Makerspace, Innovation & Safety

Josh Ajima
@DesignMakeTeach

Bell Ringer

What do you make?

(Bonus for photos.)

Share with the person next to you and on Padlet.

https://padlet.com/designmaketeach/4u361qzis7rx

Goal

Bring the maker movement into schools.

HANDOUTS & CONTACT INFO

DesignMakeTeach.com/VA4LE

Josh Ajima

@DesignMakeTeach

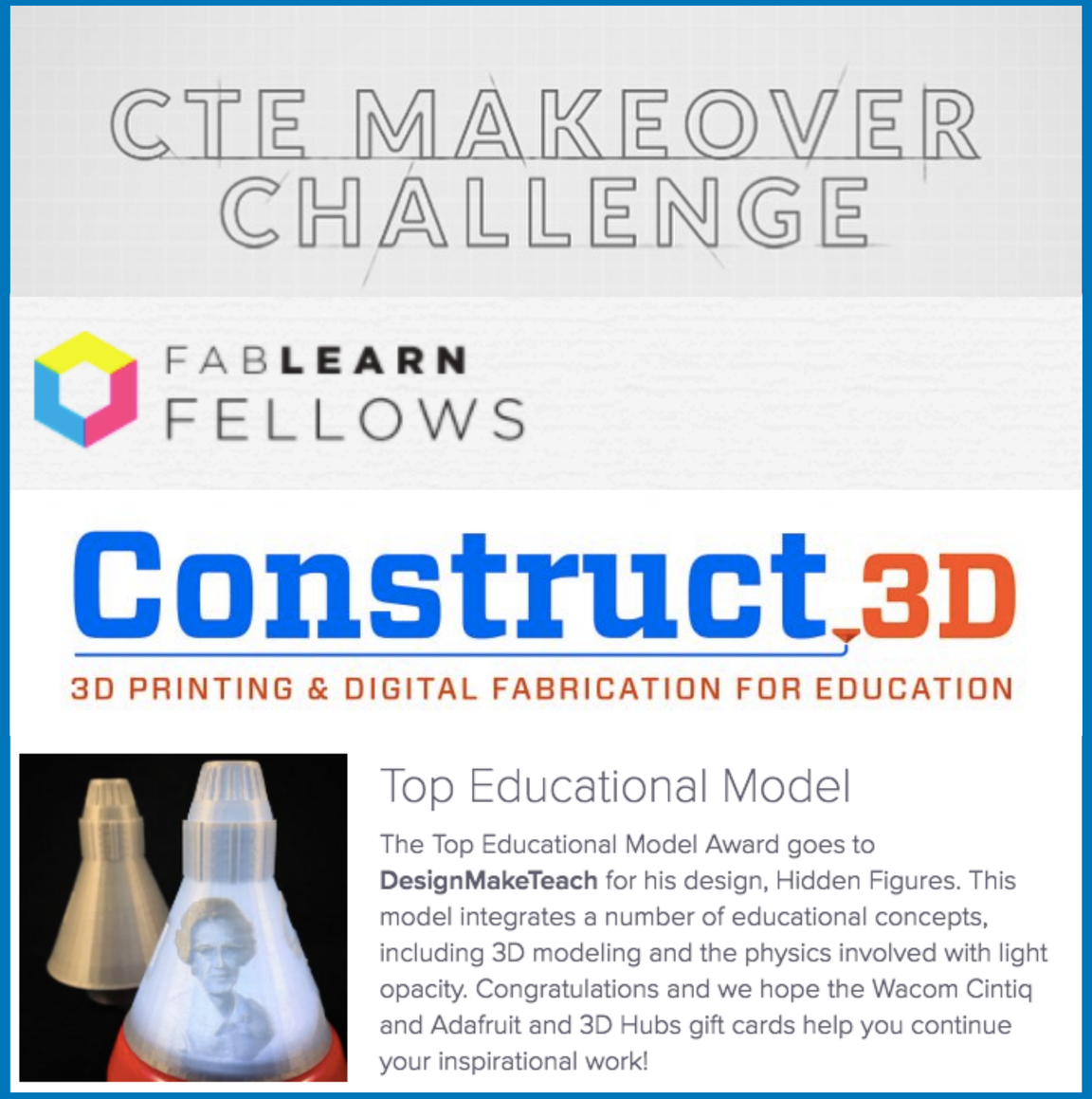
DesignMakeTeach.com

youtube.com/designmaketeach

Agenda

-The Maker Movement
-Scaling Up the Makerspace
-Innovation at the Academies of Loudoun
-Makerspace Safety

MAKER EDUCATOR



VSTE Innovative Educator of the Year

US Department of Education's CTE Makeover Challenge Winner

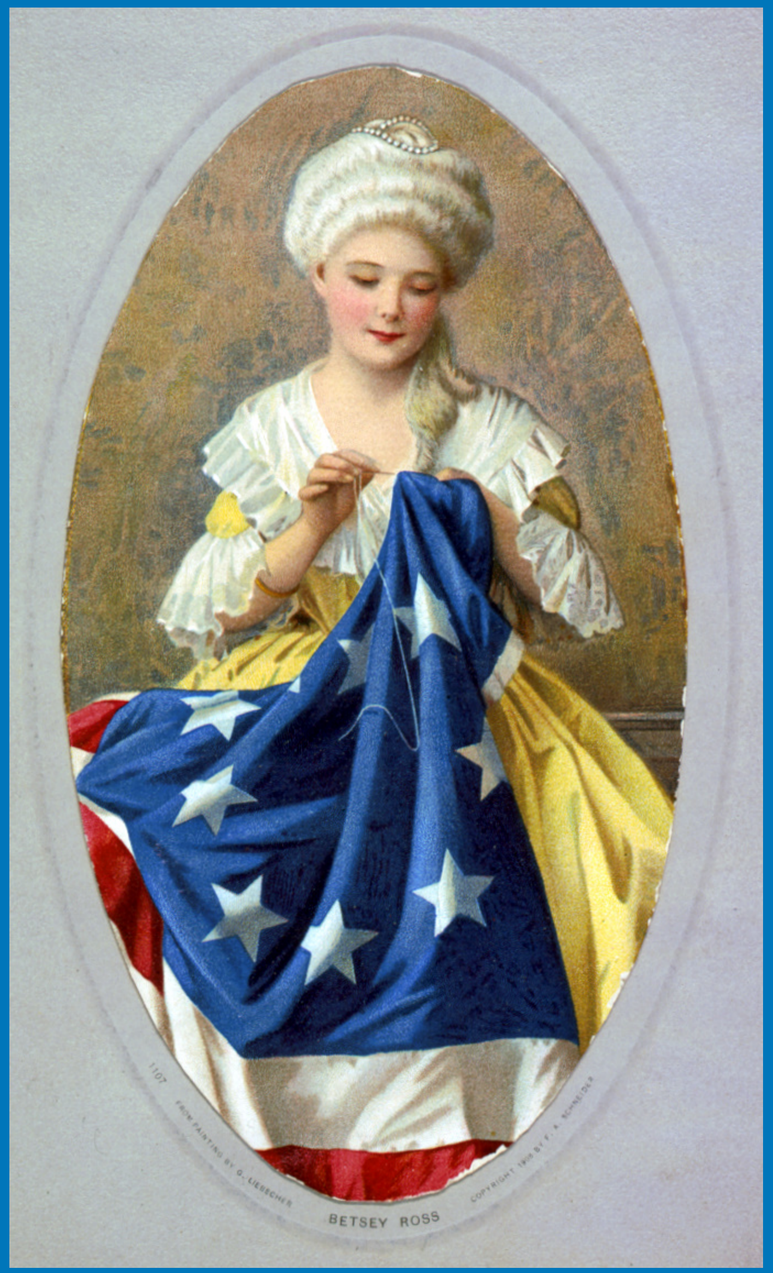
Columbia FabLearn Fellow

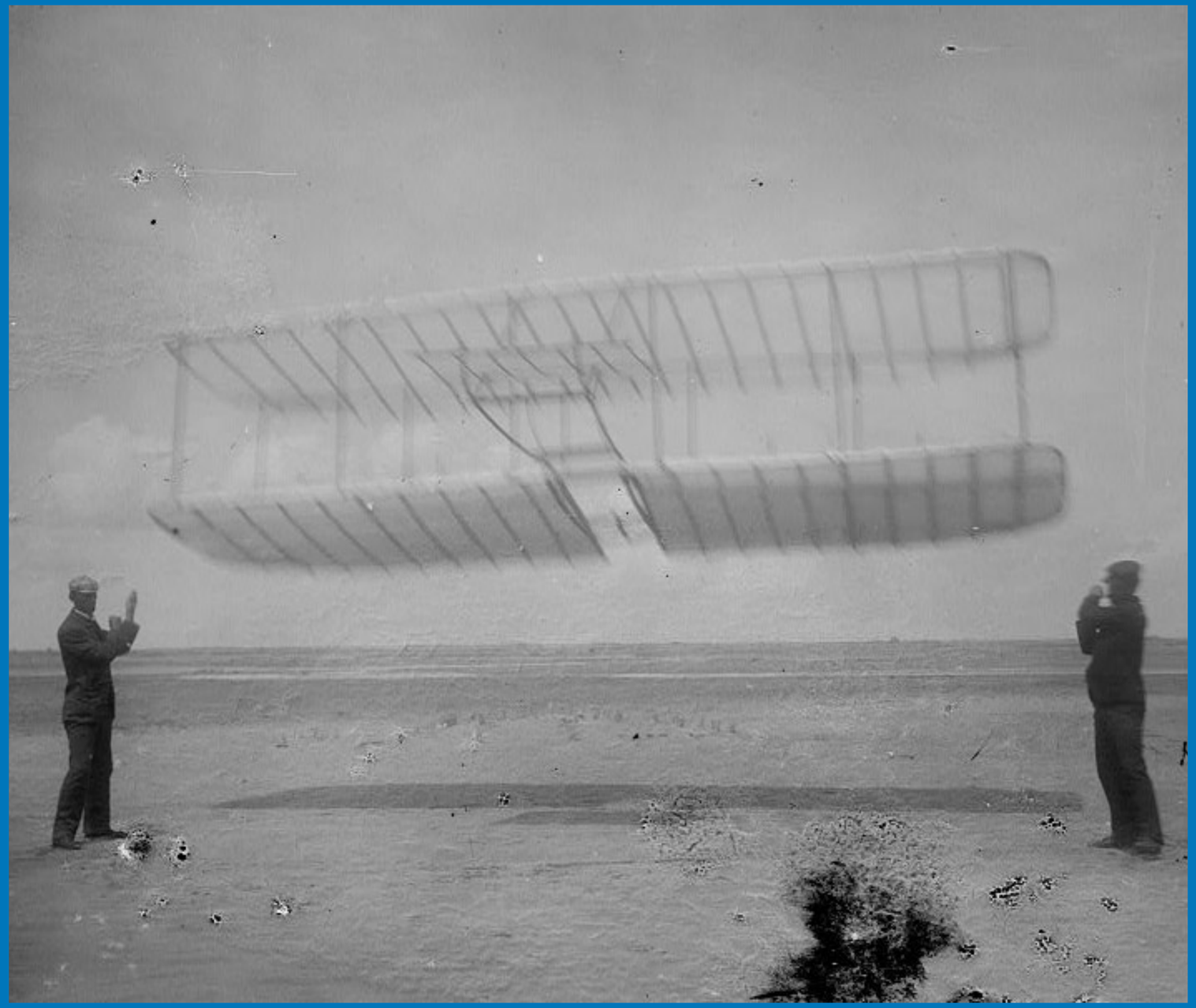
Formlabs 3D Design Awards - Top Educational Model

