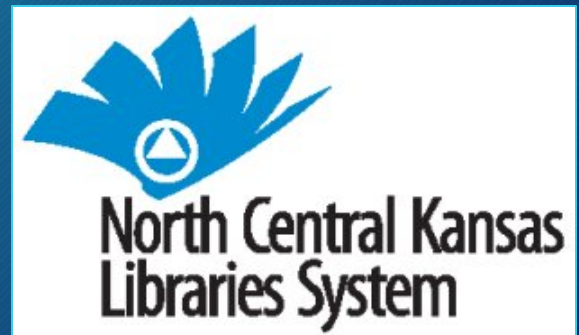


# Makerboxes

Maker Programs in a Box

~ Melendra Sutliff Sanders

#makerboxes



# Things to Consider

- What needs are there within the programming that's already being offered, and how will these mobile makerspaces fill them?
- What definition of mobile are you using? Mobile in that the materials will go to the teens in kits, or mobile in that the technology will move to them (like tablets)?
- What broad library goals are these makerspaces addressing?
- What specific goals are you/your department expecting these makerspaces to accomplish and how will they be measured?
- How big can your makerspaces be? Where will they be housed? Are they going to be shared between locations?
- Will your makerspaces be available for checkout to the general public? Will they be available for checkout to teachers or other educators?
- How are you going to move them? How are they going to be secured?
- What resources will be consumed within the makerspaces and how will they be replenished?
- How are you going to fund them initially? How are you going to keep up with funding?

From Teen Services Underground at [www.teenservicesunderground.com/mobile-makerspaces/#more-5592](http://www.teenservicesunderground.com/mobile-makerspaces/#more-5592)

# Why Makerboxes?

## System Goals:

- Exposure and experimentation
- Master new skills
- Increase programming
- Partnerships

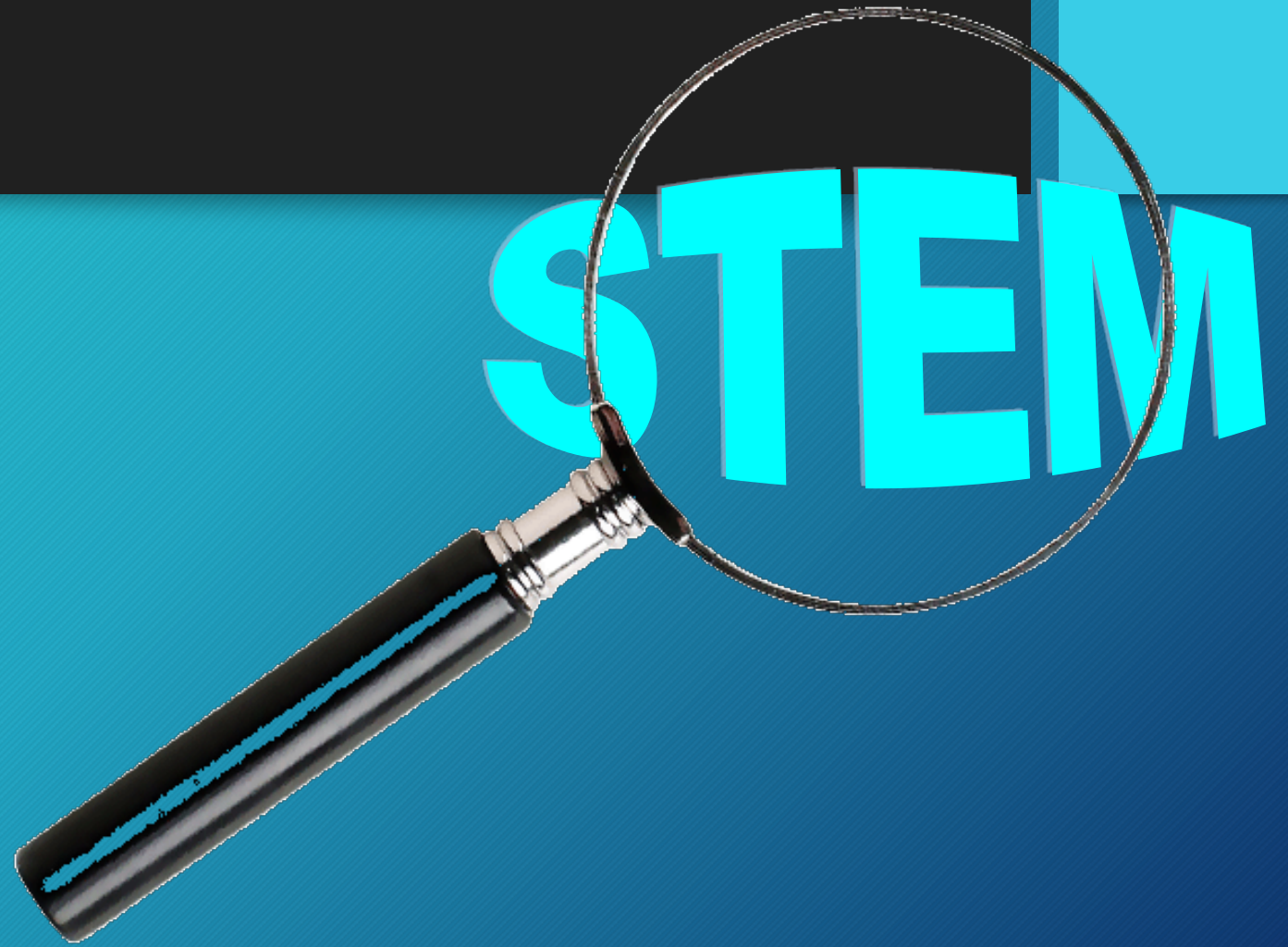
## Limitations:

- Budget
- Durability
- Ease and flexibility of use



# Finding Focus

- Defining Maker
  - Arts & Crafts?
- STEM
- Makerbox Themes



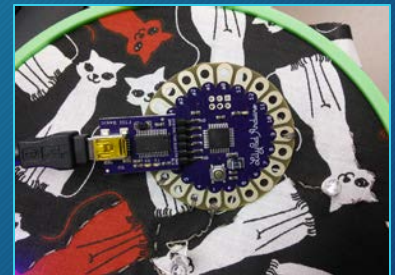
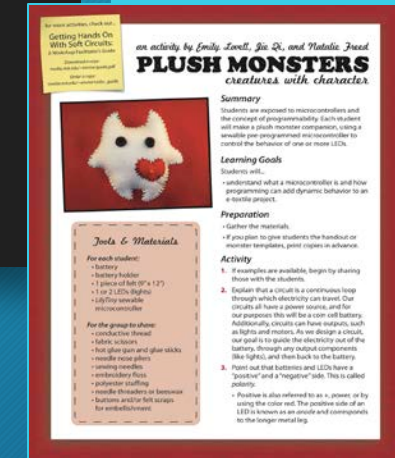
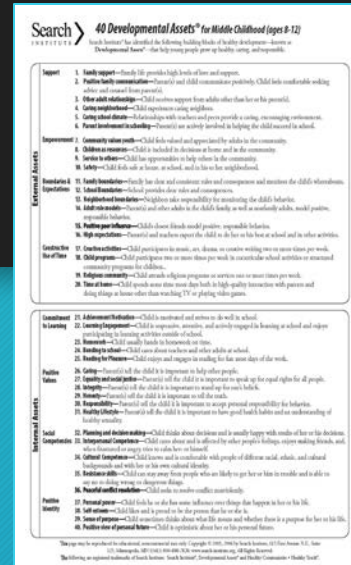
# My Makerboxes

- Robots
- Circuits
- Solar
- Mini Weapons
- Builder
- Repurposing Books
- 2 Photo Booth
- Break It reMake It
- 4 LEGO



# All Makerboxes Include

- Books
- Projects to make
- Supplies to make projects
- Program Activities & Ideas for additional projects
- 40 Developmental Assets for Middle Childhood & 40 Developmental Assets for Adolescents
- Documentation



# Program Activities & Ideas

## Activities on the Computer

Simple Make a Robot websites

[www.kanogames.com/build/robot](http://www.kanogames.com/build/robot)

[www.abcya.com/make\\_a\\_robot.htm](http://www.abcya.com/make_a_robot.htm)

[www.konstruktorz.com/create](http://www.konstruktorz.com/create)

Build a Robot and Test it on simple tasks

Wonderville Robot Factory: [www.wonderville.ca/asset/robot-factory](http://www.wonderville.ca/asset/robot-factory)

