Integrating Systems Thinking and System Dynamics

Innovation Academy Charter School
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Who We Are

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Mission Statement

To provide students with a challenging, interdisciplinary education that will prepare them for the 21st century through an emphasis on holistic learning, higher order and critical thinking skills, and practical application and integration of curriculum areas.
The Motto:
<table>
<thead>
<tr>
<th>Self-direction</th>
<th>Effective Communication</th>
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<tbody>
<tr>
<td><strong>Definition:</strong></td>
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<tr>
<td>Antonym: (opposite)</td>
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<tr>
<td>- Leaving things to the last minute</td>
<td>- Not telling others what you need to do your best</td>
</tr>
<tr>
<td>- Doing what others are doing even if it is a bad choice</td>
<td>- Not listening</td>
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<tr>
<td><strong>Examples:</strong></td>
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<tr>
<td>[Picture/illustration]</td>
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<th>Problem solving</th>
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<tr>
<td>- Leaving others out</td>
<td>- Giving up without asking for help</td>
</tr>
<tr>
<td>- Being busy</td>
<td></td>
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SYSTEMS CITIZENSHIP

IACS Four Social Outcomes

- Community membership
- Effective Communication
- Problem Solving
- Self-Directed Learning

Self-Directed Learning
Teaching Method

- Active
- Simulations
- Constructivist
- Inquiry
- Hands-On
- Team Work
- Learner Centered
Systems Tools

- **Behavior Over Time Graphs**
  - Simple
  - Show overall behavior

- **Feedback Diagrams**
  - Analytical
  - Trace causality
  - Two basic loops

- **Graphic Representations**
  - Iceberg

- **Stock and Flow Maps and Models**
  - Operational
  - Graphically display accumulations and rates
Tools We Can Use

BOTG
Connection Circle
Feedback Loop
Stock-Flow
Venn Diagram
Escalation
2 Column Notes
Book Ending
Iceberg

Inference
Chains
Cruelty & Hatred

I just wanted to say... how much I...
HATE you!
Friend or Foe?

Vey
- Modern Location
- Isabelle

"Cromack! Lightning struck a body; Nation slapped my face so hard it hurt. "Answer me, you miserable cow" (134) threw me to the ground" (33).
The Phantom Tollbooth

A tiny bit of what we insist on makes a fantasia uneasy.

Coming soon to own on DVD and Blue-Ray

Norton Juster
Jules Feiffer
Emily's Newspaper Model

Newspaper diagram
What other connections are there?
Articles --> people reading?
Readers --> writers joining?
Others connections? Are there other parts of the diagram to add?
Mexico Becoming a Destination for Immigrants

- Manufacturing Costs
- New Business
- Attractiveness to Foreigners
- Entrepreneurs
- Foreign Population
- Immigration
El Tempano

- Men get more job interviews, they think women aren't very useful.
- Hombres piensan las mujeres son para mirar y ellas no trabajan bueno.

- Men have done more difficult jobs.
- Suchras go to war.
- *En el pasado, mujeres tienen trabajos no más fuerte.
- *Las mujeres usualmente son las personas quién quita las hijas.
- Mujeres Tienen menos derechos.

- "Mujeres son estupidas."
- "Mujeres necesitan un hombre fuerte en su vida."
- "Women are lazy."
- Mujeres usualmente ama de casa.
- *Hombres solamente necesitan mujeres para bebés.
- *Mujeres no son Fuertes.
- "Mujeres no pueden hacer mucho."
- Mala educación.

Los hombres ganan más dinero que las mujeres.
El Témporo

Patrones.

- Hombres fort
- Hombres tienen más entrenados
- Sexismo
- Penetraron anticipadas

Underlying Structures.

- Mentalidad
- Antefallismo
- Mujeres tienen menos derechos
- Televisión representa mujeres estúpidas
- Historia. No trabajan mucho mujeres

- Educación
- Mujer baja
- Ama de casa
- Embarazada (no trabajar con fel)
- Malas/menos educación
- Prejuicio
- Mujer necesitan un hombre quique.
opportunities for women in China

education

increasing

foreign influence

decreasing

childcare

poverty
Models from Financial Literacy Class

Simple interest model

Demand model
Quick Facts: Credit Cards

1. According to the 2012 Federal Reserve Bank of New York’s Quarterly Report on Household Debt and Credit, the total balance of credit cards in the United States was $672 billion as of June 2012. This is the third largest debt type for Americans, preceded by mortgages and student loans.

2. According to the 2009 Survey of Consumer Payment Choice by the Federal Reserve Bank of Boston, 72.2% of consumers have a credit card, the average credit card user holds 3.7 cards, and 56% of credit card holders maintain a monthly balance.

3. College students are carrying particularly high credit card balances. A 2009 study by Sallie Mae, "How Undergraduate Students Use Credit Cards," noted the average credit card balance for undergraduates in 2009 was $3,173, with only 18% regularly paying off all credit cards each month. Seniors graduated with an average credit card debt of more than $4,100 and close to one-fifth of seniors carried balances greater than $7,000.

4. FINRA’s 2009 report, “Financial Capability in the United States,” notes that a staggering 36% of credit card users don’t know their interest rates.

5. According to the Federal Reserve's G.19 report on consumer credit, the average interest rate on all credit cards as of June 30, 2012 was 12.06%.

6. Morningstar’s research* suggests that an investor who first pays off a credit card and then saves for retirement, versus just making the minimum credit card payment, can potentially increase his or her 401(k) balance at retirement by 14.1%.

*Source: “Saving For Retirement? Start by Paying Off Your Credit Cards,” Morningstar white paper by David Blanchett, Head of Retirement Research, August 2012.

Example $5000 credit card balance. STELLA Portion is below.

- The monthly Payment is 1) $75
- 2) $100
- 3) $150

- The initial Debt is $5000
- Payments are calculated on a yearly basis. A yearly payment is 12*Monthly Payment

- Interest is calculated as Debt*Interest Rate
- Annual Percentage Rate for Interest is 17% or 0.17
Each graph represents different monthly payments:
1) 75
2) 100
3) 150

1) Paid off in 17.17 years at a cost of $15410
2) Paid off in 7.25 years at a cost of $8759
3) Paid off in 3.83 years at a cost of $6815