Makerspace Facilitator
-Academies of Loudoun

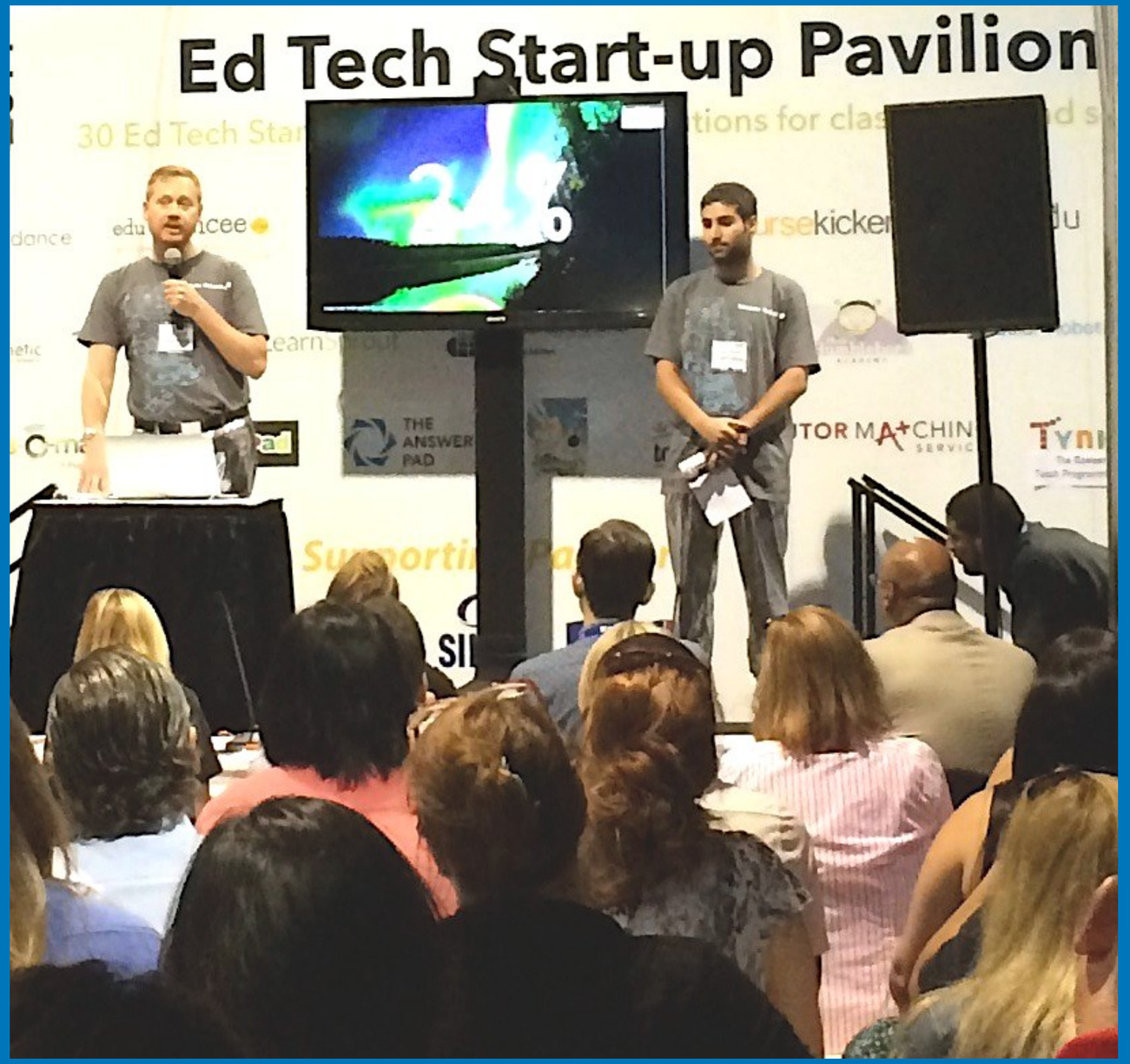
Josh Ajima - DesignMakeTeach.com

The Maker Movement


BETSEY ROSS

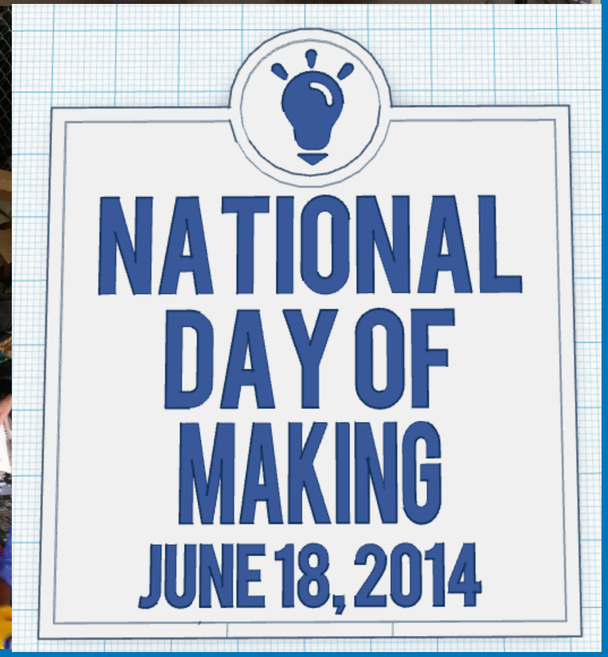



THE SATURDAY EVENING
POST
BEGINNING—A NEW
KELLAND SERIAL
Heart on Her Sleeve
EDGAR SNOW
REPORTS ON GERMAN
ATROCITIES
ROSIE



Attribution: Matthew Yohe at en.wikipedia

Maker Culture



Maker Movement

“We are all Makers.”

-Dale Dougherty

Makerspace is an idea

Learn by Making

What if...?

MAKERSPACE

LEARN BY MAKING

Makerspace Starter Kit

- -Recycle Bin
- -Crafting Supplies
- -Toy Boxes
- -Designer.io
- -Tinkercad.com
- -Scratch.mit.edu
- -MakeCode.com

Resources

- -DesignMakeTeach.com
- -bit.ly/meaningfulmakingfile
- -inventtolearn.com/resources
- -Instructables.com
- -Diy.org
- -Code.org
- -makered.org