Robot Related Computer Games

Robot vs. Alien game:

[www.luckygamez.com/kids/play1391#.UssNwfRDu5J](http://www.luckygamez.com/kids/play1391#.UssNwfRDu5J)

Escape from Robotron game:

[www.luckygamez.com/kids/play1496#.UssOEPRDu5I](http://www.luckygamez.com/kids/play1496#.UssOEPRDu5I)

Short Robot Videos

Robot Horse: [www.youtube.com/watch?v=YEzNJ9Ttsjs](http://www.youtube.com/watch?v=YEzNJ9Ttsjs)

Kangaroo: [www.youtube.com/watch?v=\\_4luJ0ZSgy8](http://www.youtube.com/watch?v=_4luJ0ZSgy8)

Flipping Pancakes: [www.youtube.com/watch?v=W\\_gxLKsSsIE](http://www.youtube.com/watch?v=W_gxLKsSsIE)

Stacking: [www.youtube.com/watch?v=v9oeOYMRvuQ](http://www.youtube.com/watch?v=v9oeOYMRvuQ)

ArtBots: [www.youtube.com/watch?v=VnL4222gtWc](http://www.youtube.com/watch?v=VnL4222gtWc)

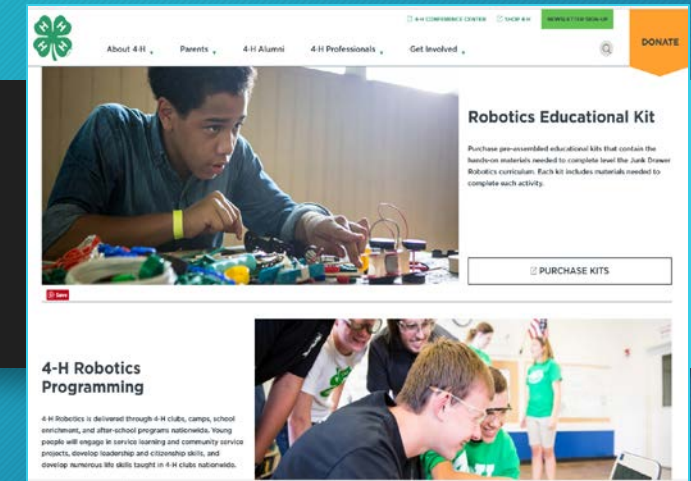
Other Ideas

Watch Wall-E

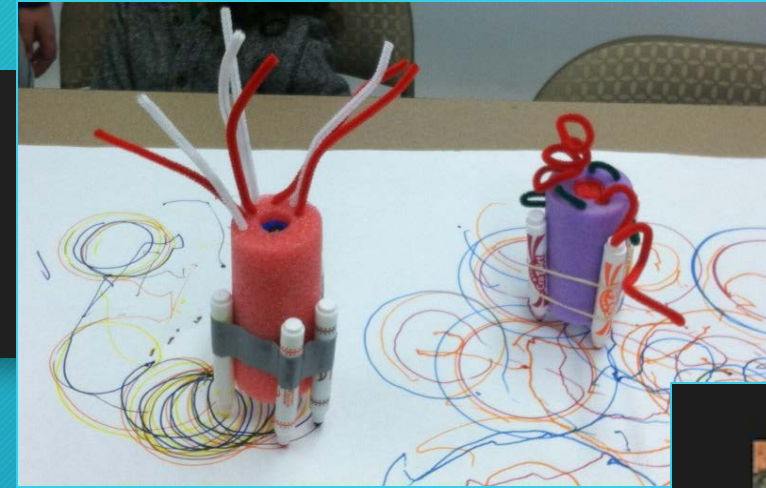
Cereal Box Robots

Make ArtBots

Make a Mini-Robot



# Program Activities & Ideas



## Building Non-Kit Robots

4H Robotics Curriculum: <http://4-h.org/parents/curriculum/robotics/>

Boy Scouts Robotics: [http://www.scouting.org/filestore/Merit\\_Badge\\_ReqandRes/Robotics.pdf](http://www.scouting.org/filestore/Merit_Badge_ReqandRes/Robotics.pdf)

diyready: <http://diyready.com/how-to-make-a-robot/>

Instructables: <http://www.instructables.com/howto/robots/>

Let's Make Robots: <http://letsmakerobots.com/>

Make: [https://makezine.com/page/1/?s=robot&post\\_type%5B0%5D=projects#038;post\\_type%5B0%5D=projects](https://makezine.com/page/1/?s=robot&post_type%5B0%5D=projects#038;post_type%5B0%5D=projects)

Popular Mechanics: <http://www.popularmechanics.com/technology/robots/a7388/build-your-first-robot/>

Science Buddies: <http://www.sciencebuddie.org/blog/2015/04/how-to-do-robotics-at-home-with-your-kids.php>

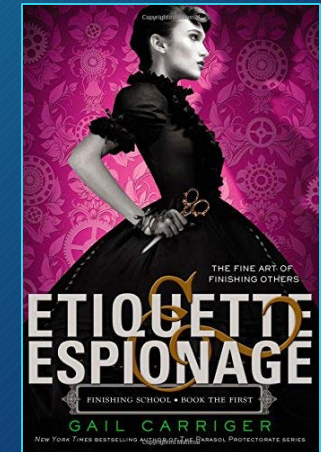
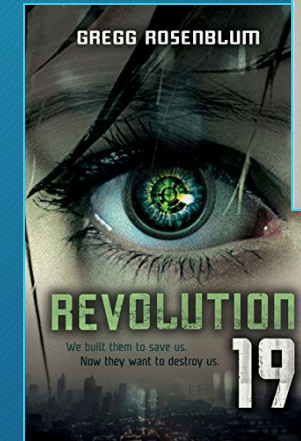
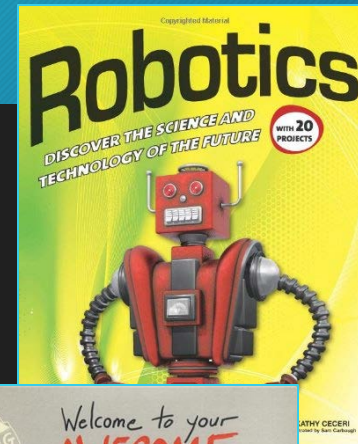
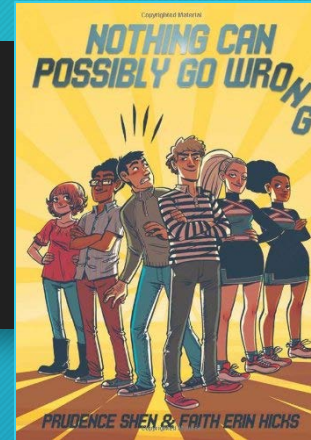
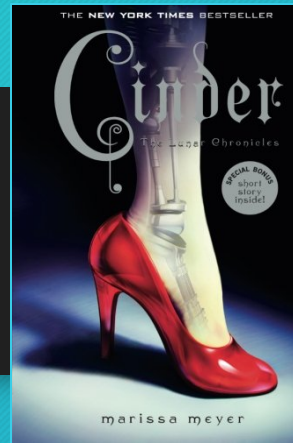
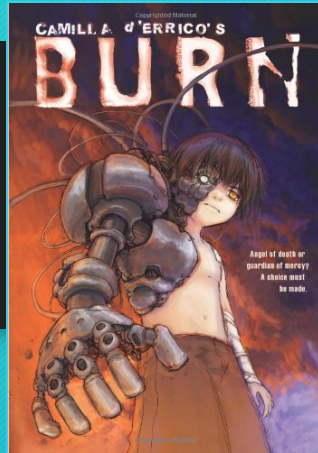




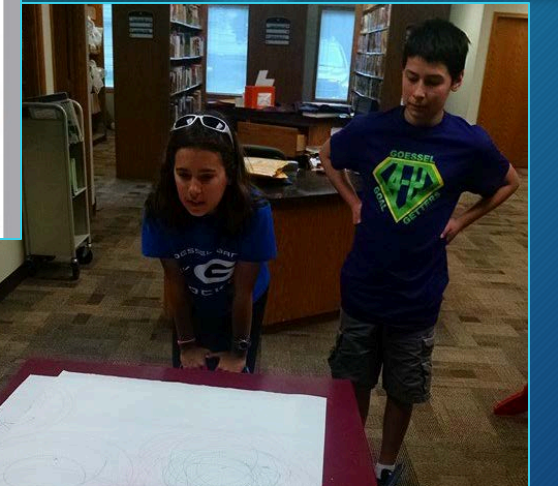
# Robots

- Books:

