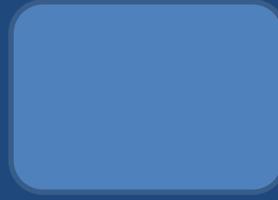
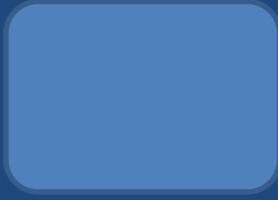
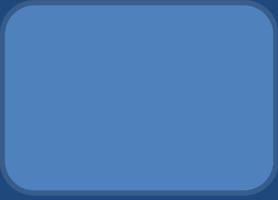
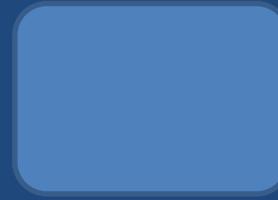
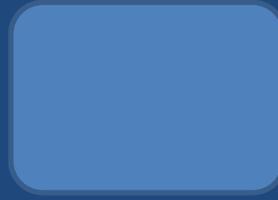
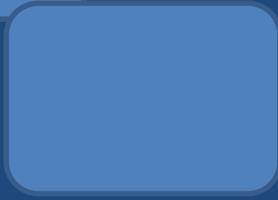
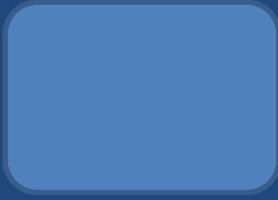
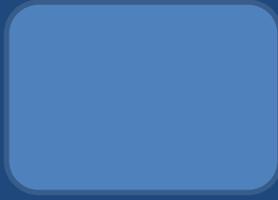
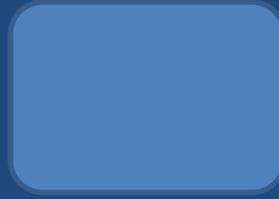
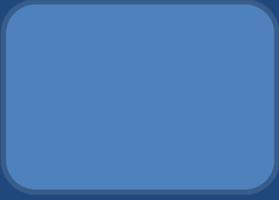
# How Does This Compare?