Time

Space

Materials

Resources

Scaling Up the Makerspace

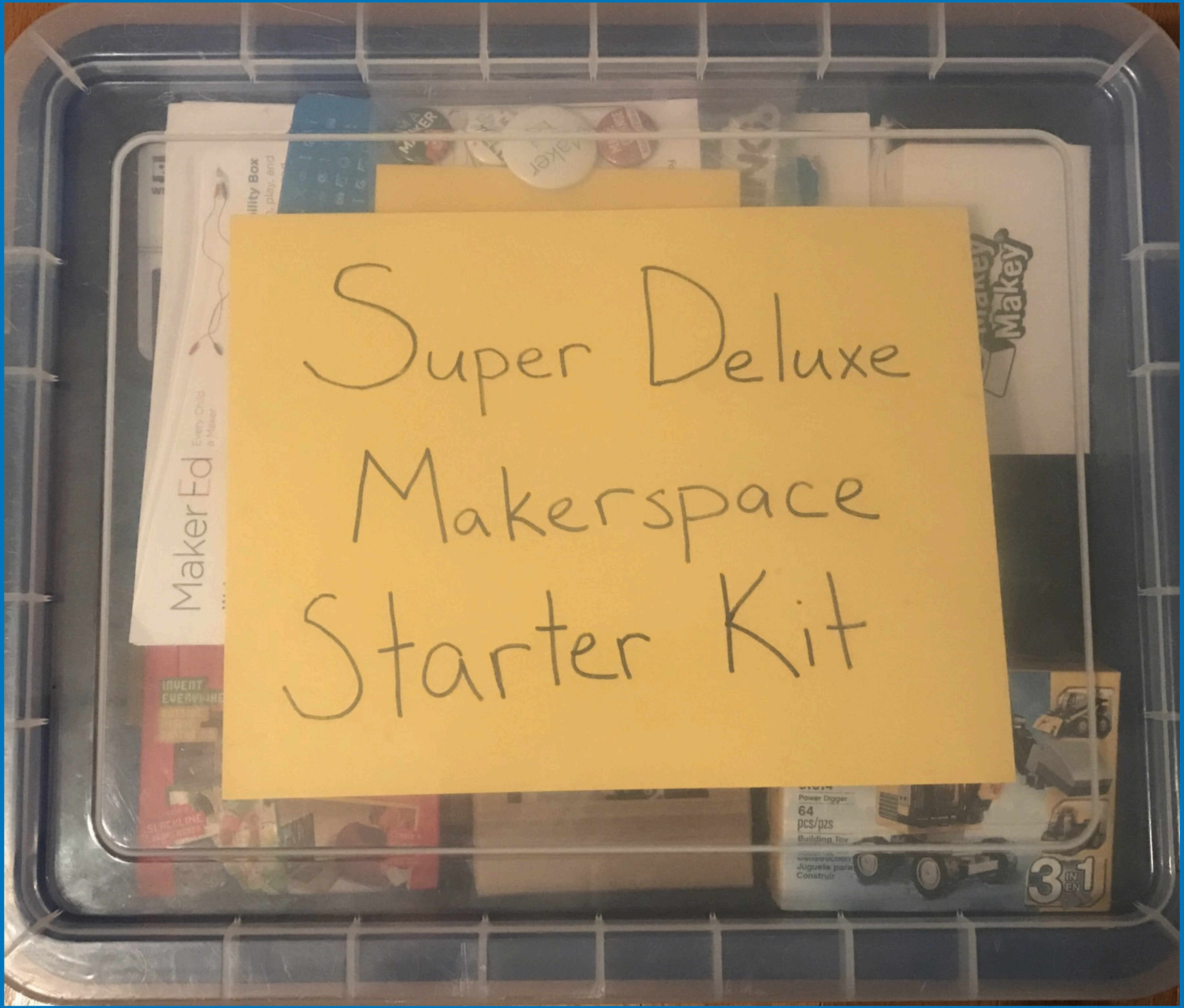
Makerspace

Josh Ajima
DesignMakeTeach.com

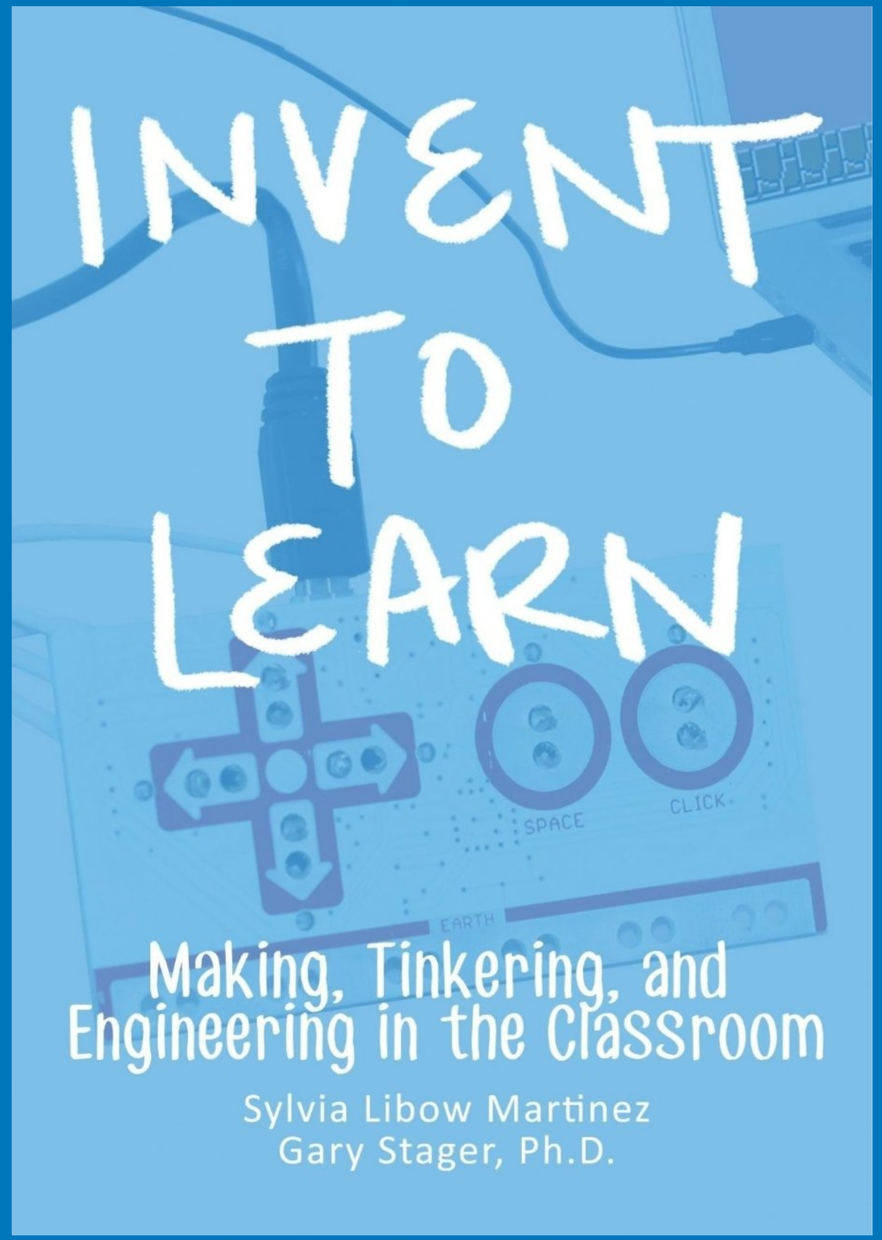
Akela Silkman
@AkelaSilkman

Follow

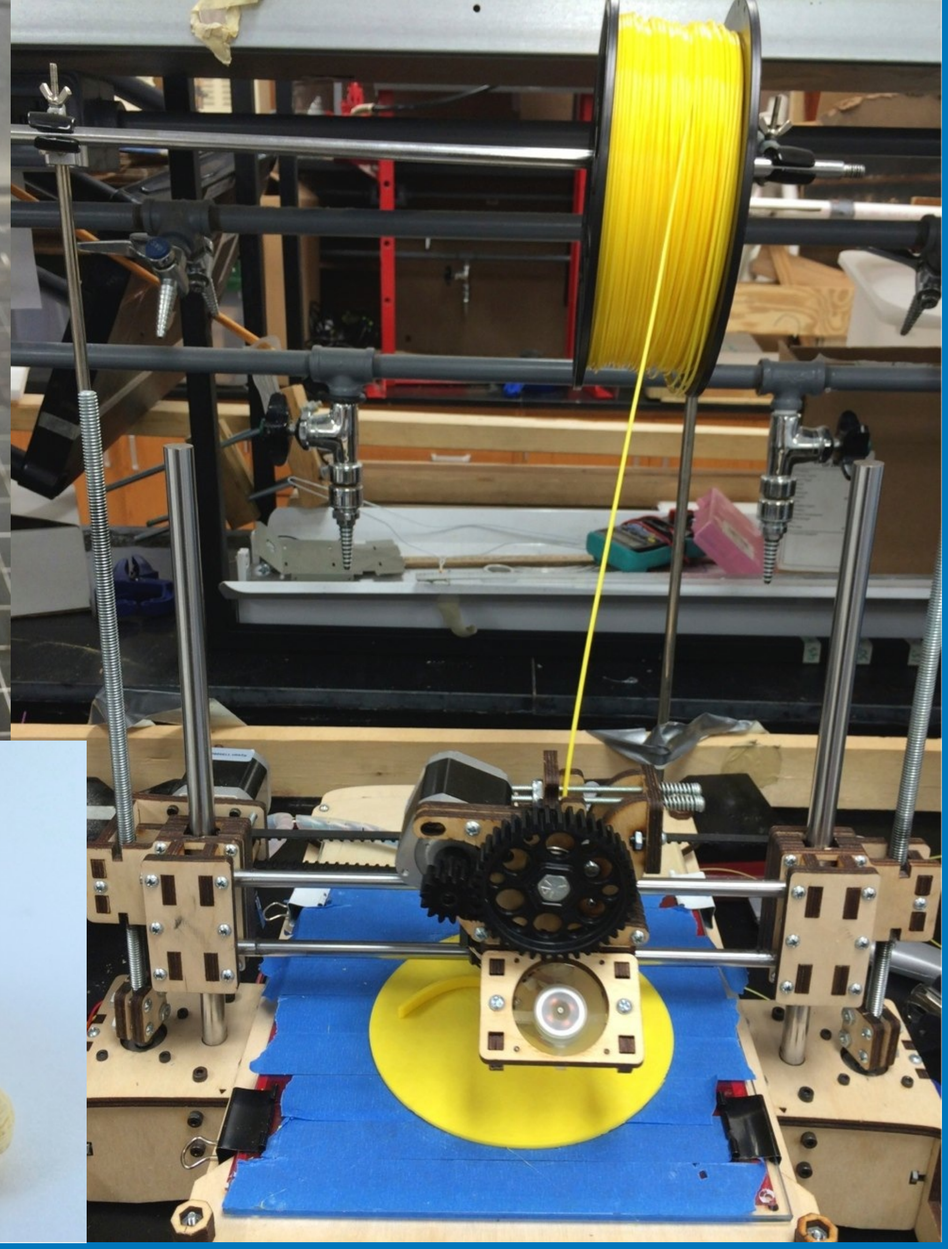
Post #VSTE Action Item #1:Establish Makerspace. BOOM! Done. Thank you @DesignMakeTeach #makersgottamake #makerspace


