

JUNE 25-JUNE 27, 2000

**STRATEGIES FOR AN INTEGRATED APPROACH TO
SYSTEMS THINKING AND DYNAMIC MODELING**

**Harriet Tubman Middle School
Waters Foundation - Systems Thinking and Dynamic Modeling**

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AGENDA

- **Introduction**
- **My Story**
- **Lesson Planning**
- **My Year Plan**
- **Clarity of Vision**
- **Power of Tools**
- **Multiple Experiences**
- **Activity**
- **Results Observed**

- **Goal - framework for integrating higher level thinking**
- **Reasoning - why I use ST/DM to get students to higher level thinking**

LESSON PLANNING

- **Blooms Taxonomy**
- **State Benchmarks/Standards**
- **ST/DM Concepts, Tools, Materials**

BEGINNING

BOTG – personal stories

Causal Loops –
relationships between
learning and classroom
structures

Stock/Flows Diagrams –
classroom structures,
student behavior
expectations

Theme – “conflict”. Using
tools to analyze text.

Animal Farm, levels of
oppression

Unit – Rwanda, Population
model, Infection model

MY YEAR PLAN

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MIDDLE

Rwanda, continued
Research Project -
medieval Europe,
feudalism

Use tools to express
learning.

Students do learning
groups and must teach
each other what they
know.

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Stock/Flows Diagrams – classroom structures, student behavior expectations
Theme – “conflict”. Using tools to analyze text. Animal Farm, levels of oppression
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Rwanda continued
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END

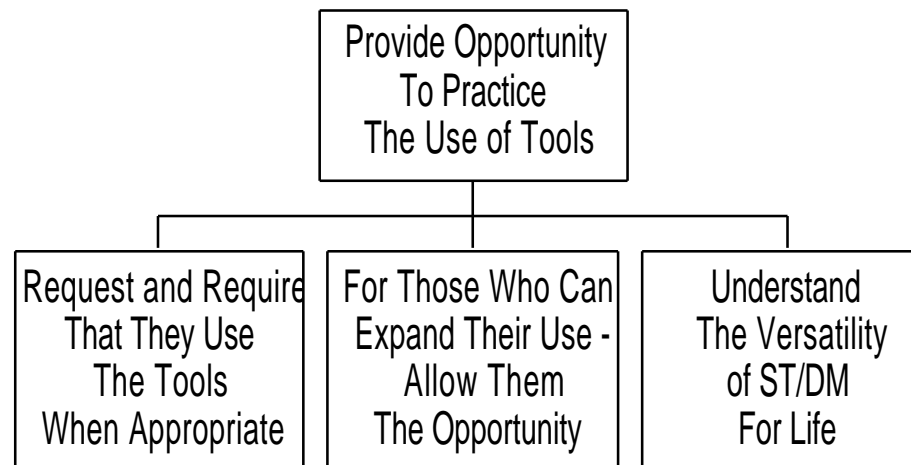
Rebellions and Revolutions- China, Civil Rights
Infection Model – China, Civil Rights, Japanese internment

CLARITY OF VISION

- **Have a clear picture of what you must address.**
- **Have a clear picture of what SD/DM tool you want to use and what you want it to accomplish.**
- **Have a clear picture of what you want students to experience/understand**

- **What tools can best achieve my purpose?**
- **What do I need to learn/understand about the ST/DM concepts in order to maximize effective use of the tools?**
- **What kinds of examples/practice will help me develop familiarity and skills with use of the tools?**
- **You can teach what you know.**

MULTIPLE EXPERIENCES



- **Study the tool and concept chart.**
- **Think of an area of your curriculum that would be addressed by the tools or concepts.**
- **Share your ideas with another person.**

TOOL	DEFINITION	EXAMPLES	POSSIBLE IDEAS
Webbing	Words arranged to represent understanding of relationships	<ul style="list-style-type: none"> • Relationships found in research on Bubonic Plague • Relationships perceived in story of US Civil Rights Movement 	
Iceberg Diagram	Explores thinking (patterns, structures, mental models) behind a situation	<ul style="list-style-type: none"> • Trends and relationships behind Japanese internment: <u>Farewell to Manzanar</u> • Trends and relationships behind the building of a revolution 	
Behavior Over Time Graph	Trends/patterns of behavior vs. discrete events	<ul style="list-style-type: none"> • student's personal story of learning, grades 3,4,5,6 • oppression changing over time in <u>Animal Farm</u> 	
Causal Loop Diagram	Causal relationships/ circular feedback	<ul style="list-style-type: none"> • Reinforcing nature of violent acts in Rwanda • Balancing potential of solutions 	
Stock/Flow Diagrams	Interdependencies/ accumulations	<ul style="list-style-type: none"> • What makes learning happen? • What makes rebellion happen? 	
Systems Archetypes	Classic storylines/ common patterns and structures	<ul style="list-style-type: none"> • growth of conflict preceding a war • escalating hatred and violent acts between groups of people - Rwanda 	
STELLA Computer Models	Dynamic modeling, simulating behavior of a system over time	<ul style="list-style-type: none"> • Infection model to show spread of idea, spread of revolution • Revolution Model to show how oppression can slow/stop the growth of a revolution 	
Role	Interactive decision-	<ul style="list-style-type: none"> • Feudalism 	

- **Students are more consistently engaged in their work.**
- **Writing is better because understanding is better.**
- **This process naturally gets students to higher levels of thinking.**
- **This process meets students at various levels and easily allows for deeper/higher extensions.**
- **This process address different learning styles.**

TO THINK ABOUT

- **You don't have to know it all to try - risk!**
- **Remember to have a "vision" and remember ST/DM is a tool to help accomplish your goals.**
- **Monitor and adjust**
- **Audience Comments/Questions**