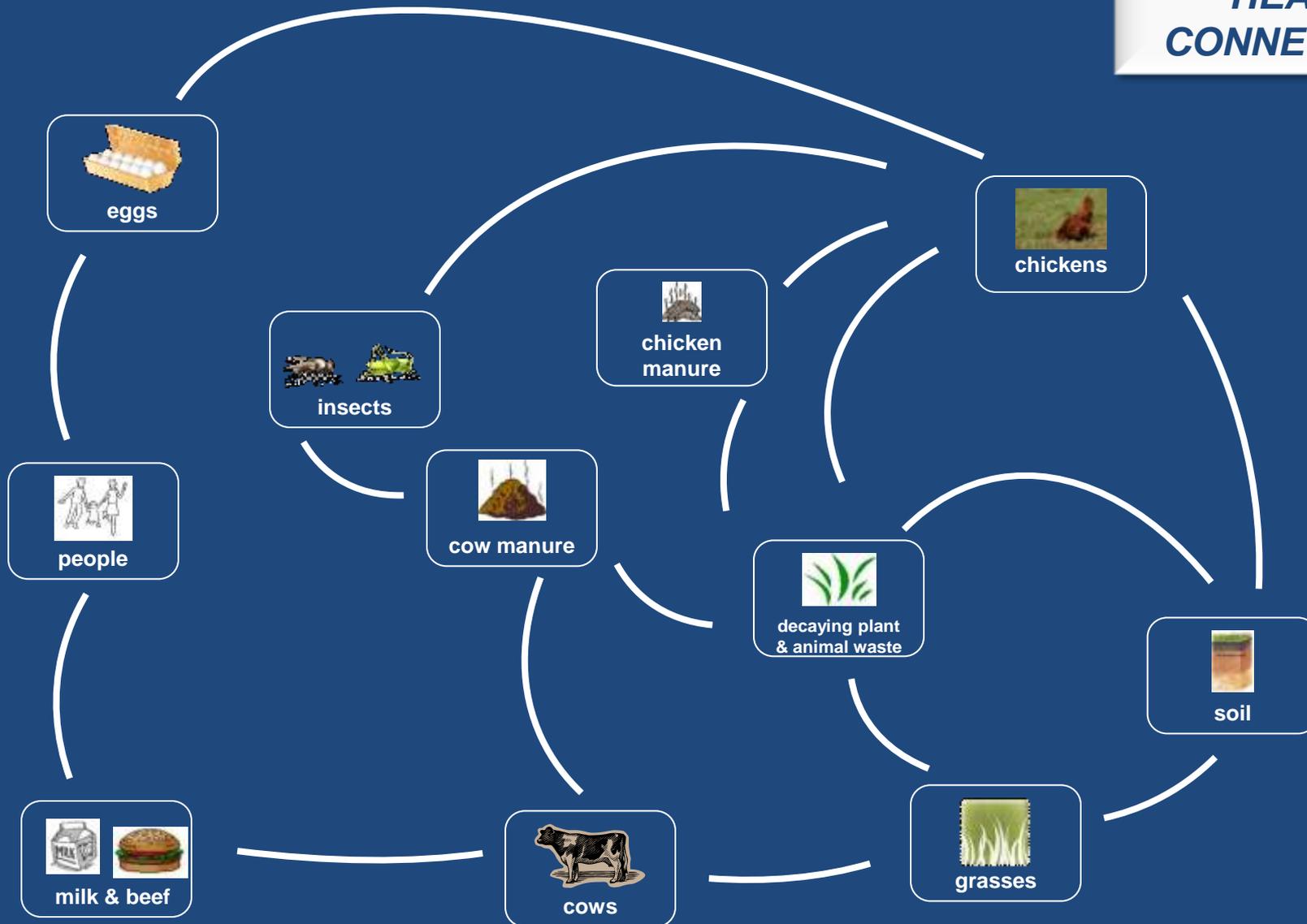
# Step 4: The Egg Mobile PlayKit

- Interactive “card game” to visually identify, form, and reform connections
- 14 playing cards (plus some write-in blanks)
- Colored Wikki Stix connectors
- Goal: identify the components of the Pasture System and understand how they connect

**PASTURE  
HEALTH  
COMPONENTS**



# PASTURE HEALTH CONNECTIONS

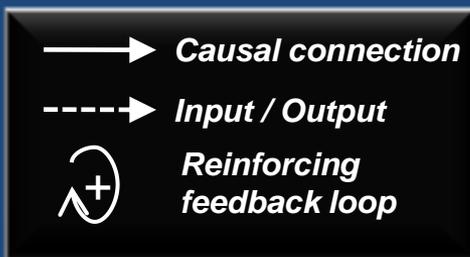
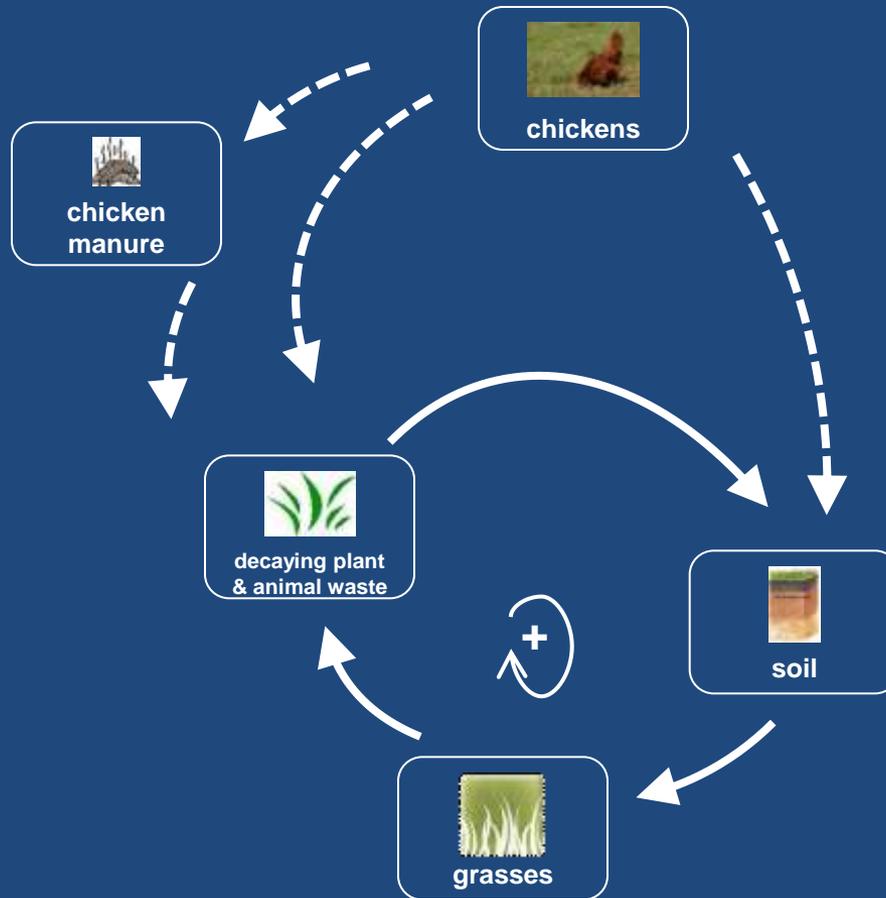