100
Makey Makey GO
Hobby
Hobby
CREATOR
Hi-Temp Project Pro
4" Magnetic Parts Holder

Super Deluxe
Makerspace
Starter Kit
Maker Ed
Makey Makey

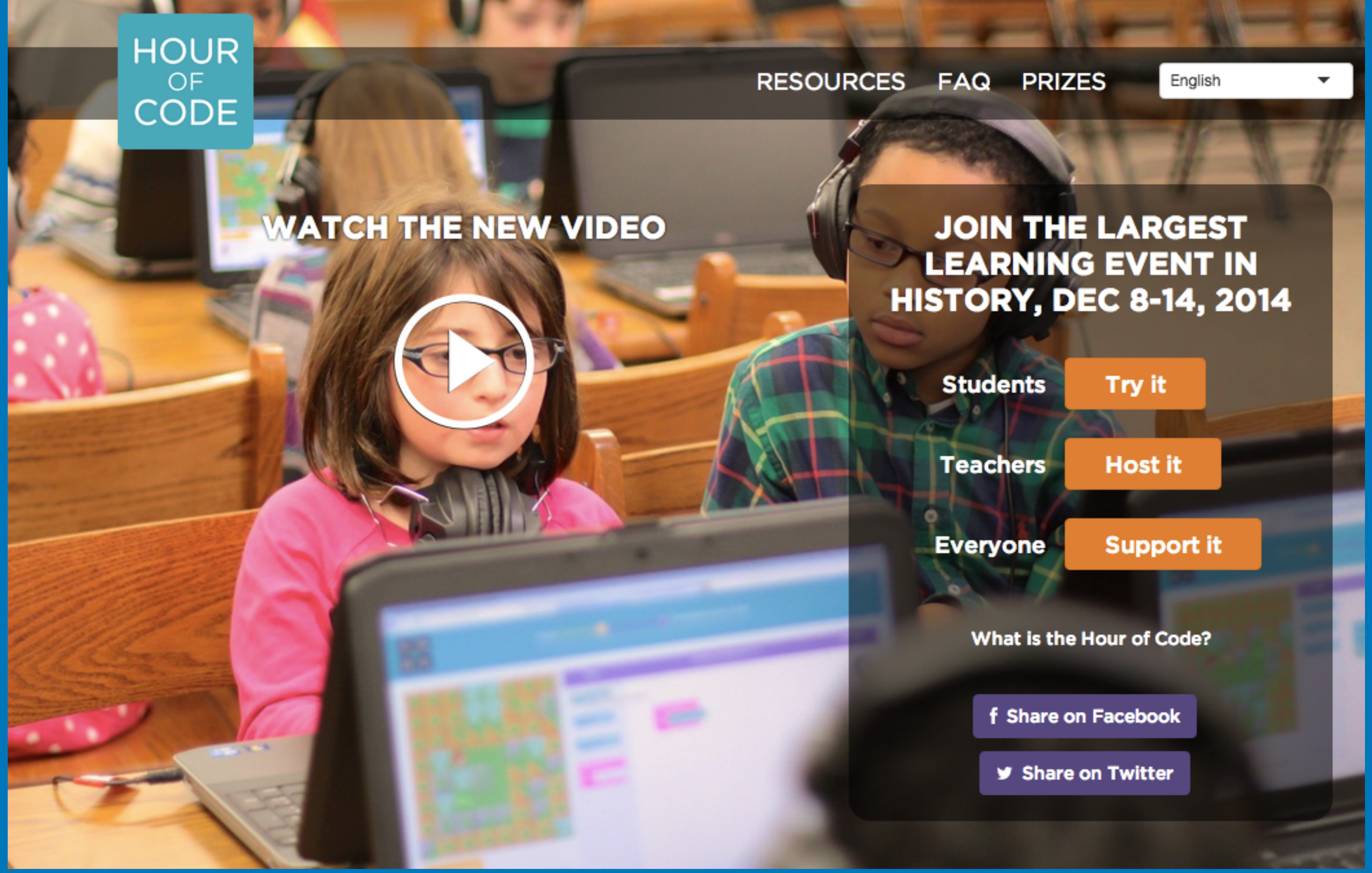
Mobile Makerspace



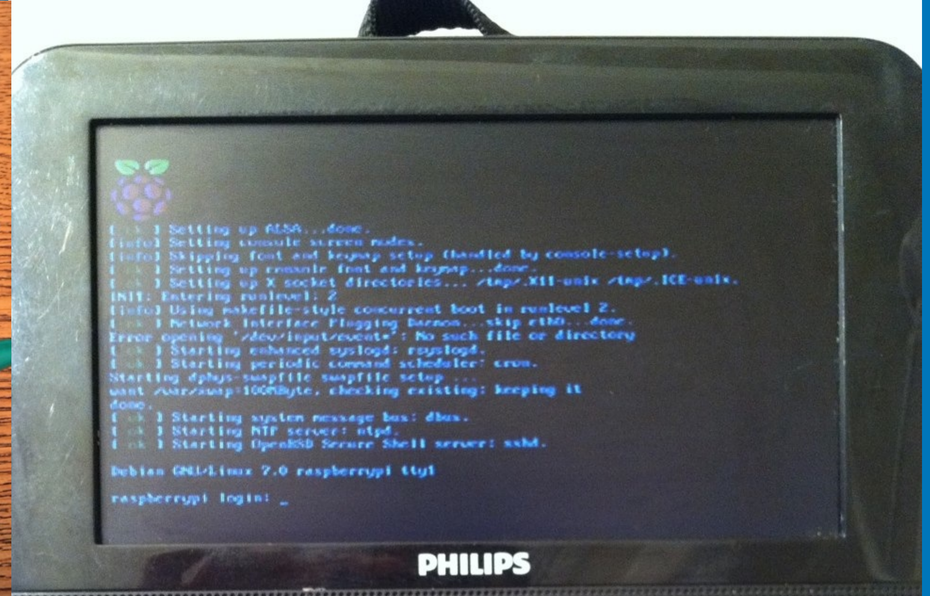
Learn by Making

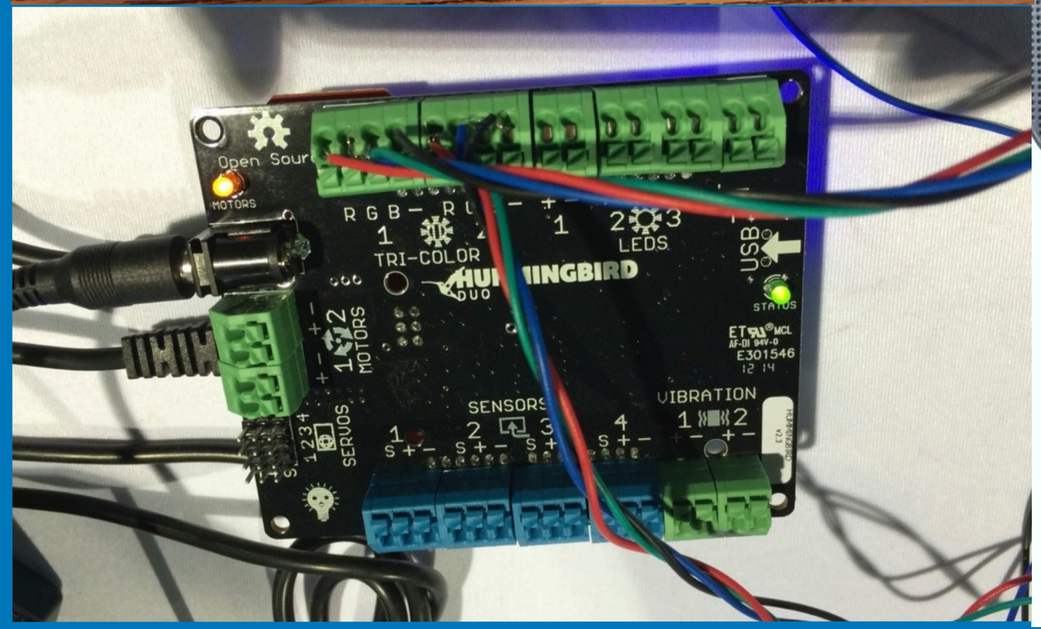


Digital Fabrication

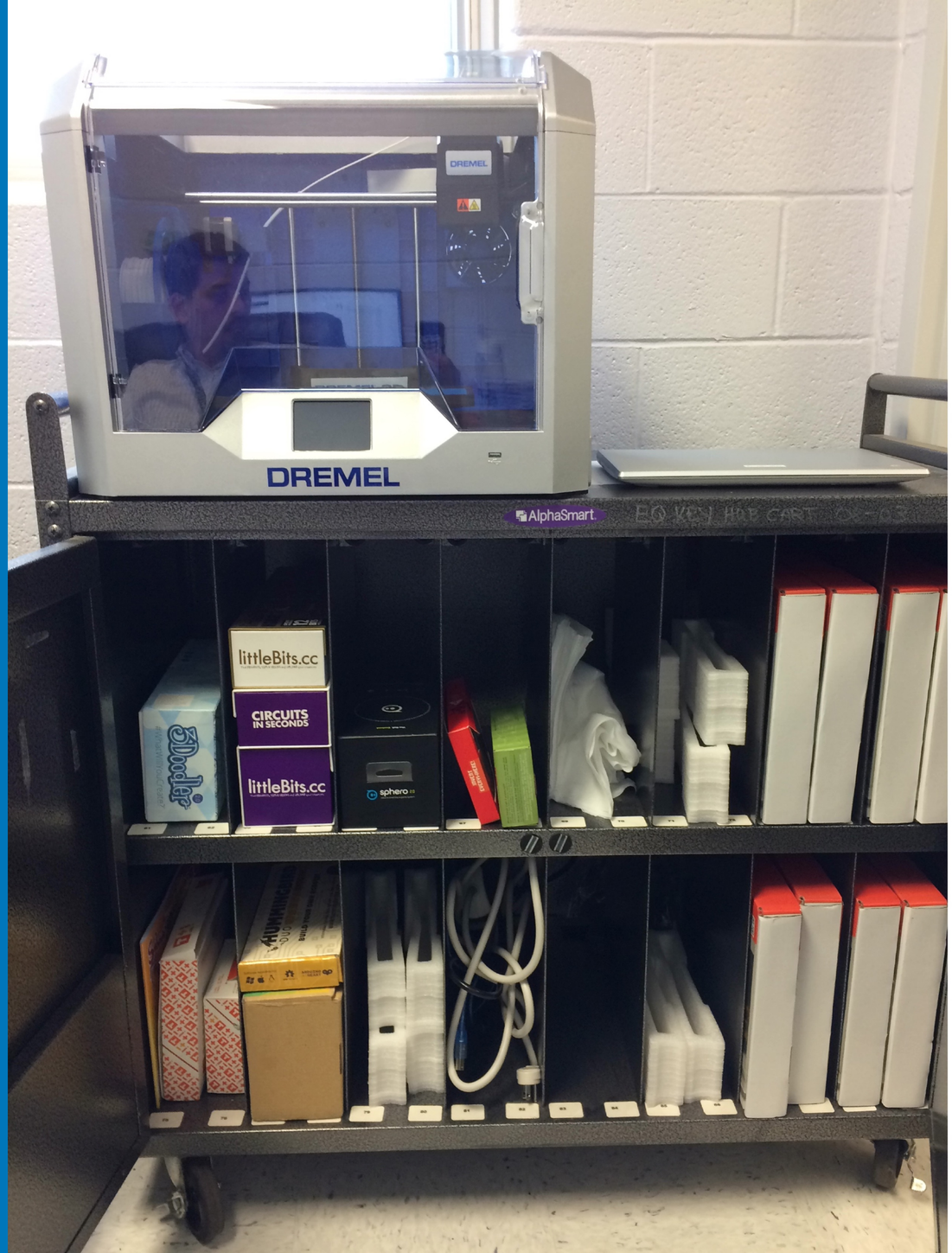


Programming



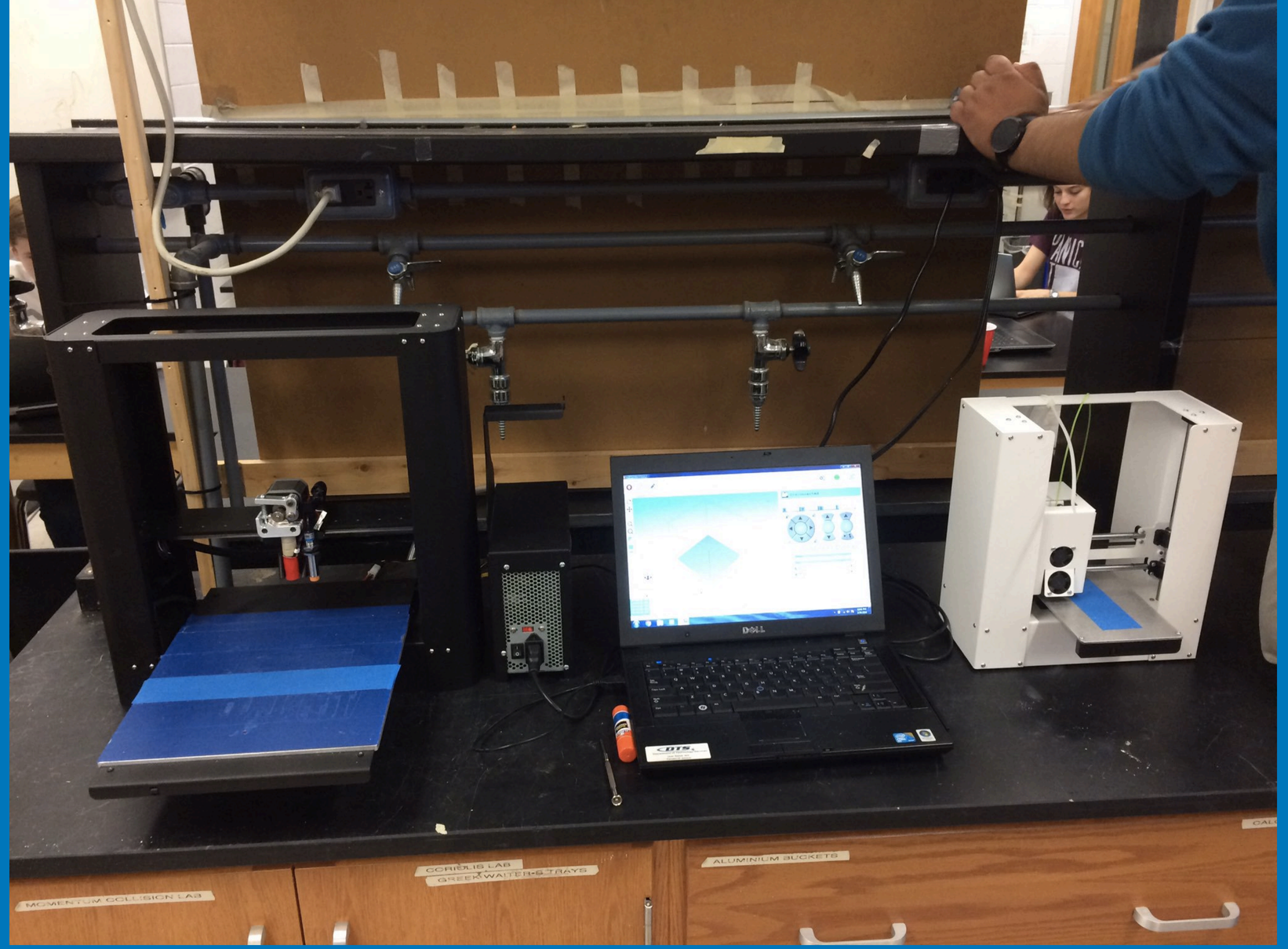


Physical Computing



Maker Cart Prototype