- *Nothing Can Possibly Go Wrong* by Prudence Shen
- *Welcome to Your Awesome Robot* by Viviane Schwarz
- *Mila 2.0* by Debra Driza
- *Etiquette & Espionage* by Gail Carriger
- *Revolution 19* by Gregg Rosenblum
- *Cinder* by Marissa Meyer
- *Camilla D'errico's Burn* by Camilla D'errico
- *Robotics: Discover the Science & Technology of the Future with 20 Projects* by Kathy Ceceri



# Robots = \$196.91



## • Projects:

- Make: SpinBot
- Smithsonian: Robo-Spider
- OWI: 7 in 1 Space Fleet
- 4M: Techno Robot
- 4M: Box Robot

## • Supplies:

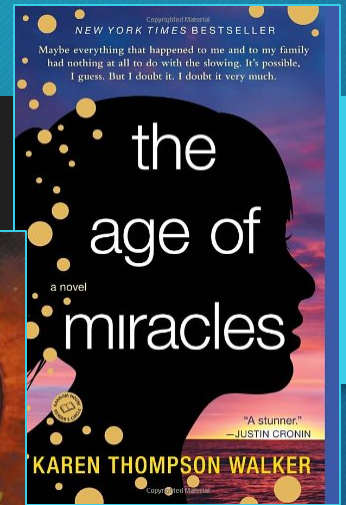
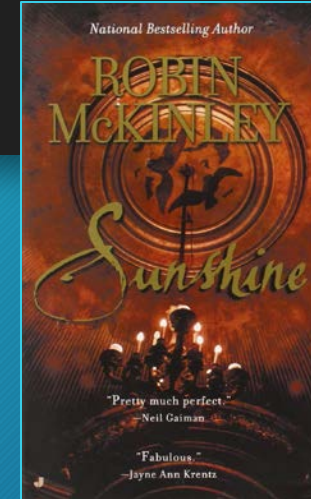
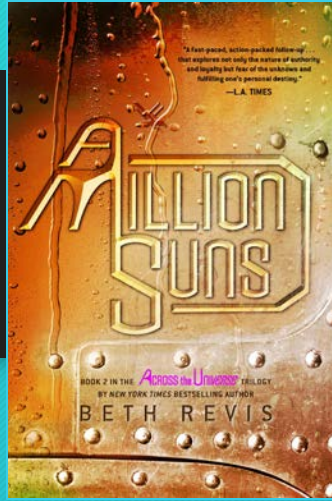
- Batteries
- Scissors
- Wire Cutter
- Screwdriver
- Double-Sided Tape
- Travel Bin



# Solar

- Books:

- *A Million Suns* by Beth Revis
- *Every Soul a Star* by Wendy Mass
- *Sunshine* by Robin McKinley
- *The Battle of the Sun* by Jeanette Winterson
- *Black Hole Sun* by David Macinnis Gill
- *Sun and Moon, Ice and Snow* by Jessica Day George
- *The Age of Miracles* by Karen Thompson Walker



Solar = \$226.15



• Projects:

- Greenex Solar Eco-House
- Solar Deluxe Educational Kit
- Thames & Kosmos Solar Mechanics
- SNAP Circuits Green
- Solar Oven

• Supplies:

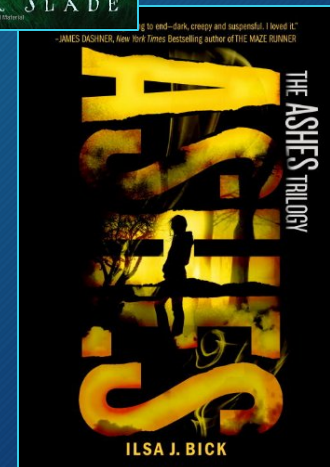
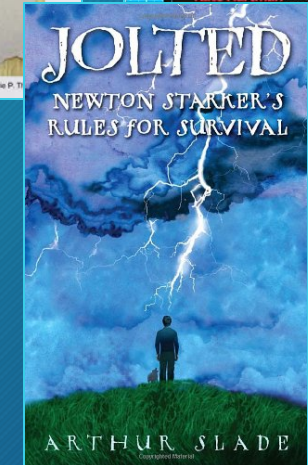
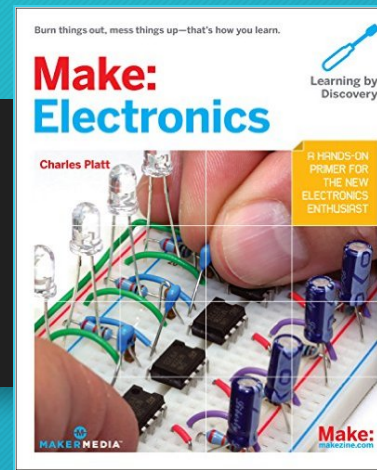
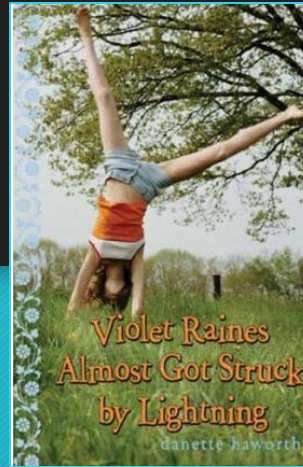
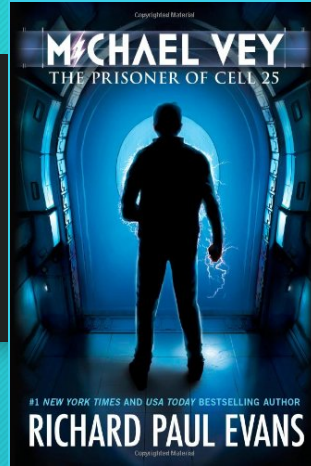
- Mylar
- Ruler
- Aluminum Foil
- Tape
- Craft Knife
- Screwdriver
- Travel Bin



# Circuits

- Books:

- *Ashes* by Ilsa J. Bick
- *Squishy Circuits* by Kristin Fontichiaro
- *Michael Vey: The Prisoner of Cell 25* by Richard Paul Evans
- *Make: Wearable Electronics: Tools & Techniques for Prototyping Interactive Wearables* by Kate Hartman
- *Make: Electronics: Learn by Discovery* by Charles Platt
- *Violet Raines Almost Got Struck by Lightning* by Danette Haworth
- *Jolted: Newton Starker's Rules for Survival* by Arthur Slade



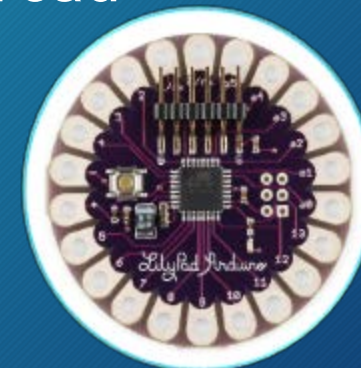
# Circuits = \$358.01

- Projects:
  - LilyPad Arduino Fabric Circuits
  - MaKey MaKey
  - Squishy Circuits
  - Electronic SNAP Circuits

- Supplies:
  - Batteries



- Tape
- Fabric
- Scissors
- LEDs
- Needles
- Double-Sided Tape
- Conductive Thread
- Travel Bin



**Aggieville Mini Maker Faire** **Call for makers!**

Join us at the second annual Aggieville Mini Maker Faire on Moro Street in Aggieville

looking for:  
interactive art projects bicycles  
space projects glassblowing  
textile arts and crafts electronics  
sustainability rockets and RC toys  
robotics CNC mills and 3D printers

