

Rick's Maker Space Highlights

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Books for Ideas:

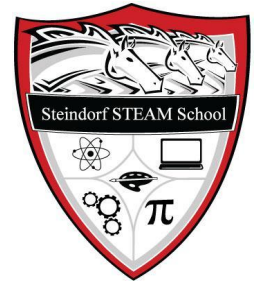
- The Big Book of Maker Space Projects
- Tinkering - 2nd Edition
- 20 Makey Makey Projects for the Evil Genius
- Make: Planes, Gliders and Paper Rockets
- mBot for Makers

Websites for Rationale, Ideas and Planning:

- Maker Ed: makered.org
- Make: makezine.com
- Steindorf Maker Lab (website above)
- Instructables – www.instructables.com
- Digital Promise - digitalpromise.org/maker-leadership
- Curiosity Machine – Design Challenges Galore! - www.curiositymachine.org/
- Drexel University – Making Culture - <https://drexel.edu/excite/engagement/learning-innovation/making-culture-report/>
- AutoDesk – Getting Started <http://www.makingstartshere.com/teach/>
- Dream Big! - www.discovere.org/dreambig/activities
- K-12 Engineering - www.teachengineering.org
- Event for Inspiration - www.makerfaire.com

If you had a \$1000 budget to get started...

- Glue Guns! (less than \$5 each)
- Tinker Kits (30 for \$150)
- Makey Makey Boards (\$50 each, have kids work in teams - Needs to be connected to a laptop for programming with SCRATCH)
- SCRATCH (Free at: <https://scratch.mit.edu/>) Graphical programming interface to use with Arduino and Makey Makey boards.
- MicroBits - microbit.org - Tiny highly versatile microcontrollers with tons of curriculum. - Circuit Playground Express Board - www.adafruit.com
- Hand tools – www.harborfreight.com - Electric Cardboard Cutters! - Amazon
- DIY Cart and Storage Bins



Parents can donate many of the materials below to build projects from the books listed above using the tools listed above.

- Cardboard
- Craft Sticks
- Rubber Bands
- Craft Supplies
- Tubes
- Aluminum Foil
- Amazon
- Yarn
- Cereal Boxes
- Masking Tape
- Boxes

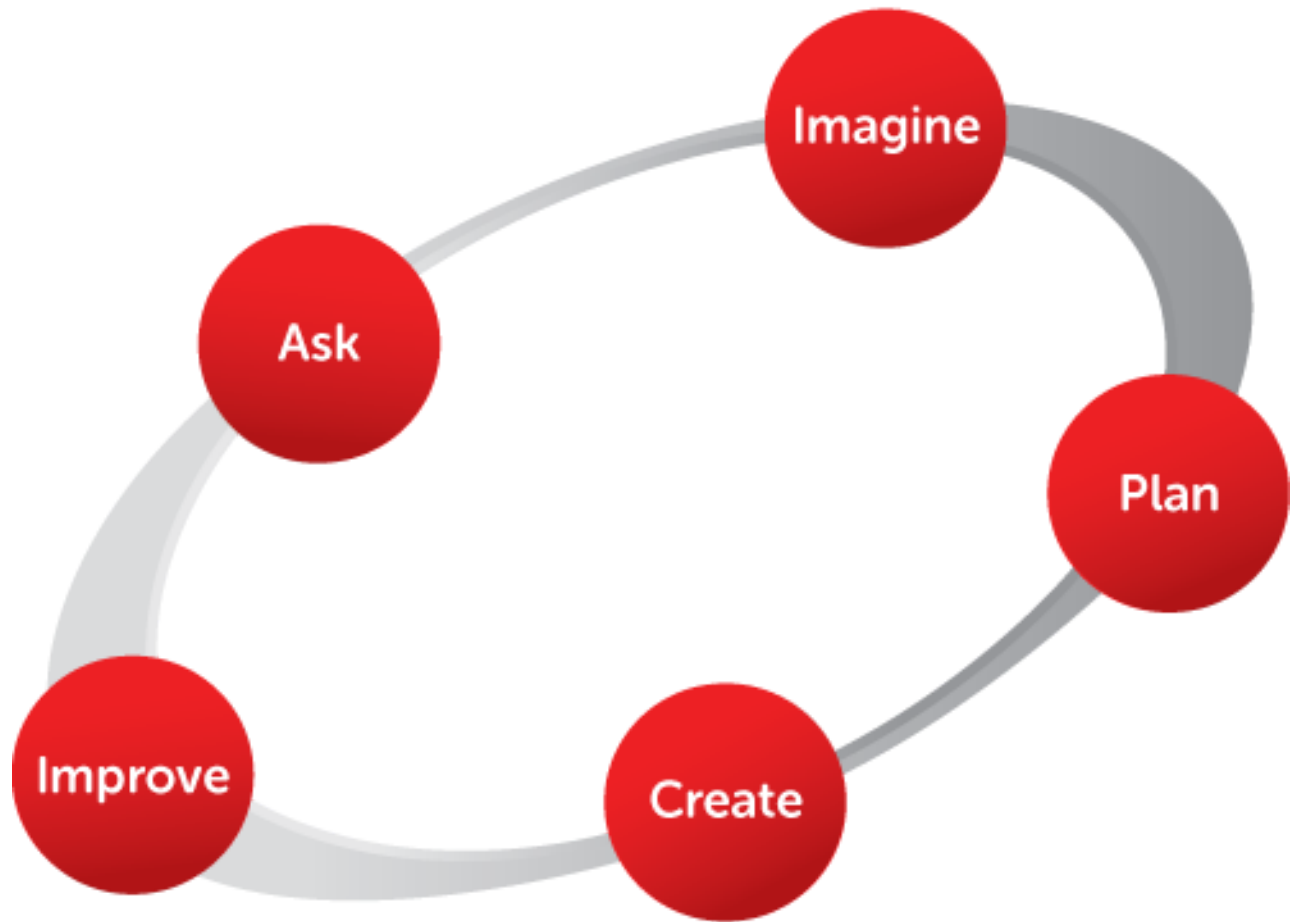
As your Budget Grows (Some of my Favorite Stuff)

- mBots, sensors and mBot Book – www.makeblock.com & amazon.com
- Particle Chips (For IoT Projects) - store.particle.io/
- Marble Paper Roller Coasters – paperrollercoasters.com/
- VEX Robotics - www.vexrobotics.com
- Strawbees - strawbees.com
- Engineering is Elementary – eie.org
- Air Rockets and Gliders – www.airrocketworks.com
- 3D Printer - Dremel 3D20
- Laser Cutter - fslaser.com

The resources listed above provide for **Open Ended** making experiences on a budget, for whole classes of kids. Projects, tools and materials here encourage **Design Thinking** with many different outcomes. For updates to this document go to: www.cambriansd.org/makerlab

The Engineering Design Process

To solve engineering problems, engineers follow a series of steps called the “Engineering Design Process”



ASK: *What is the problem? How have others approached it? What are your constraints?*

IMAGINE: *What are some solutions? Brainstorm ideas. Choose the best one.*

PLAN: *Draw a diagram. Make lists of materials you will need.*

CREATE: *Follow your plan and create something. Test it out!*

IMPROVE: *What works? What doesn't? What could work better? Modify your designs to make it better. Test it out!*

More details at: www.eie.org/eie-curriculum/engineering-design-process