Library Makerspace



Classroom Makerspace

STEM Camp Makerspace

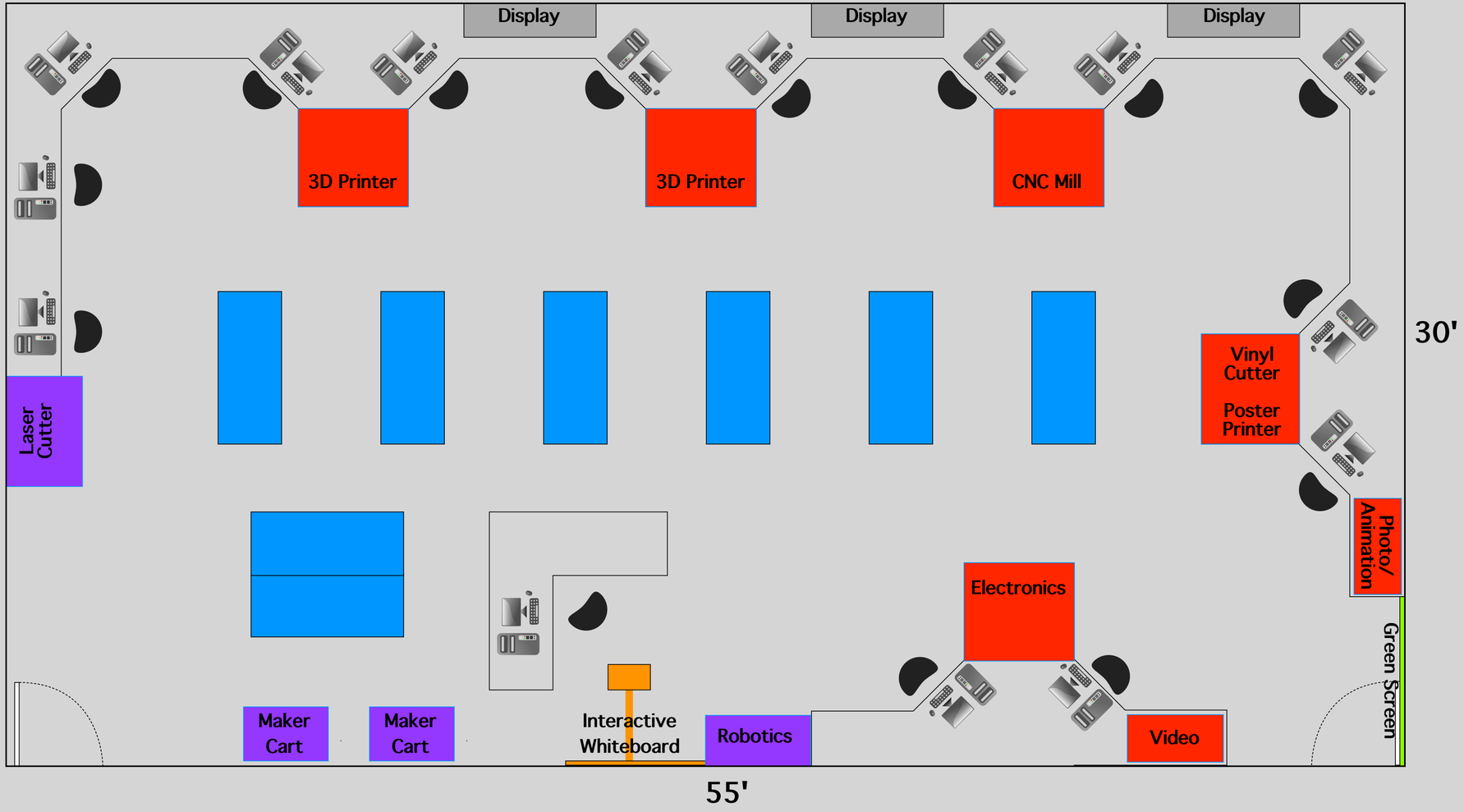
CTE MAKEOVER CHALLENGE

Calling on high schools to design makerspaces that strengthen next-generation career and technical skills.


zing
925585

Teacher PD in #DHSMakerspace 🍎

Dominion Makerspace



Design Station: Built-in furniture w/ power & network drops

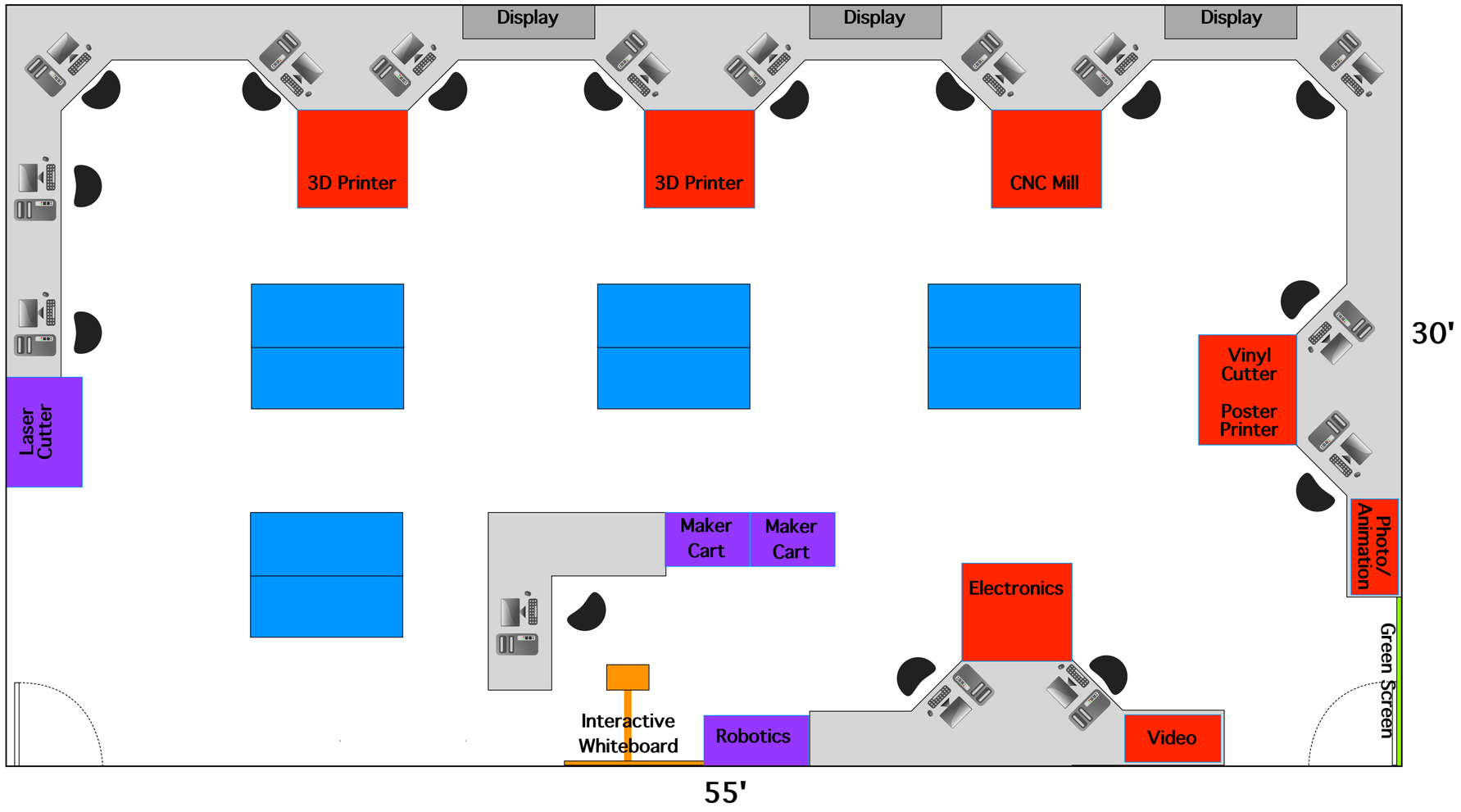
Maker Station: Built-in w/ power & under table storage