**Sept 12 • 10am-4pm**

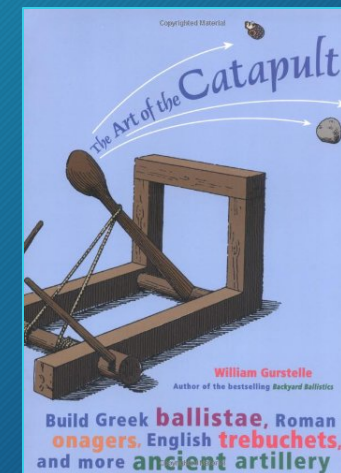
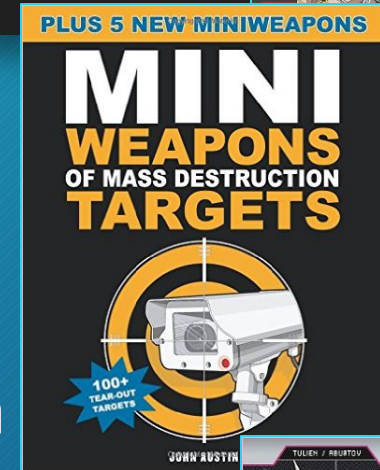
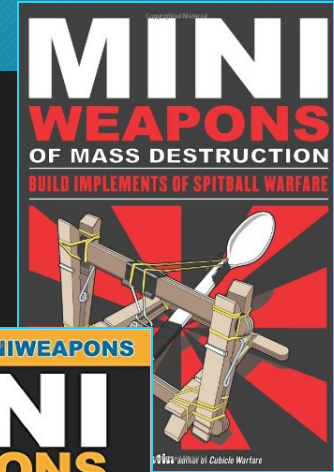
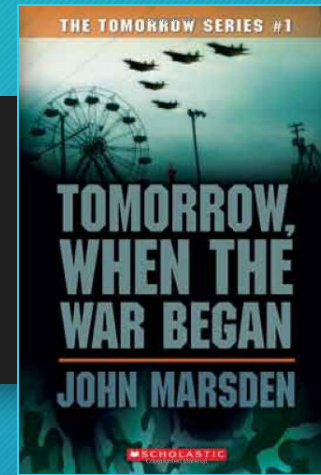
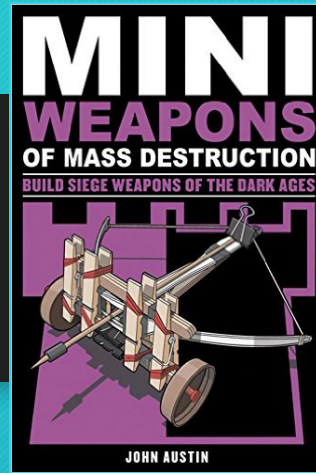
Maker Faire showcases the amazing work of all kinds and ages of makers - anyone who is embracing the do-it-yourself (or do-it-together) spirit and wants to share their accomplishments with an appreciative audience.

to get your own booth space, visit [aggievilleminimakerfaire.com](http://aggievilleminimakerfaire.com)

# Mini Weapons

- Books:

- *Mini Weapons of Mass Destruction* by John Austin
- *Mini Weapons of Mass Destruction 3* by John Austin
- *Mini Weapons of Mass Destruction Targets* by John Austin
- *Paintball Punk* by Sean Tulien
- *Point-Blank Paintball* by Scott Ciencin
- *The Art of The Catapult* by William Gurstelle
- *Tomorrow, When the War Began* by John Marsden

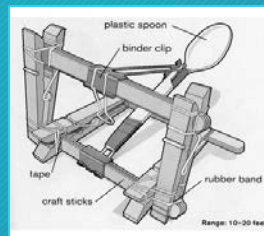
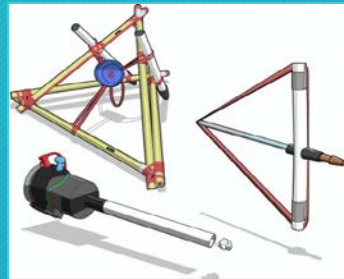


# Mini Weapons = \$157.96

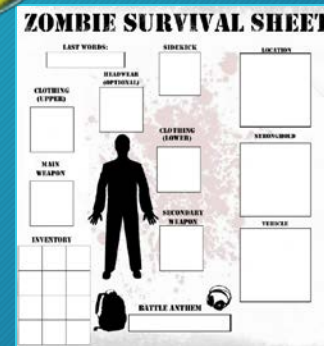


- Projects:
  - Based on the ideas in the books

- Supplies:
  - Scissors
  - Rulers
  - Glue Gun & Glue
  - Binder Clips in 3 Sizes
  - Clothes Pins
  - Craft Knives
  - Wire Cutter



- Pens
- Duct Tape
- Pencils
- Tacks
- Toothpicks
- Marshmallows
- Tongue Depressors
- Rubber bands
- Travel Bin

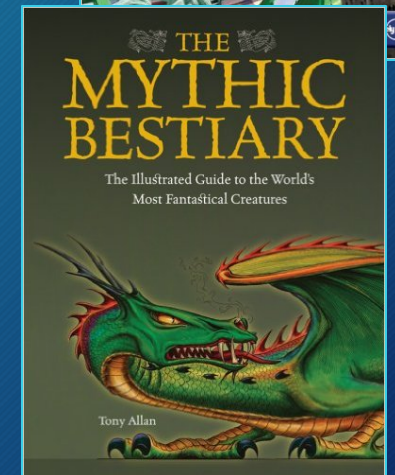
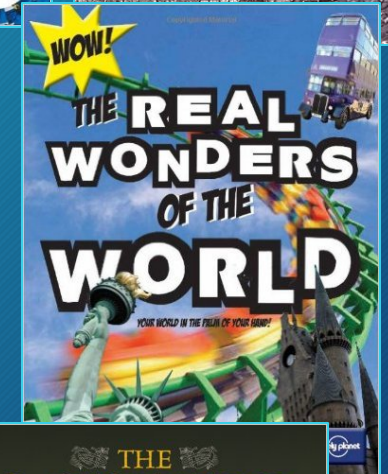
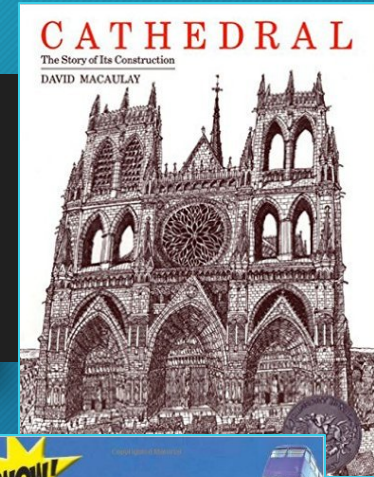
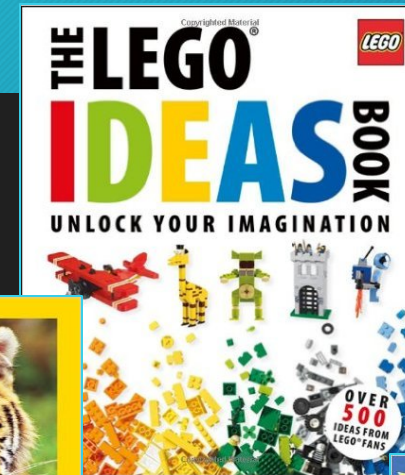
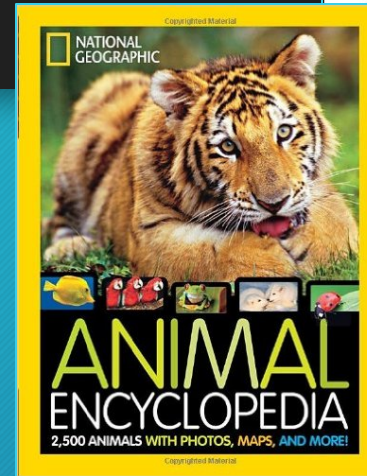
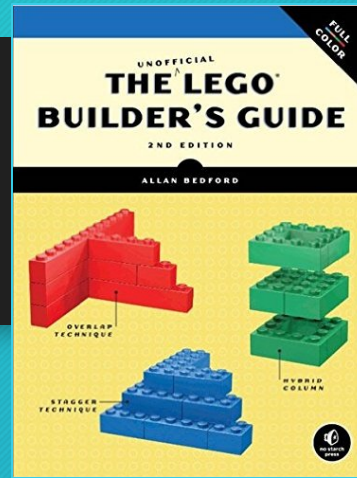
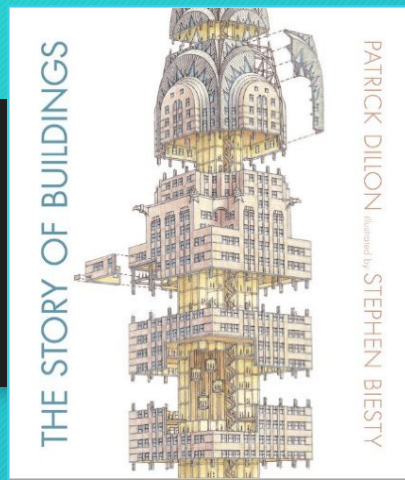




