
***Making and Tinkering With STEM:
Solving Design Challenges with Young Children***

Cate Heroman

Additional Resources

Websites

Caine's Arcade

<http://cainesarcade.com/>

Children's Museum of Pittsburgh's MAKESHOP Blog

<http://Makeshoppgh.org>

Exploratorium's Tinkering Studio

<http://tinkering.exploratorium.edu/projects>

Learning Dimensions Framework and Facilitation Moves Handout

<https://tinkering.exploratorium.edu/learning-and-facilitation-framework>

Scribbling Machines

https://tinkering.exploratorium.edu/sites/default/files/Instructions/scribbling_machine_s.pdf

Tinkering Studio Projects

<https://tinkering.exploratorium.edu/projects>

Family Creative Learning Facilitation Guide

<http://family.media.mit.edu/guide/>

Invent to Learn

<http://inventtolearn.com>

Lighthouse Charter School Creativity Lab

<http://lighthousecreativitylab.org/projects/project-guides/>

Making, Tinkering and The Toy Store Project

<https://www.naeyc.org/blogs/making-tinkering-toy-store-project>

New York Hall of Science (NYSci): Maker Space Downloadable Makezines

<http://nysci.org/nysci-makerzines-now-available-for-download/>

Reusable Resource Association

<http://www.reuseresources.org/find-a-center.html>

Scribbling Machines

<https://www.naeyc.org/blogs/scribbling-machines>

Tinker Lab

<http://tinkerlab.com/>

Articles

Brahms, L., & Wardrip, P.S. 2016. "Learning Practices of Making." *Teaching Young Children* 10 (1): 26–29. <http://www.naeyc.org/tyc/circuitresources>.

Brahms, L., & Wardrip, P.S. 2016. "Making With Young Learners: An Introduction." *Teaching Young Children* 9 (5): 6–8. <http://www.naeyc.org/tyc/making-young-learners-intro>.

Brahms, L., & Wardrip, P.S. 2017. "The What, How, and Why of Making." 10X. *Teaching Young Children* 10 (3): 16–17.

Brahms, L., Wardrip, P.S., Bresson, L.M., & King, M. 2017. "Create Problems for Your Preschoolers, Don't Solve Them! The Learning Practices of Making in Your Interest Centers." *Teaching Young Children* 10 (4): 12–15.

Dickerson, M. 2016. "Making at Home." Message in a Backpack. *Teaching Young Children* 10 (1): 30.

Dickerson, M. 2016. "Books That Encourage Making." Now Read This! *Teaching Young Children* 9 (5): 9.

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Heroman, C. 2017. "Bringing Design Challenges to the Classroom: 'Bug City'." *Teaching Young Children* 10 (5): 9-11.

Books

Akiyama, Lance. 2016. *Rubber Band Engineer*. Quarto Publishing Group.

Baggett, Alice. 2016. *Making in the K-3 Classroom: Why, How, and Wow!* Construction Knowledge Press.

Boston Children’s Museum. 2016. *Tinker Kit: Educators’ Guide*. Boston Children’s Museum.
[http://www.bostonchildrensmuseum.org/sites/default/files/pdfs/Tinker Kit Educators Guide singles web.pdf](http://www.bostonchildrensmuseum.org/sites/default/files/pdfs/Tinker%20Kit%20Educators%20Guide%20singles%20web.pdf).

Doorley, Rachelle. 2014. *Tinkerlab: A Hands-On Guide for Little Inventors*. Roost Books.

Doudna, Kelly. 2015. *The Kids Book of Simple Machines: Cool Projects & Activities that Make Science Fun*. Mighty Media Kids.

Gabrielson, Curt. 2013. *Tinkering: Kids Learn by Making Stuff*. Maker Media.

Heroman, Cate. 2017. *Making and Tinkering with STEM: Solving Design Challenges with Young Children*. NAEYC.

Honey, Margaret and David E. Kanter. 2013. *Design, Make, Play: Growing the Next Generation of STEM Innovators*. Routledge.

Martinez, Sylvia Libow & Gary S. Stager. 2013. *Invent to Learn: Making, Tinkering, and Engineering in the Classroom*. Constructing Modern Knowledge.

Resnick, Mitch. 2017. *Lifelong Kindergarten: Cultivating Creativity through Projects, Passion, Peers and Play*. MIT Press.

Thomas, AnnMarie. 2014. *Making Makers: Kids, Tools, and the Future of Innovation*. Maker Media.

Wall, Cindy and Lynn M. Pawloski. 2014. *The Maker Cookbook: Recipes for Children’s and Tween Library Programs*. Libraries Unlimited.

Wilkinson, Karen and Mike Petrich. 2014. *The Art of Tinkering*. Weldon Owen.

Webinars and Interviews

Makerspaces in Early Childhood: Something Old, Something New

Studentcentricity with Rae Pica

BAM! Radio Network

<https://www.jackstreet.com/jackstreet/WSCR.Heroman.cfm>

NAEYC Webinar with Cate Heroman (recorded March 24, 2017)

Making and Tinkering with STEM

<https://www.youtube.com/watch?v=65X2bEYCAIs>

NAEYC Back to School Webinar (recorded September 17, 2017)

<https://www.youtube.com/watch?v=M67tDikVU6Q>

Cardboard Maker Shop

Google Hangout Interview with Cate Heroman, hosted by Tinkering Studio's Karen Wilkinson

<https://www.youtube.com/watch?v=Q5NMtTNF15o&t=4s>

Online Courses

Tinkering Fundamentals: Circuits

<https://www.coursera.org/learn/tinkering-circuits>

Free online course from the Exploratorium's Tinkering Studio featuring circuit blocks, scribbling machines, toy take apart, paper and sewn circuits and more.

Tinkering Fundamentals: Motions and Mechanisms

<https://www.coursera.org/learn/tinkering-motion-mechanisms>

Free online course from the Exploratorium's Tinkering Studio featuring marble machines, chain reactions, linkages, cardboard automata and more.

Other Tools and Resources

Energy Stick by Steve Spangler

This is a simple teaching tool to help children learn about open and closed circuits.

https://www.amazon.com/Be-Amazing-Toys-Energy-Stick/dp/B004K0DSDC/ref=sr_1_1?s=boost&srs=12034488011&ie=UTF8&qid=1505764782&sr=1-1&keywords=energy+stick

Surebonder CoolShot Low Temp Glue Gun

This is a super low temp glue gun that has a protective covering around the tip. You also use special super low temp glue sticks with it.

https://www.amazon.com/Surebonder-KD-160FKIT-Cool-Shot-Mini/dp/B00HC18CI2/ref=sr_1_3?s=boost&srs=12034488011&ie=UTF8&qid=1505764862&sr=8-3&keywords=coolshot+low+temp+glue+gun

Klever Cutter Safe Box Cutter

This cardboard cutter has a recessed blade that fingers can't reach.

https://www.amazon.com/Klever-Kutter-10-Pack-Blue/dp/B01KYVJWOO/ref=sr_1_fkmr0_2?s=boost&srs=12034488011&ie=UTF8&qid=1505765005&sr=8-2-fkmr0&keywords=klever+kut

Circuit Blocks and Alligator Clips

This website has simple circuit blocks with batteries, motors, lights, and buzzers for children to investigate.

<http://www.ciplearningstore.com/circuit-block-sets/>
<http://www.ciplearningstore.com/circuit-block-sets/alligator-clip-wires-set-of-3>

Squishy Circuits

Squishy circuits uses conductive and insulating playdough to create simple circuits to light up LEDs, spin motors, and make noises with a buzzer.

<https://squishycircuits.com/>