Wheeled Station: Mobile

Table: Free standing

3'

Large Group Projects



Design Station: Built-in furniture w/ power & network drops

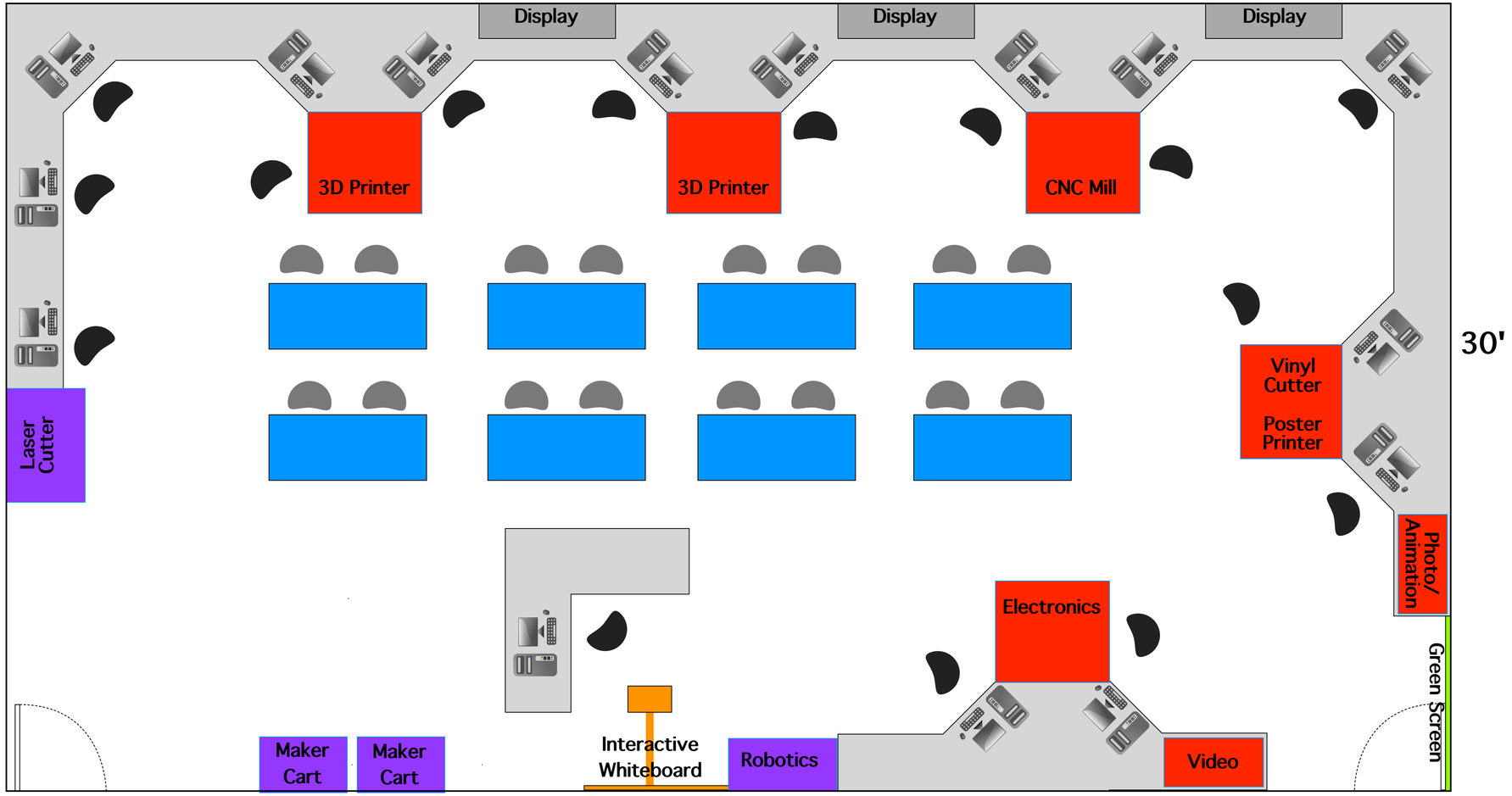
Maker Station: Built-in w/ power & under table storage

Wheeled Station: Mobile

Table: Free standing

3'

Presentation



Design Station: Built-in furniture w/ power & network drops

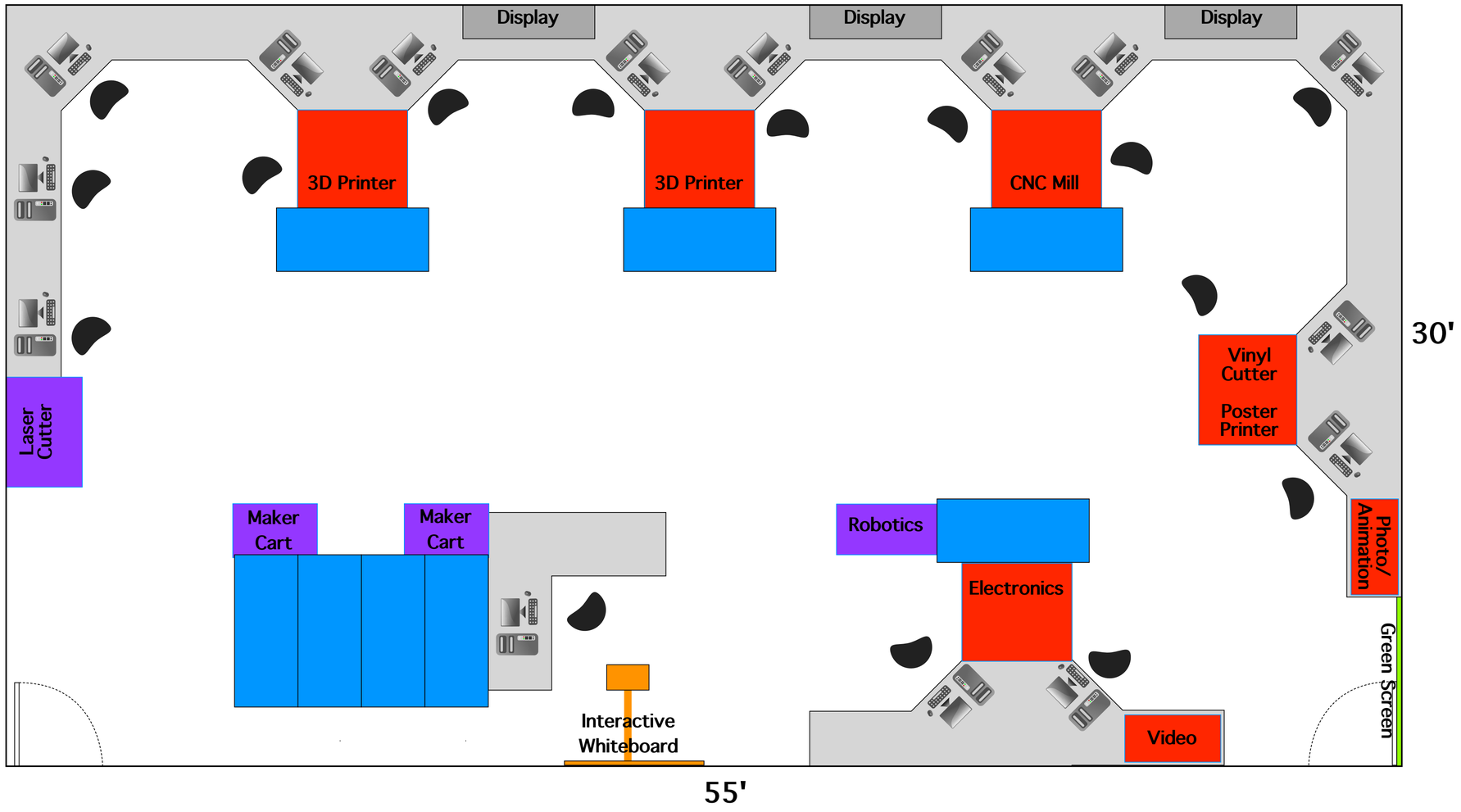
Maker Station: Built-in w/ power & under table storage

Wheeled Station: Mobile

Table: Free standing

3'

Competition



Design Station: Built-in furniture w/ power & network drops

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Wheeled Station: Mobile

Table: Free standing

3'

Lessons:

- Lesson 0: Orientation and Overview
  Kick off your Bootcamp experience by participating in orientation.
- Lesson 1: Making and 21st Century Skills
  Discover how making can strengthen skills that will allow students to succeed in the 21st century economy.
- Lesson 2: Learning through Doing
  Explore the topics and skills that can be taught using makerspaces and the projects, tools, and materials needed.
- Lesson 3: Plan It, Make It
  Draft the design, identify the right tools, and plan how you will construct your makerspace.
- Lesson 4: Identifying and Engaging Your Community
  Consider how your community can contribute to building and sustaining your makerspace.
- Lesson 5: Budgeting and Resources
  Make your plans a reality by drafting a budget and coming up with ways to gather the resources you will need to build a sustainable makerspace.

http://www.ctemakeoverchallenge.com/cte-makeover-bootcamp/

Innovation at the Academies of Loudoun

ACADEMIES OF LOUDOUN

EXPLORE • RESEARCH • COLLABORATE • INNOVATE

The mission of the Academies of Loudoun is to empower students to **explore, research, collaborate, innovate,** and to make meaningful contributions to the world in the fields of **science, technology, engineering and mathematics**.