# Builder

- Books:

- *The Story of Buildings* by Patrick Dillon
- *The Mythic Bestiary* by Tony Allan
- *Cathedral* by David MacAulay
- *The LEGO Ideas Book* by Daniel Lipkowitz
- *Lonely Planet Not-for-Parents: The Real Wonders of the World* by Moira Butterfield
- *The Unofficial LEGO Builder's Guide* by Allan Bedford
- *National Geographic Animal Encyclopedia* by Lucy Spelman



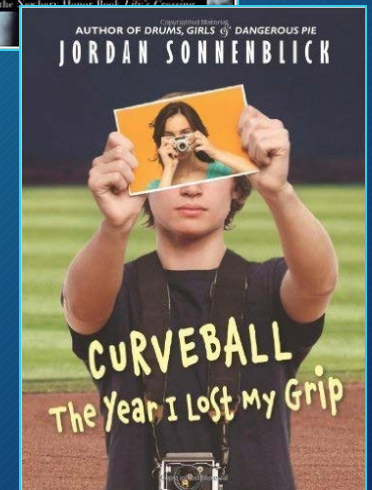
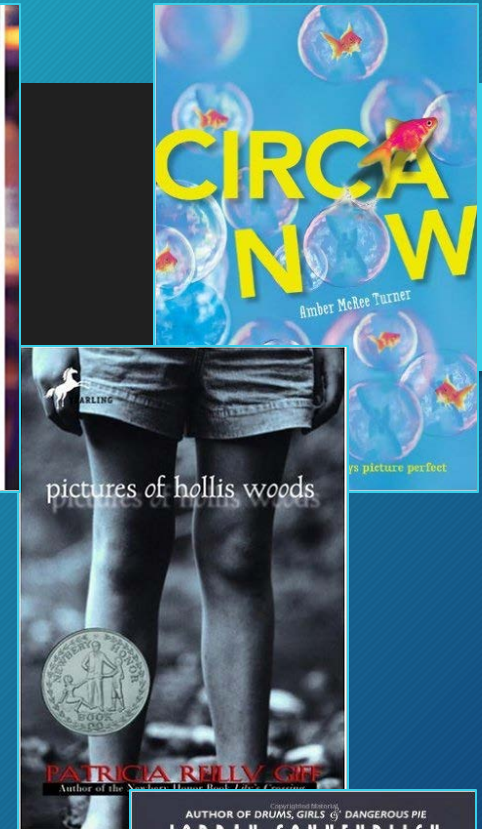
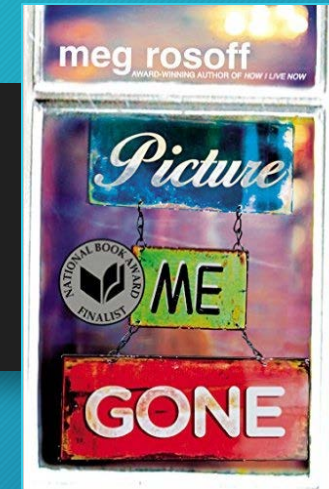
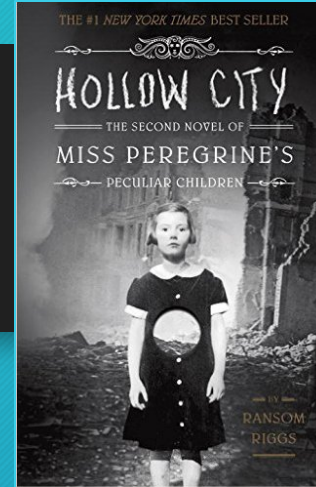
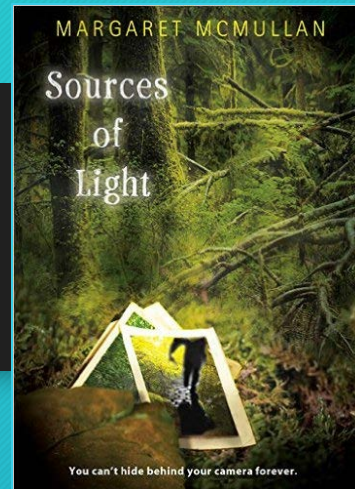
# Builder = \$262.12

## • Supplies:

- 607 LEGO Bricks
- Tumble Tree Timbers (Lincoln Logs)
- Fiddlestix (Tinkertoys)
- 521 K'Nex Pieces
- Krinkles (Bristle Blocks)
- 3D Printed Joiner Pieces
- Travel Bin



# Photo Booth 1

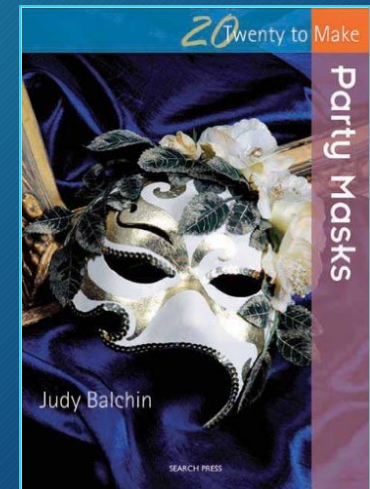
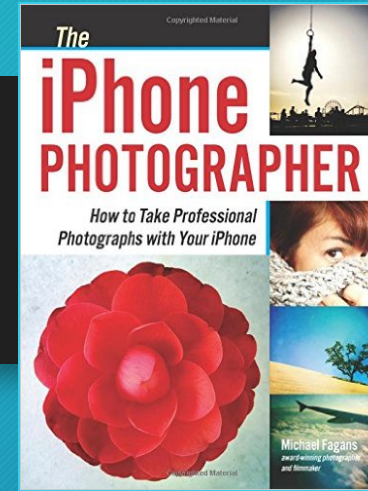
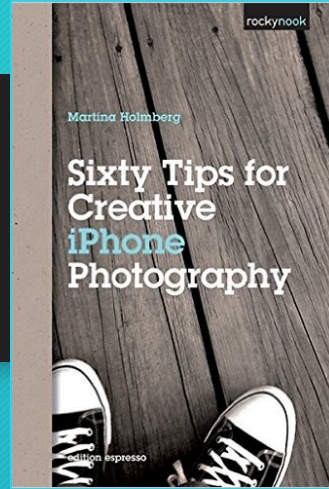


- Books:
  - *Rain Is Not My Indian Name* by Cynthia Leitich Smith
  - *Sources of Light* by Margaret McMullan
  - *Curveball: The Year I Lost My Grip* by Jordan Sonnenblick
  - *Pictures of Hollis Woods* by Patricia Reilly Giff
  - *Hollow City* by Ransom Riggs
  - *Circa Now* by Amber McRee Turner
  - *Picture Me Gone* by Meg Rosoff

# Photo Booth 2

- Books:

- *Sixty Tips for Creative iPhone Photography* by Martina Holmberg
- *iPad & iPhone Digital Photography Tips & Tricks* by Jason R. Rich
- *The iPhone Photographer* by Michael Fagans
- *The Paper Hat Book* by Alyn Carlson
- *Party Masks* by Judy Balchin
- *SnApp Shots* by Adam Bronkhorst



