

Beyond Computer Basics

All-Ages Programs for Design,
Computational, and Systems Thinking
Presented by Emily Lynch and Daniel Tilton
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In this session

- Who
- What - LibraryLab & iPad Creativity
- Why - computational, design, systems thinking (handout!)
- How
- LibraryLab breakout!
- Q&A





Who can do these programs?

WHO

Daniel Tilton

Currently: supervising librarian

Previously: teen librarian, adult librarian

Experience with STEM before we started working together: none (except for library school)

Emily Lynch

Current: adult services librarian

Previously: teen services librarian

Experience with STEM: 1990's era web design & computer programming - very rusty!



WHAT

WHAT: iPad creativity

iPad Creativity Classes at The Seattle Public Library - workshops on digital painting, sculpture, and filmmaking that open new channels for creativity and self-expression while improving technological fluency.

- Painting on the iPad
- Digital Scrapbooking with iMovie
- Sculpting on the iPad

90 minute classes. Stand-alone or in a series. Draws on the strengths of iPads (which we happened to have) - visual media.





Seniors learn about mobile computing through app-based instruction

Painting a still life
on the iPad




WHAT: LibraryLab

LibraryLab at The Seattle Public Library - “a time for people of all ages to experiment, play, and create amazing inventions.”

Families come in, there are activities set up, staff greets and troubleshoots but is largely self-directed.

LibraryLabs include topics such as Coding without Computers, Coding Robots, Stop-Motion Animation, Snap Circuits, Amusement Park Science, Lego Disaster Island, Puzzle Rooms, etc.





5000

Just in our part of the city, our team of librarians and library associates has run over 200 programs reaching nearly 5000 attendees.



Our very first LibraryLab, out on the public floor. We learned about the Mars Rover and designed our own.



Kids completed a design process to create this stop motion video



Practicing systems thinking at a chain reactions program

Learning systems thinking with snap circuits





A recent "gizmos and gadgets" LibraryLab

WHY?

WHY: technological literacy for adults



- Traditional instruction becoming stale
- Technological change accelerating
- Need to teach transferable skills (computational, design, systems thinking)

WHY: escalator program for youth



- missing middle in programming between STEM storytimes & teen digital media programs
- limited staffing at small branches, needed new model

Why Computational Thinking?

- Great way to teach problem solving
- Career readiness
- Teach critical thinking about technology and information we consume daily
- Fun!





Computational thinking: coding without computers

Here today: Computational Thinking

Coding Board Games (“Coding Without Computers” or “STEM Board Games”)

Code & Go Robot Mouse

Dash robots



Why Design Thinking?

- Different but related approach to problem solving
- Audience/human oriented
- Collaborative process
- Self expression
- Make pretty things
- Fun!





Design thinking Tall tower challenge



Here today: Design Thinking

ArtRage (\$5 app)

Keva planks (50 block challenge)

Stop motion animation (free app) + storyboarding & filmmaking design process



Why Systems Thinking?

- Yet another (but related) way to teach problem solving and critical thinking
- We interact with systems all of the time (transit, schools, OS, Dewey, racism, monetary, ecosystems, libraries)
- Important leadership skills





Systems thinking: watershed restoration

Here today: Systems Thinking

Snap circuits

Ecosystems apps from PBS Kids

Gears gears gears

Bullying Toolkit





HOW

How?

- What do you have laying around?
- What skills & resources do you have?
- What skills can you learn?
- We will show you!





LibraryLab Time!

Q&A

Questions?
Thoughts?
Challenges?
What are you doing?

Thanks for
coming!

Reach us any time at

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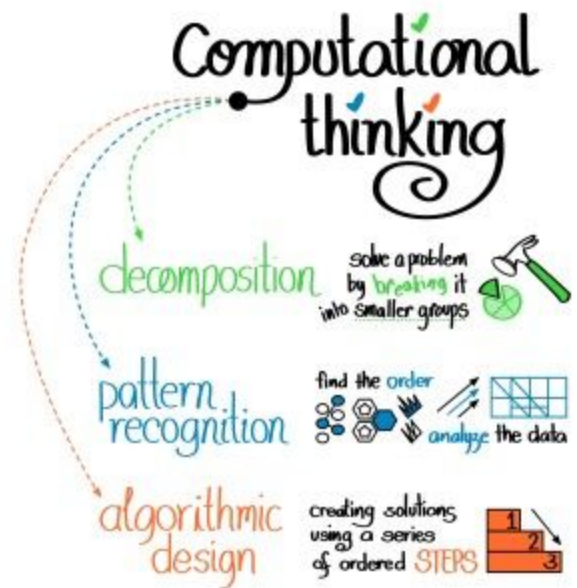
Beyond Computer Basics: All-Ages Programs for Design, Computational & Systems Thinking

Prepared by librarians from The Seattle Public Library for OLAWLA 2019

Computational Thinking

“Computational thinking (CT) is a problem-solving process that includes (but is not limited to) the following characteristics:

- Formulating problems in a way that enables us to use a computer and other tools to help solve them.
- Logically organizing and analyzing data
- Representing data through abstractions such as models and simulations
- Automating solutions through algorithmic thinking (a series of ordered steps)
- Identifying, analyzing, and implementing possible solutions with the goal of achieving the most efficient and effective combination of steps and resources
- Generalizing and transferring this problem solving process to a wide variety of problems”



Sources:

<https://education.ohio.gov/Media/Extra-Credit-Blog/November-2016/GUEST-BLOG-What-is-Computational-Thinking-and-Why>

<https://www.iste.org/explore/Solutions/Computational-thinking-for-all>

Systems Thinking



Sources:

<https://blog.samihonkonen.com/helping-kids-learn-systems-thinking-1713a7e9e7c3>

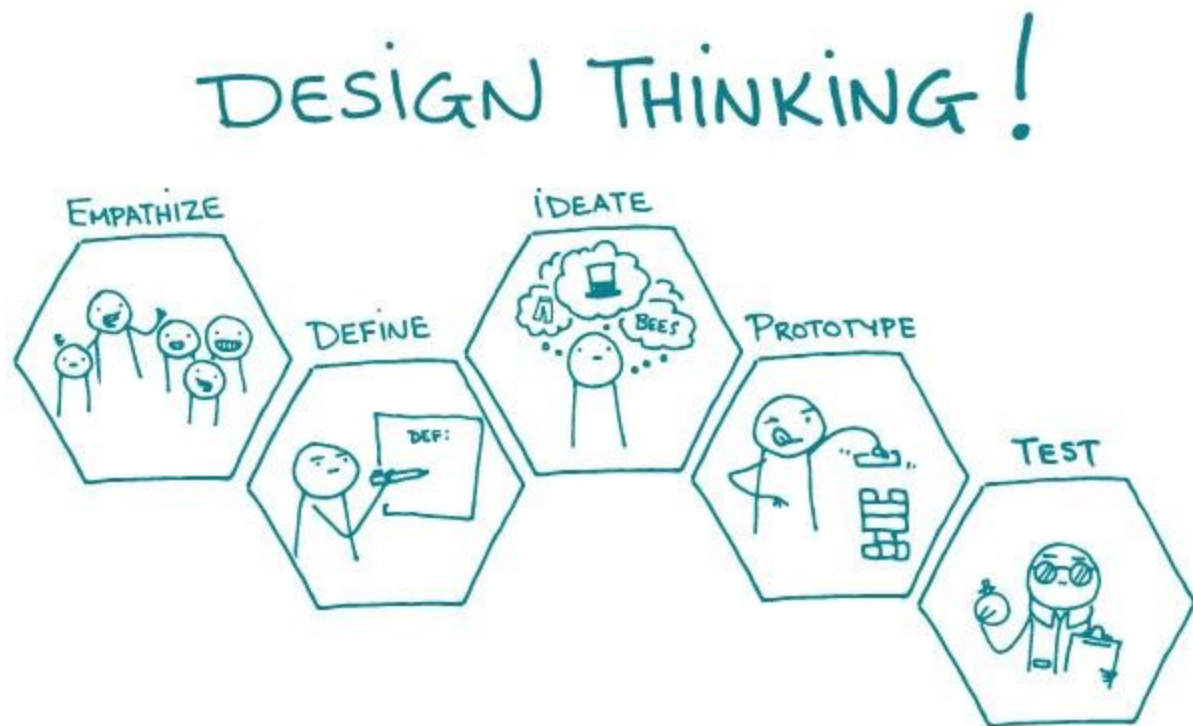
https://serc.carleton.edu/integrate/teaching_materials/systems.html

http://educators.brainpop.com/wp-content/uploads/2014/07/IOP_QDesignPack_SystemsThinking_1.0.pdf

<https://www.edutopia.org/video/students-break-system-bullying-english-class>

Design Thinking

“Design Thinking is a mindset and approach to learning, collaboration, and problem solving. In practice, the design process is a structured framework for identifying challenges, gathering information, generating potential solutions, refining ideas, and testing solutions. Design Thinking can be flexibly implemented; serving equally well as a framework for a course design or a roadmap for an activity or group project.”



Sources:

<https://tll.gse.harvard.edu/design-thinking>

<https://medium.com/@tigranbs/design-thinking-for-software-developers-bbd2f863c6f7>

<https://youtu.be/RECB628s004> - KidsTeam UW on cooperative design

Library Lab at OLA + WLA 2019

Computational thinking:

- [Coding Board Games](#)
- [Code & Go Robot Mouse](#)
- [Ozobots](#)
- [Dash Robot](#) + iPad



Systems thinking:

- [Snap Circuits](#)
- [Ecosystems games from PBS Kids](#)
- [Gears Gears Gears](#)
- [Bullying Toolkit](#)



Design thinking:

- [ArtRage](#)
- [Keva Planks](#)
- [Stop Motion Animation](#)