- Academy of Engineering & Technology (AET)
- Academy of Science (AOS)
- Monroe Advanced Technical Academy (MATA)

Opening Fall 2018

The Academies of Loudoun

Creating Increased Opportunities for Exploration, Innovation and Advancement

AET

Advanced Technology & Engineering
emphasizing Integration and Application
2 to 4 year programs

AOS

Advanced Science & Math
emphasizing Research
4 year program

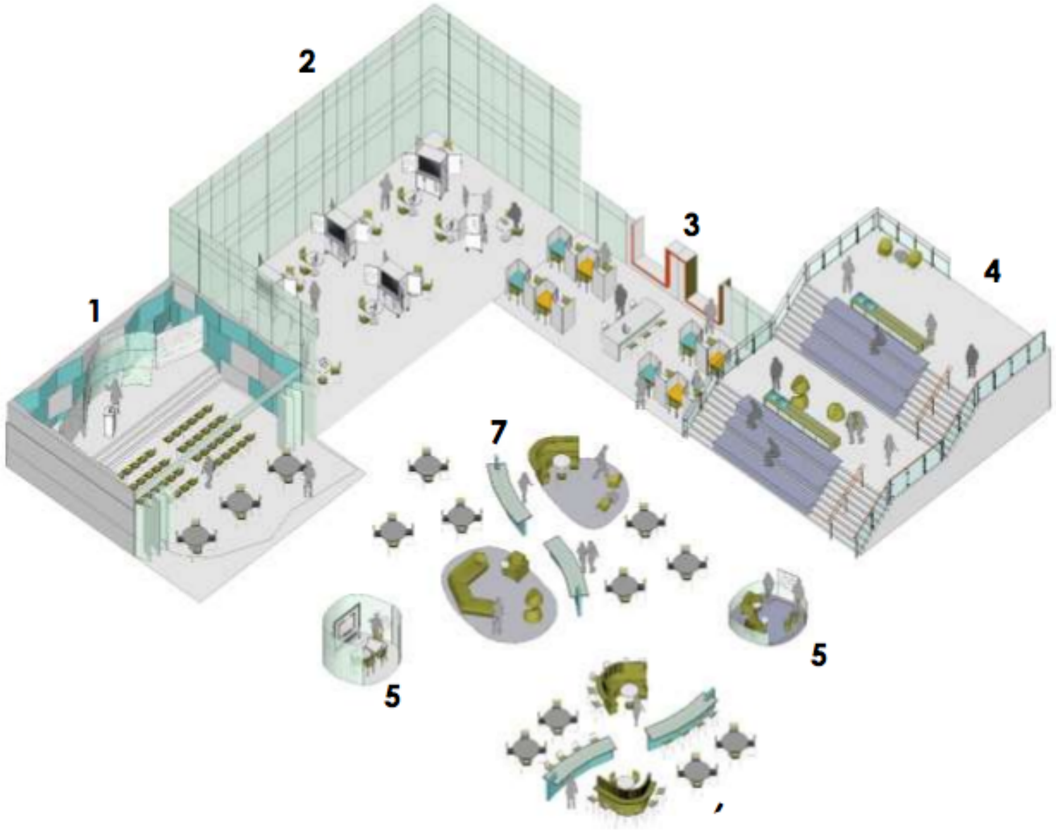
MATA

Career & Technical Education
(CTE) and Workplace Readiness
emphasizing Practical Skills
and Certification
1 to 2 year programs

Flexible Course Enrollment & Advanced Coursework in Mathematics & Humanities to facilitate enrollment, emphasizing Dual Enrollment and AP