# Photo Booths = \$235.26



## • Resources:

- Canon SELPHY CP910 Wireless Color Printer
- Canon Printer Paper
- Travel Bin



## • Supplies:

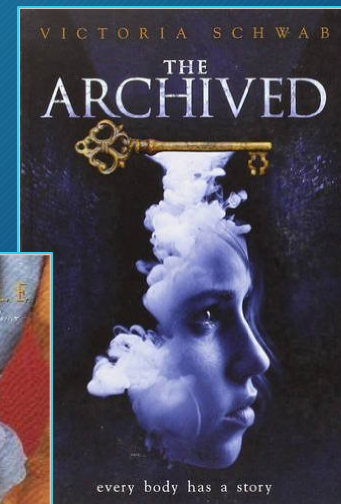
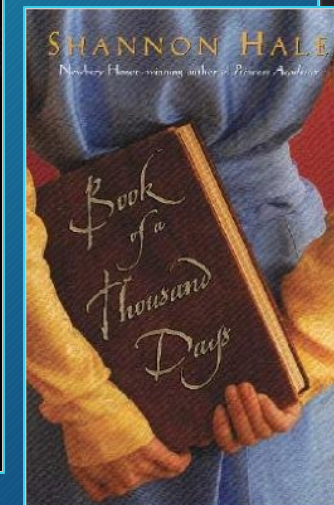
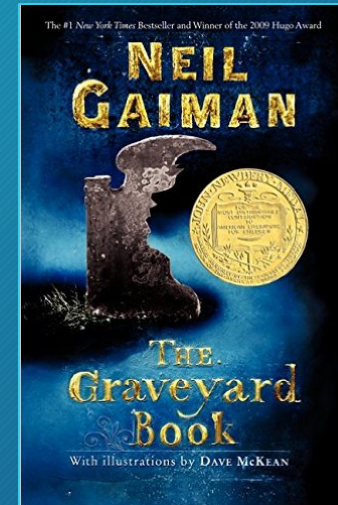
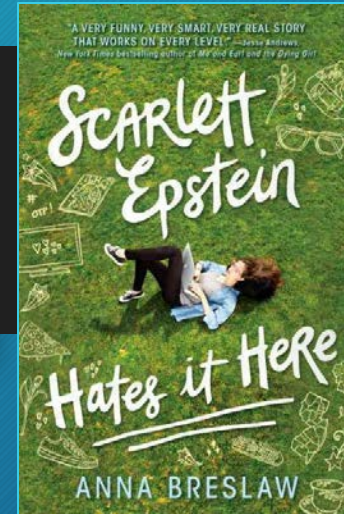
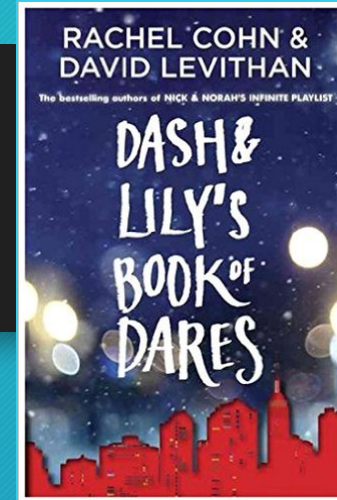
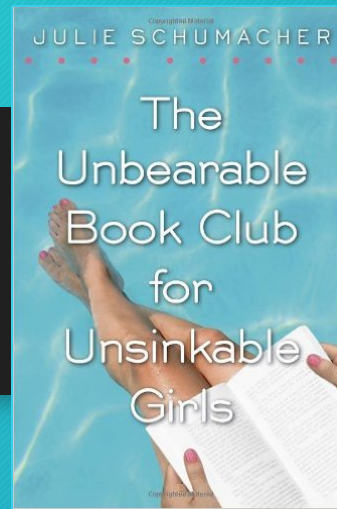
- Props
- Cardstock
- Travel Bin
- Speech Balloons & Markers
- Fabric Backdrops



# Repurposing Books

- Books:

- *Dash & Lily's Book of Dares* by Rachel Cohn & David Levithan
- *Scarlett Epstein Hates It Here* by Anna Breslaw
- *The Unbearable Book Club for Unsinkable Girls* by Julie Schumacher
- *Book of a Thousand Days* by Shannon Hale
- *The Graveyard Book* by Neil Gaiman
- *The Grimm Legacy* by Polly Shulman
- *The Archived* by Victoria Schwab

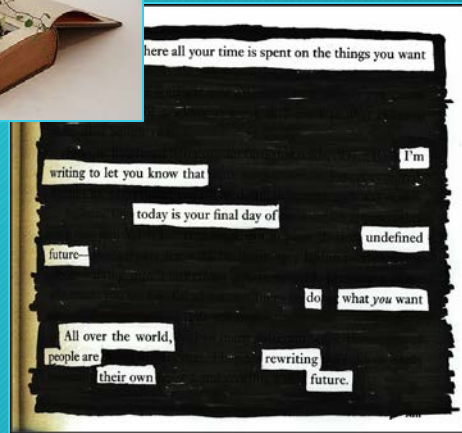


# Repurposing Books = \$135.75



- Supplies:

- Craft Knives
- Modge Podge
- Foam brushes
- Fishing Line
- Ribbon Spools
- Needle-nose Pliers
- Twine



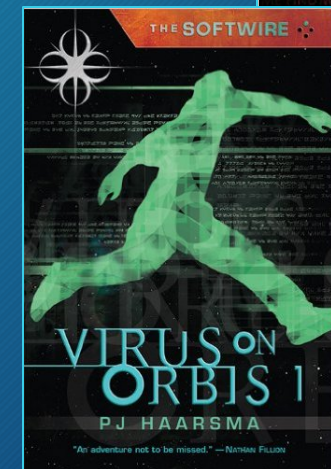
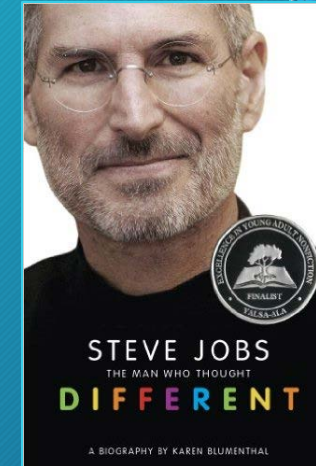
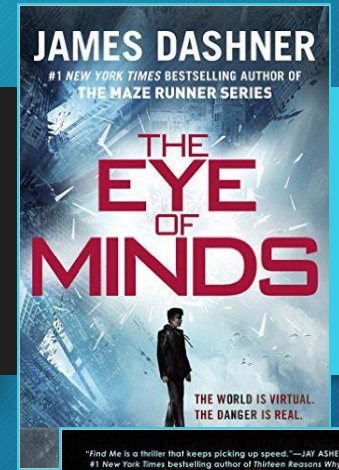
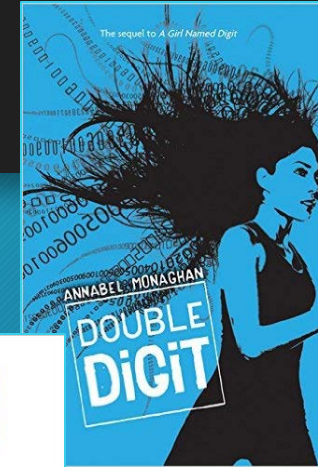
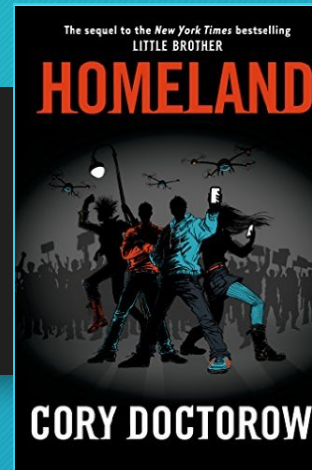
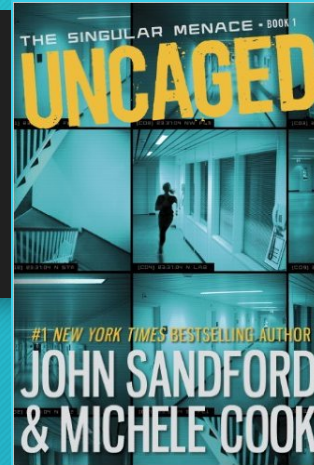
- Scissors
- Wire
- Glue
- Glue Gun
- Glue Gun Glue
- Double-sided Tape
- Glue Sticks
- Rulers
- Travel Bin



# Break It reMake It

## • Books:

- *Double Digit* by Annabel Monaghan
- *The Eye of Minds* by James Dashner
- *Find Me* by Romily Bernard
- *Homeland* by Cory Doctorow
- *Virus on Orbis 1* by P.J. Haarsma
- *Uncaged* by John Sandford & Michele Cook
- *Steve Jobs: The Man Who Thought Different* by Karen Blumenthal





# Break It reMake It = \$181.11

- Resources:

- Computers or laptops to dismantle
- Belkin Computer Tool Kit

- Supplies:

- Scissors
- Pipe cleaners
- Wiggly eyes

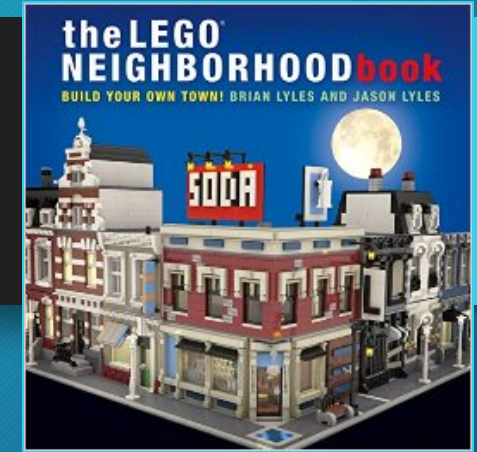
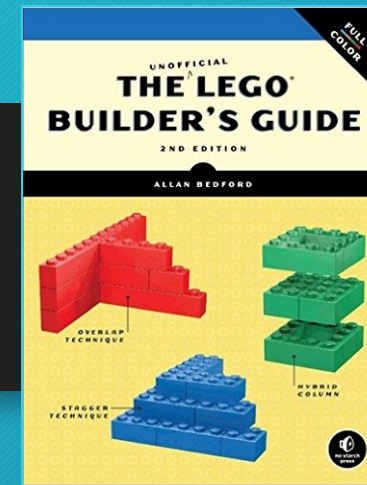
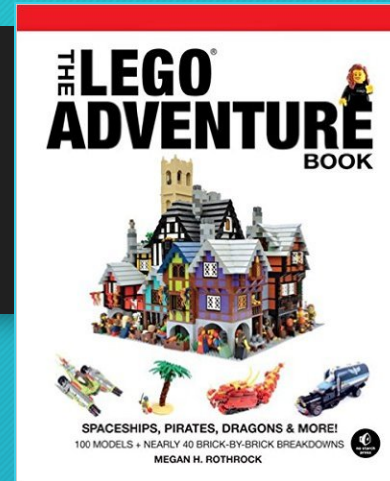


- Earring backs

- Beads
- Beading wire
- Stretch cord
- E6000 Glue
- Lobster clasps & Jump rings
- Double-Sided tape
- Magnetic sheets
- Travel Bin

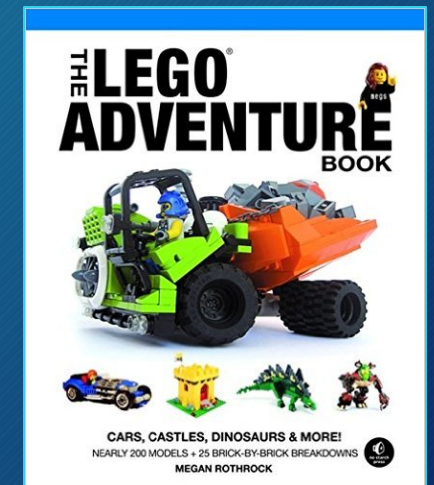


# LEGO



- Books:

- *The LEGO Neighborhood Book: Build Your Town* by Brian and Jason Lyles
- *The LEGO Adventure Books: Cars, Castles, Dinosaurs & More* by Megan H. Rothrock
- *The LEGO Adventure Books: Spaceships, Pirates, Dragons & More* by Megan H. Rothrock
- *The LEGO Build-It Book: Amazing Vehicles* by Nathanael Kuipers
- *The Unofficial LEGO Builder's Guide* by Allan Bedford



LEGO = \$147.94 each



- Projects:

- LEGO Club suggestions
- LEGO Challenges
- Stop Motion Animation information

- Resources:

- 1 Lay-n-Go Bag/Play Mat each
- 5 LEGO Building Mats each
- 5,000 LEGO blocks each



# Activity #1

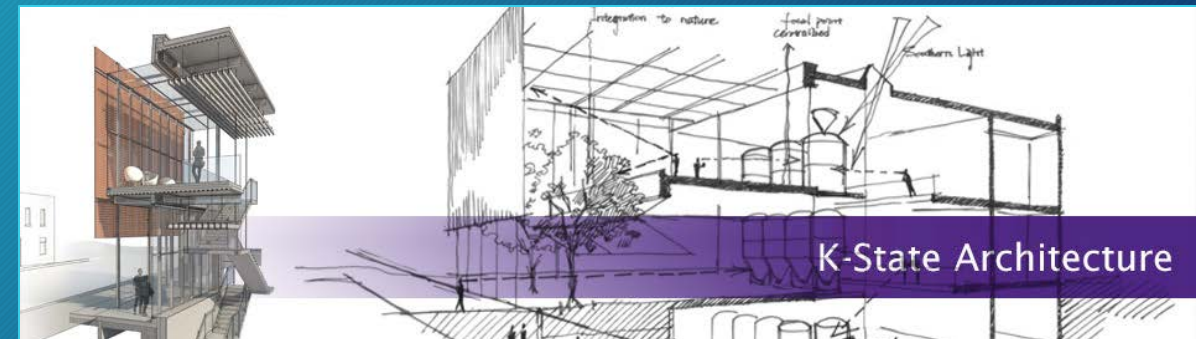
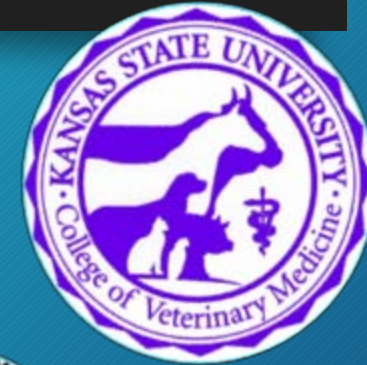
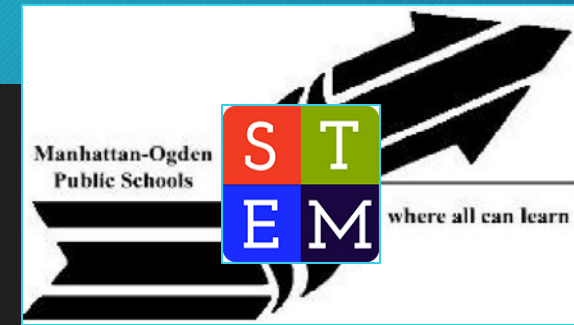
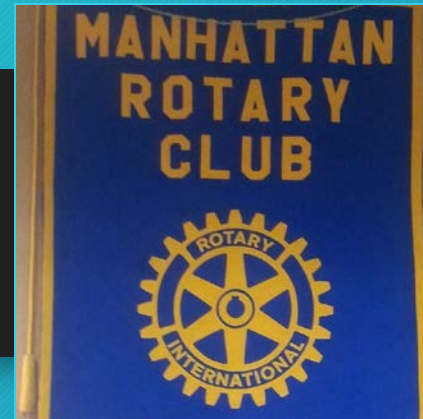
## Makerbox Passive Program Ideas

1. Brainstorm ideas for passive programs that you could present at your library.
2. Pick a Science, Technology, Engineering, or Math focus.
  - a) How does that work with your makerbox?
  - b) What does that change about your program?
3. Share ideas to room

**8 minutes**

# Partnership Opportunities

- Local Schools, Businesses, & Organizations:
  - Universities, Community Colleges, & Vocational Schools
  - Military Bases & Veterans' Groups
  - Telecommunications & Computer Companies
  - AmeriCorps & Job Corps
  - Rotary International
  - Lions Club International
  - The American Legion
  - Jaycee Club

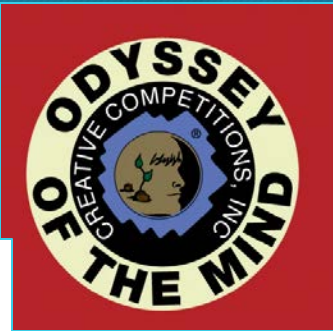


# Partnership Opportunities

- Clubs:
  - Girl and Boy Scouts
  - 4H
  - Odyssey of the Mind
  - First LEGO League
  - Gardening
  - Woodworking
  - Astronomy



BOY SCOUTS  
OF AMERICA®

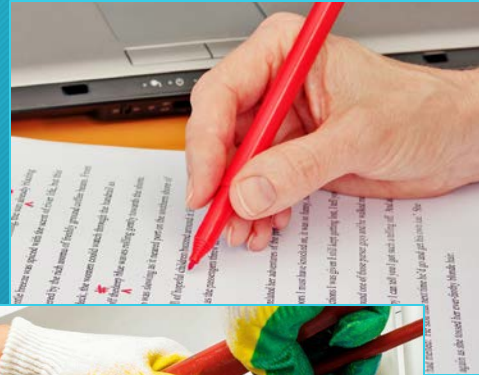
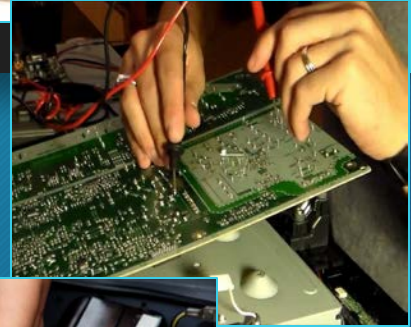