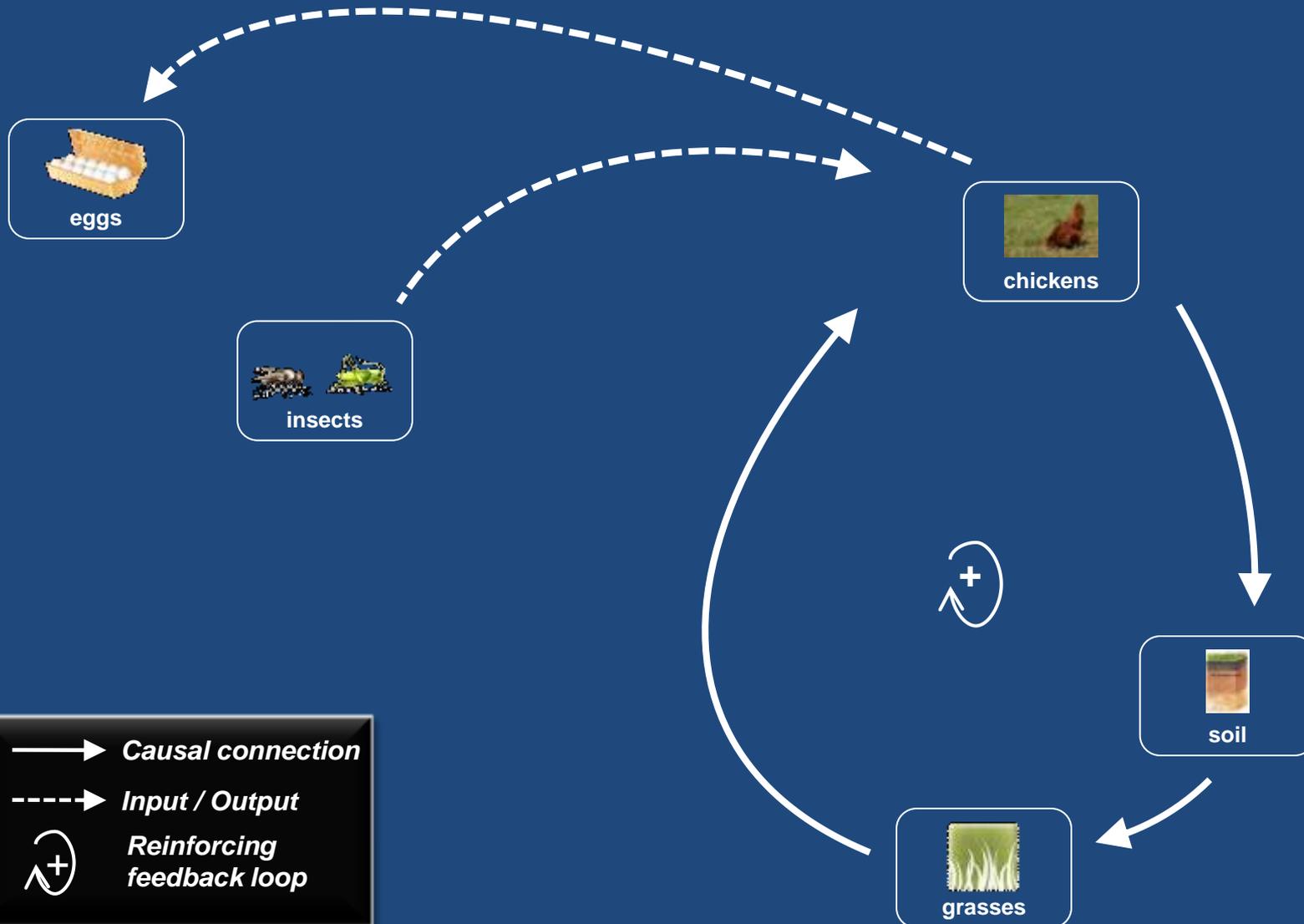
# Step 5: The Big Ideas

- Feedback Loops
- Stock/Flow
- System Disruptors
- Waste = Food

# Feedback Loop 1: Soil Health



# Feedback Loop 2: