



Cornerstone of
Engineering S-L:
Learning to Think Like
an Engineer

Bigger Than One Class

The Team:

- Dr. Susan Freeman's Cornerstone of Engineering
- Adreene Law and the Timothy Smithy Network
- Roxbury Robotics

The Numbers:

- 14 Classes, 11 Sites
- 140 Kids and Parents
- 80 Volunteers
 - 32 Cornerstone Students
 - 48 Roxbury Robotics Members (2nd-5th years)





Robotics? Engineering? Both.

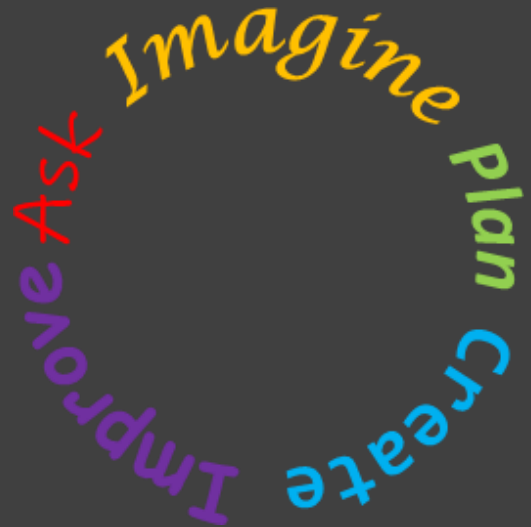
Each class session has two parts:

- Robotics – Learning how to build and program a Lego robot.
- Design Challenges – Learning how to think like an Engineer.



Design Challenges

Using the design process, kids and parents are tasked with solving unordinary problems with ordinary resources.



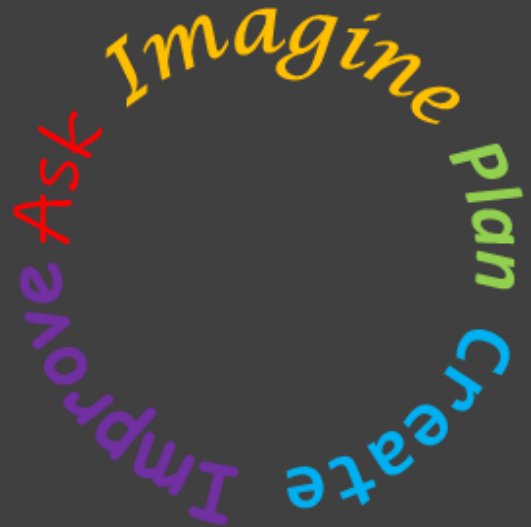
Have you ever tried to get a KitKat off a wall? Build a tower out of spaghetti? Launch a pom-pom with a popsicle stick?

Neither had these kids.

How did they do it? They just followed the design process!

Design Challenges

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The Design Process

Ask – What is the problem you are trying to solve? What is the root cause? Find out everything you can about your problem.

Imagine – Brainstorm. Come up with any idea you can think of, no matter how crazy!

Plan – Go through your ideas, find ones you like, and decide how you're going to move forward. Sketch out some ideas and think about the resources you'll need

Create – Take your plan and run with it. Get your hands dirty. Start building. It's o.k. if your first product isn't perfect, that what the next step is for.

Improve – Test out what you've built. Did it work? Great! Could you improve it? Even better! Regardless, return to Step 1, **Ask** what you could fix, and keep repeating the process until you've engineered something awesome!

Quarantine Design Challenge

Looking for something to do during quarantine? Why not have some fun being an engineer? Challenge your sibling, your parents, or even e-challenge your friends. Here are some of our favorite design challenges! These kids could do them, can you?



Candy Grabber Challenge

Materials:

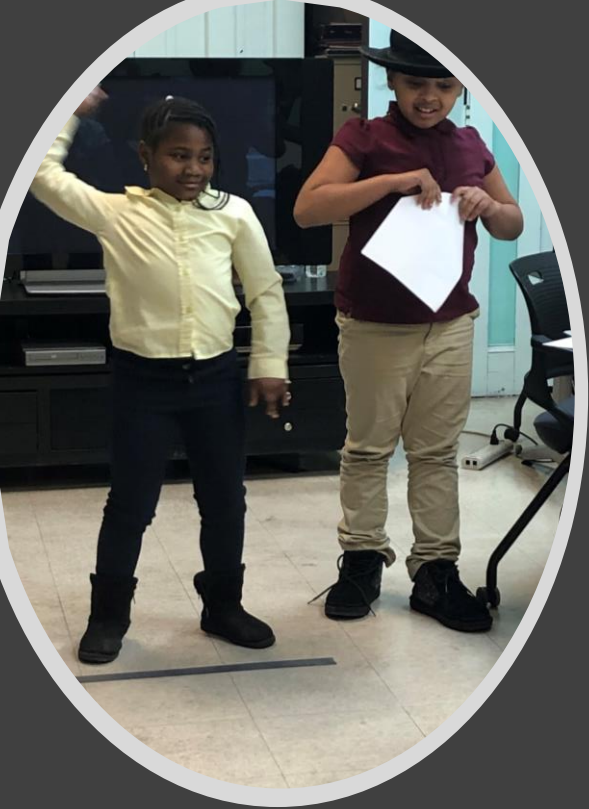
- 10 sheets of paper
- 3 ft. of masking tape + enough to tape the candy to the wall
- 2 paper clips
- 1 KitKat bar (or any sweet treat you want to try and get down) 1 Notepad + pencil for sketching ideas

Instructions:

Tape the candy to the wall way up high so it's hard to reach. Using only the paper, the masking tape, and the paper clips, build a device to get the KitKat down. You must keep your feet flat on the floor at all times. Already tall? Try getting your candy down while kneeling. If you want to make it harder, try taping the candy to the wall using duct tape instead of masking tape. Teamwork is encouraged! Don't forget about the design process!

Imagine
Plan
Create
Improve
Ask





Paper Challenges



Materials:

- Lots of paper

Challenge 1: Paper Tower

Build a tower using only paper. See how high you can get! Make it more challenging by adding an “earthquake” test.

Challenge 2: Paper Bridge

Was the tower too easy? Try building a bridge with only paper! Our record is a 2 ft. span. Can you beat it? Take this challenge to the next level and see which bridge can support the most weight.

Challenge 3: Paper Airplane Challenge

See who can build the best paper airplane. Don't use the internet! Categories: Best flight time, coolest design, furthest distance



Looking for more challenges?
Get creative!

Thanks for checking out our
Virtual Expo Exhibit!