Gardening Club



# Partnership Opportunities

- Individuals in Your Community:
  - Current & Retired Teachers
  - Plumbers and Water Treatment Managers
  - Electricians & Carpenters
  - Automotive & Bicycle Mechanics
  - Gardeners & Landscape Artists
  - Health Professionals
  - Bakers & Chefs
  - Radio & Sound Technicians
  - Video, Movie, & TV Technicians



# Activity #2

## Program with a Partnership Ideas

1. Brainstorm ideas for partnered programs that you could host.
2. Who, within your community, would you partner with?
  - a) How does that work with your makerbox?
  - b) What does that change about your program?
3. Share ideas to room

**8 minutes**

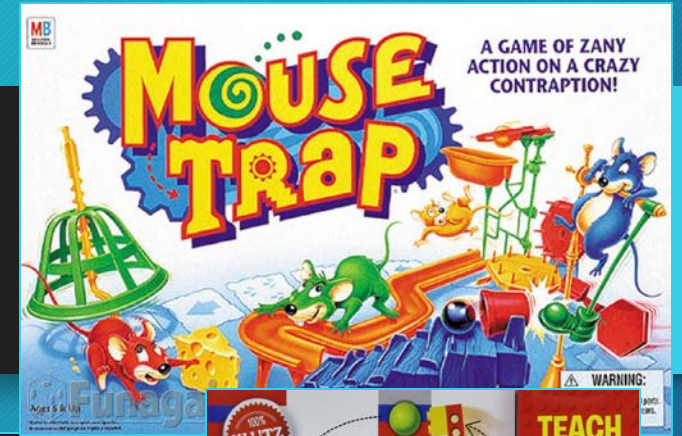


# Evaluating Our Makerboxes

- In the last two years, our makerboxes have circulated 62 times to 21 of our libraries.
- I've had an increase in requests for Teen Services consulting.
- We've seen an increased interest in the Maker Movement.

# The Future of the Makerboxes

- Rube Goldberg Machine
- Coding
- Stop Motion & Movie Making



# What Are Other Library Systems & Consortiums Doing?

- Arrowhead Library System

Arrowhead Library System Mobile Makerspace accessed from <http://als.lib.wi.us/Makerspace/index.html>

- Blue Valley School District

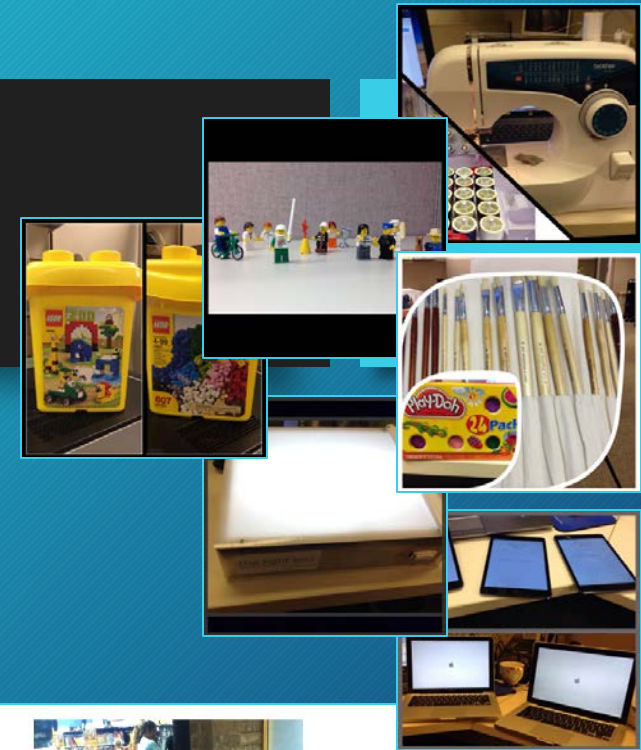
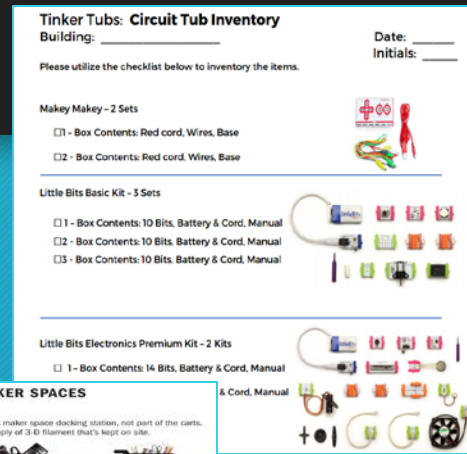
Educational Technology Blue Family Schools accessed from [http://www5.bluevalleyk12.org/techsource/?page\\_id=5453](http://www5.bluevalleyk12.org/techsource/?page_id=5453)

- Illinois State Library

Make it @ Your Library accessed from <http://makeitatyourlibrary.org/makerkits>

- Knox County School District

Johnson, et al. (2016). "Mobile Maker Spaces," *School Library Journal*. Accessed from <http://www.slj.com/2016/05/technology/mobile-maker-spaces/>



# Activity #3

## Mystery Maker Bags

1. Pretend that you have an unlimited supply of each of the items in your bag.
2. Plan a maker program using these materials.
3. Share ideas to room.

**10 minutes**

Questions?



# Thank you

Melendra Sutliff Sanders

Youth Consultant

North Central Kansas Libraries System

629 Poyntz Ave.

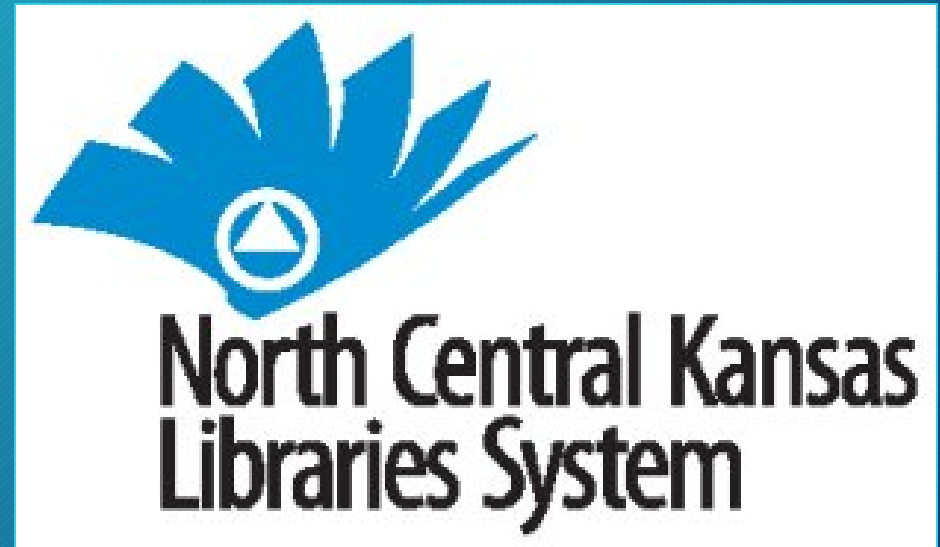
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800.432.2796

[msanders@nckls.org](mailto:msanders@nckls.org)

<http://lib.nckls.org/>



# Resources

Arrowhead Library System. (N/A). *Arrowhead Library System Mobile Makerspace*. Retrieved from <http://als.lib.wi.us/Makerspace/index.html>.

Blue Valley Educational Technology Services. (2013). *Tinker Tub*. Retrieved from [http://www5.bluevalleyk12.org/techsource/?page\\_id=5453](http://www5.bluevalleyk12.org/techsource/?page_id=5453).

Gibrich, C. (2016, August 19). *Mobile Makerspaces*. Retrieved from [www.teenservicesunderground.com/mobile-makerspaces/#more-5592](http://www.teenservicesunderground.com/mobile-makerspaces/#more-5592).

Johnson, M., Witte, B., Randolph, J., Smith, R., & Cragwall, K. (2016, May 3). *Mobile Maker Spaces*. Retrieved from <http://www.slj.com/2016/05/technology/mobile-maker-spaces/>.

Make It @ Your Library (N/A). *Maker Kits*. Retrieved from <http://makeitatyourlibrary.org/makerkits>.

Rendina, D. (2015, April 2). *Defining Makerspaces: What the Research Says*. Retrieved from Renovated Learning <http://renovatedlearning.com/2015/04/02/defining-makerspaces-part-1/>.