Chicken Health

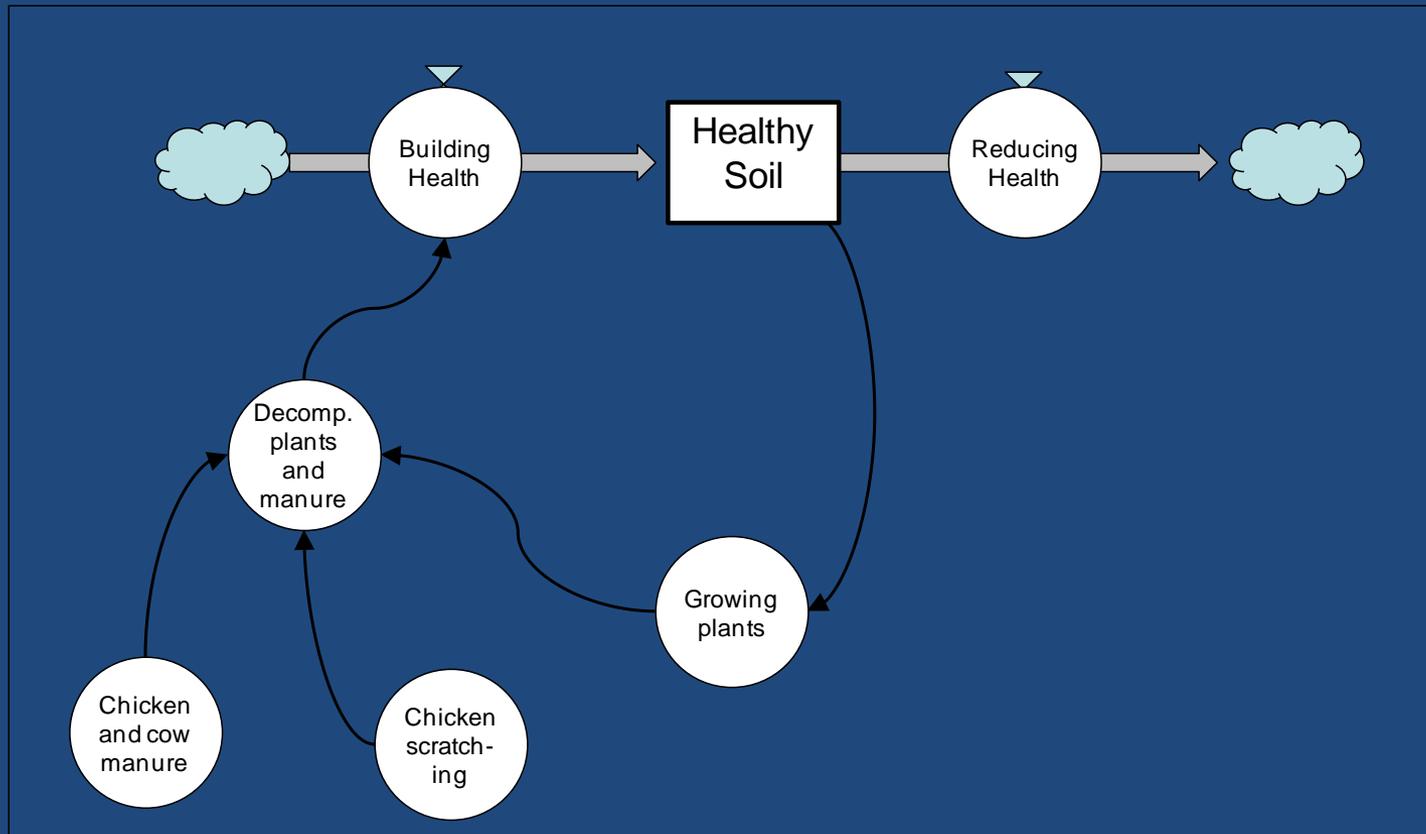




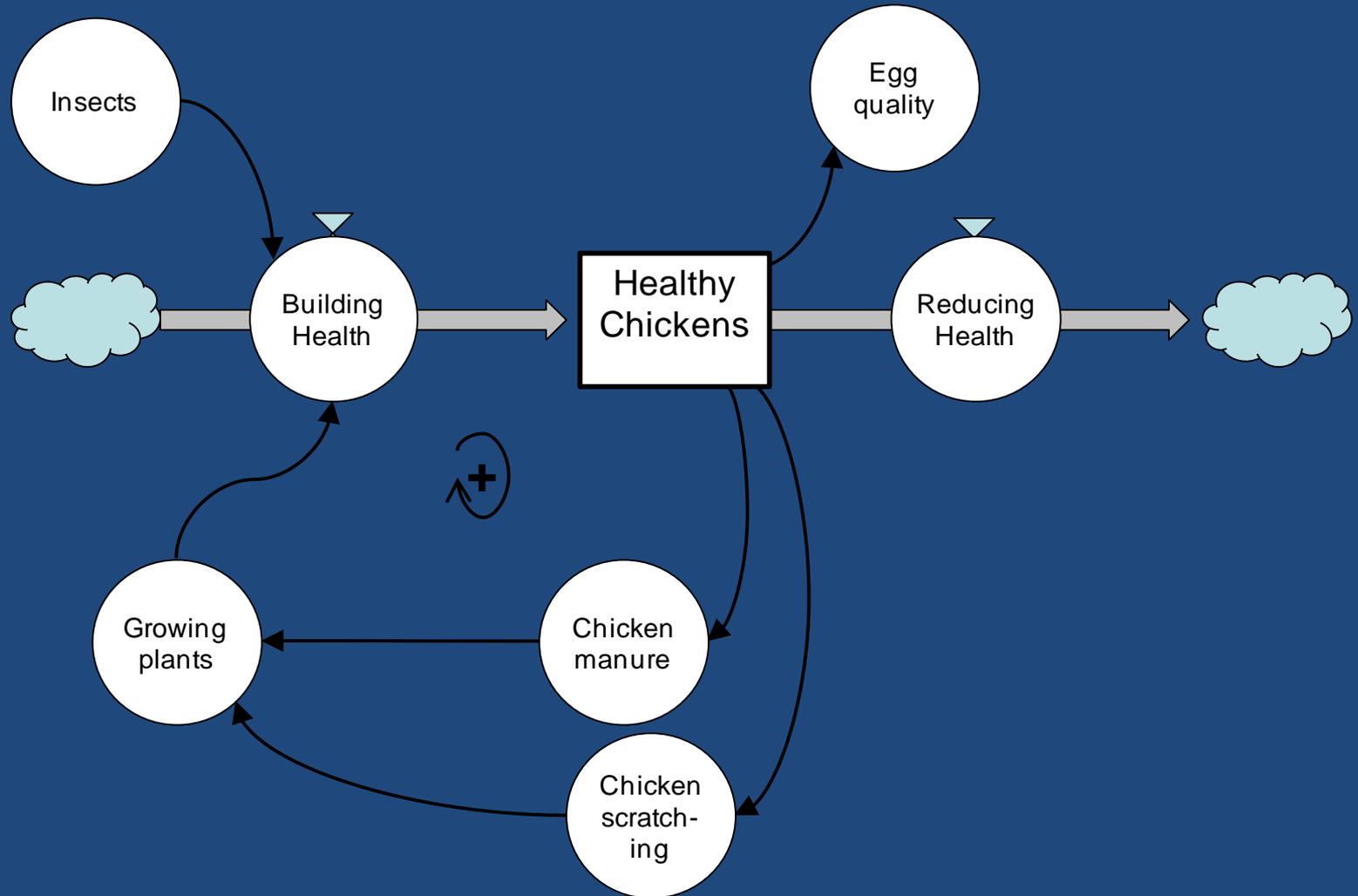
# Breaking the Connections

- What could push the healthy pasture system out of balance?
  - Pesticides used to control “weeds”...
  - Chickens in cages...
- How does the pasture interact with other farm habitats?
  - Impact of storm water runoff on adjacent wetlands

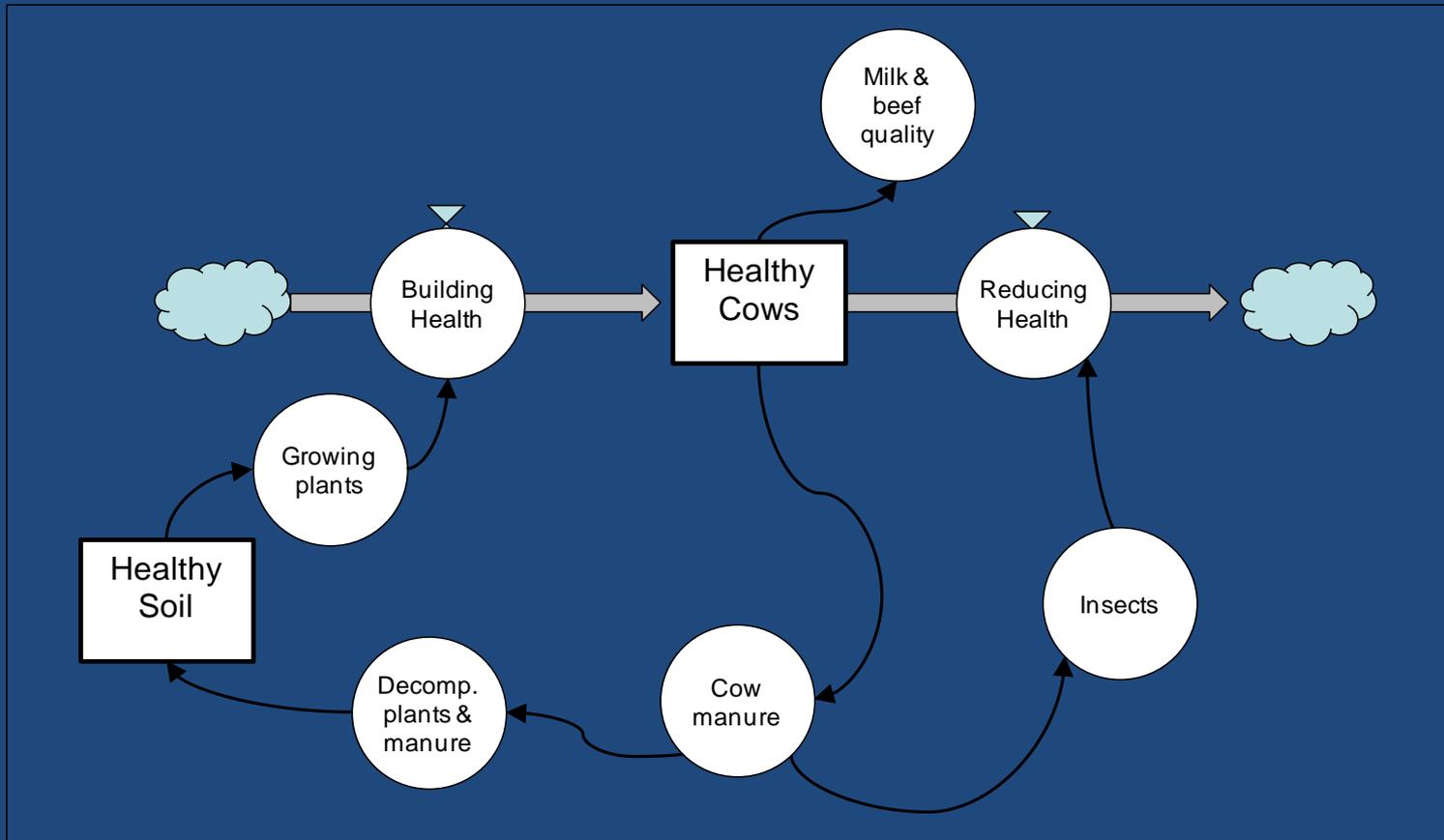
# Stock/Flow: Soil Health



# Stock/Flow: Chicken Health



# Stock/Flow: Cow Health



# Digging Deeper

- Age appropriate / time available extensions:
  - Visit to the Poultry House
  - Mural of the pasture system
  - Egg taste test (conventional, Poultry House, Egg Mobile)
  - Soil health game (gross motor activity)
  - Other games and activities outlined in teaching guide

# Early Results

- Field Test / Evaluation: February – April 2010
  - Drumlin Farm Community Preschool
  - February and April Vacation Week Programs
- Teacher Training: March – June 2010
  - Drumlin Farm Teacher/Naturalist Training
  - Summer Camp Staff Training
- Teaching Materials: In Production (July 2010)
  - Systems PlayKit
  - Egg Mobile Signage
  - Interactive Puzzle Game

# Want To Learn More?

- Drumlins Farm Wildlife Sanctuary  
<http://www.massaudubon.org/drumlin>



- Living Systems  
<http://www.lindaboothsweeney.net/>



- Creative Learning Exchange  
<http://www.clexchange.org/>



# Wrap Up: The Pasture Symphony