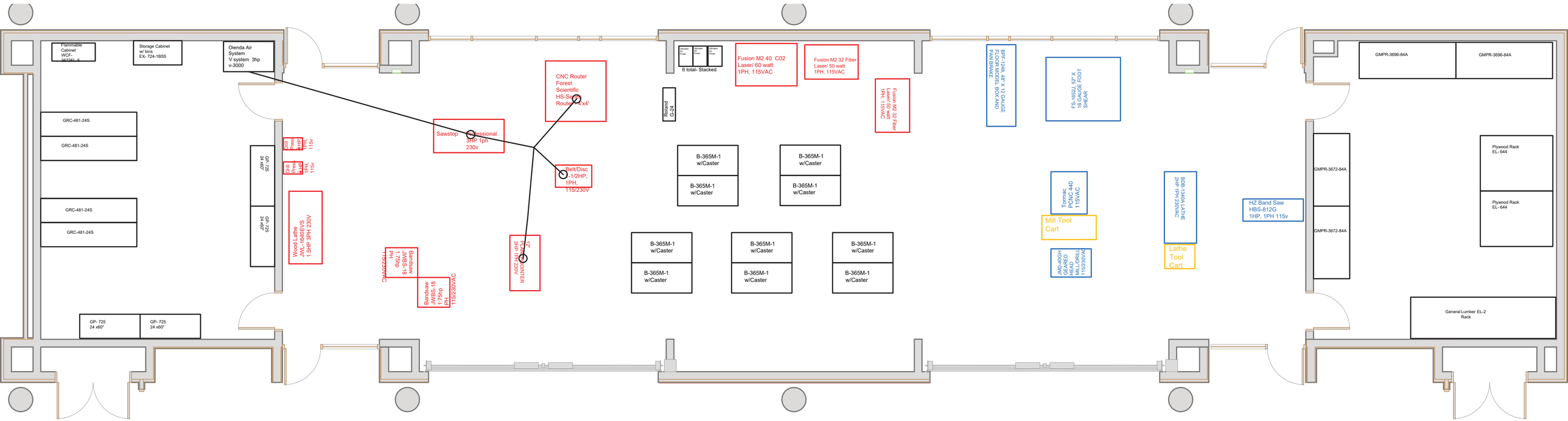
1,000-1,600 facility capacity

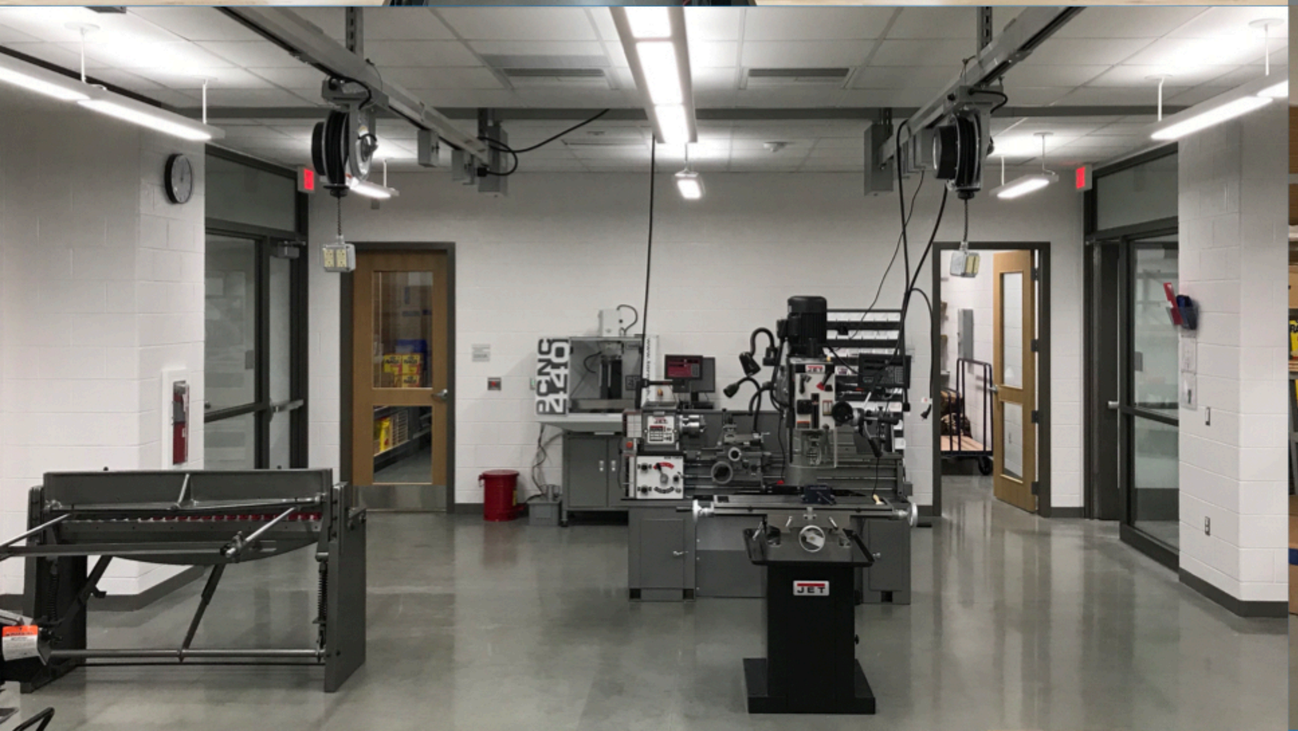
INNOVATION COMMONS

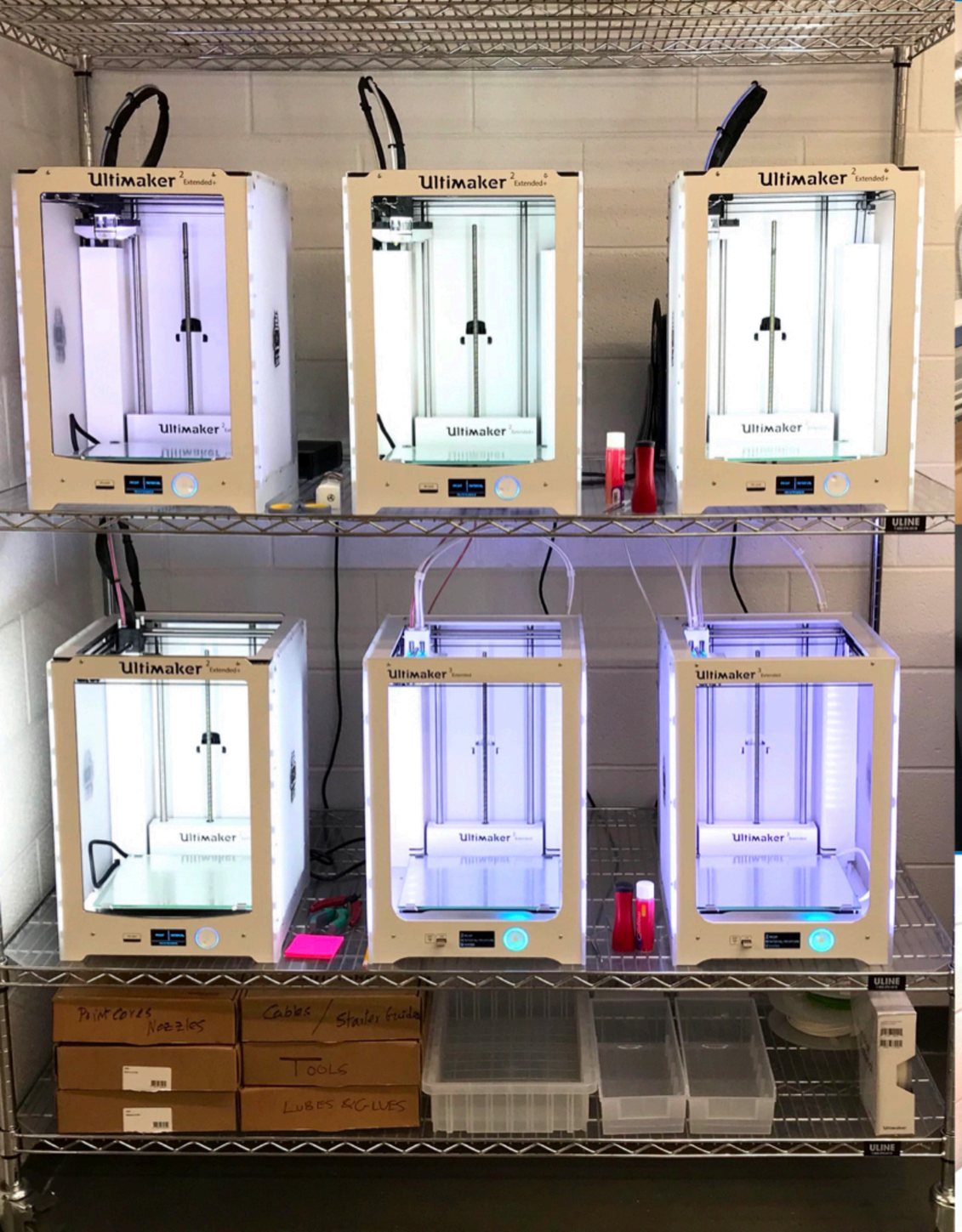


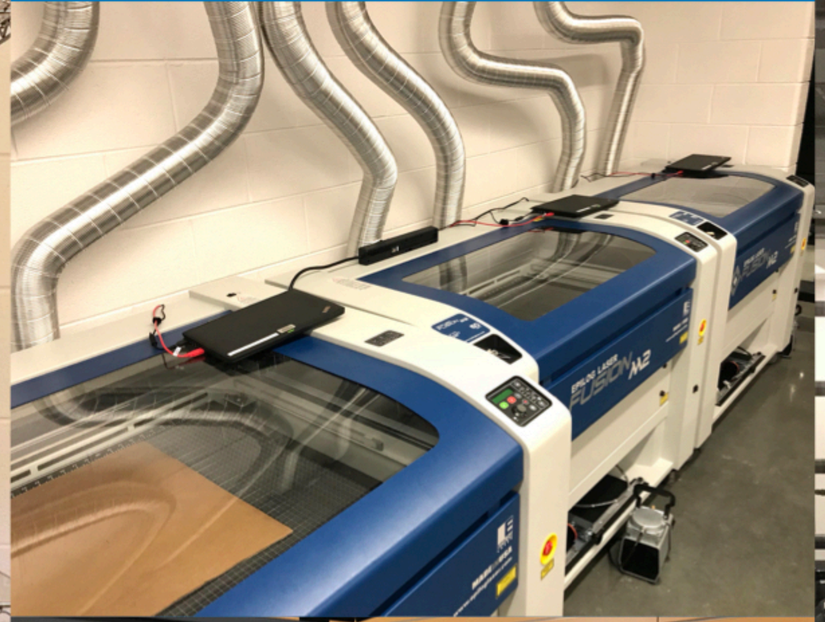
- 15,480 S.F.
- HIGH FLEXIBILITY
- HIGH INFRASTRUCTURE
- INTENTIONAL TRANS-DISCIPLINARY SPACE

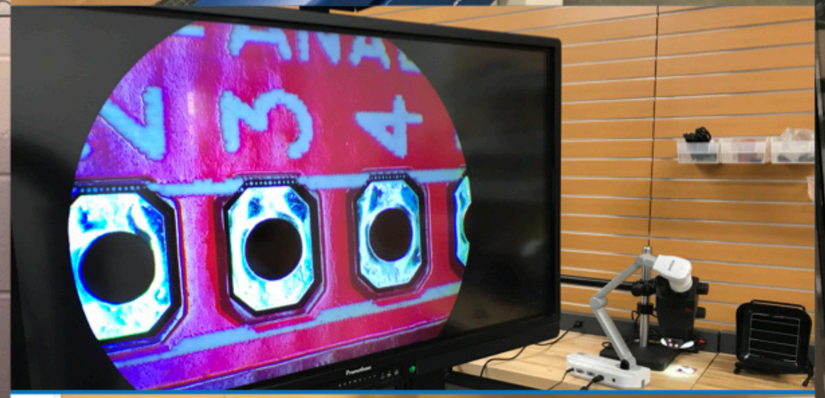
1. LEARNING THEATER
2. MAKER SPACE
3. TECHNOLOGY STATION
4. LEARNING STAIR + POSTER GALLERY
5. TEAM ROOMS
6. COLLABORATION SPACE
7. DINING + SOCIAL


Flammable Cabinet WCF-3672FL-S
Storage Cabinet w/ bins EK- 724-1BS5
Olenda Air System V system 3hp v-3000
GRC-481-24S
GRC-481-24S
GRC-481-24S
GRC-481-24S
GP- 725 24 x60"
GP- 725 24 x60"
GP- 725 24 x60"
GP- 725 24 x60"
Drill Press DP-1 1/2HP 1PH 115v
Drill Press DP-1 1/2HP 1PH 115v
Wood Lathe JWL-1640EVS 1.5HP 3PH 230V
Bandsaw JWBS-18 1.75hp 1PH 115/230VAC
Bandsaw JWBS-18 1.75hp 1PH 115/230VAC
Sawstop Professional 3HP 1ph 230v
CNC Router Forest Scientific HS-Series Router 5'X4'
Belt/Disc -1/2HP, 1PH, 115/230V
12" PLANER/JOINTER 3HP 1PH 230V
Roland GS24
6 total- Stacked
Fusion M2 40 C02 Laser/ 60 watt 1PH, 115VAC
Fusion M2 32 Fiber Laser/ 50 watt 1PH, 115VAC
Fusion M2 32 Fiber Laser/ 50 watt 1PH, 115VAC
B-365M-1 w/Caster
B-365M-1 w/Caster
B-365M-1 w/Caster
B-365M-1 w/Caster
B-365M-1 w/Caster
B-365M-1 w/Caster
B-365M-1 w/Caster
B-365M-1 w/Caster
B-365M-1 w/Caster
BPF-1246 48" X 12 GAUGE FINGER BRAKE BOX AND PAN BRAKE
FS-1663J 63" X 16 GAUGE FOOT SHEAR
Tormac PCNC 440 115VAC
Mill Tool Cart
JMD-40GH GEARED HEAD MILL/DRILL 115/230VAC
SBS-1054VLTHE 2HP 1PH 230VAC
Lathe Tool Cart
GMPR-3696-84A
GMPR-3696-84A
GMPR-3672-84A
GMPR-3672-84A
HZ Band Saw HBS-812G 1HP, 1PH 115v
Plywood Rack EL- 644
Plywood Rack EL- 644
General Lumber EL-2 Rack

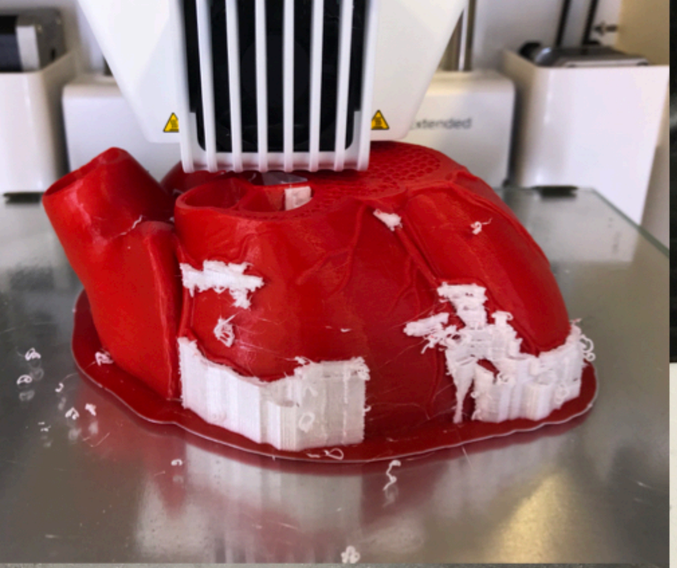



Ultimaker 2 Extended+
Ultimaker 2 Extended+
Ultimaker 2 Extended+
Ultimaker 2 Extended+
Ultimaker 3
Ultimaker 3
Print Cores Nozzles
Cables / Stainless Guides
Tools
Lubes & Glues
ULINE


EPILOG LASER FUSION M2

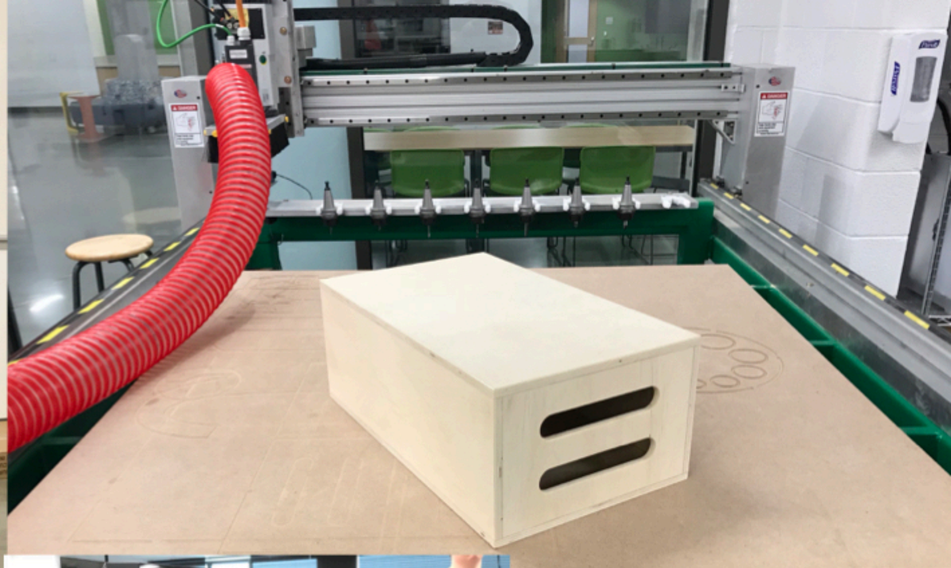



CODE KIT
CODE KIT




Plant Sale
MATA


HEINZ
ESTD 1869 ESTD
BAKED
BEANS
in tomato sauce
57
VARIETIES




@PXRXVI

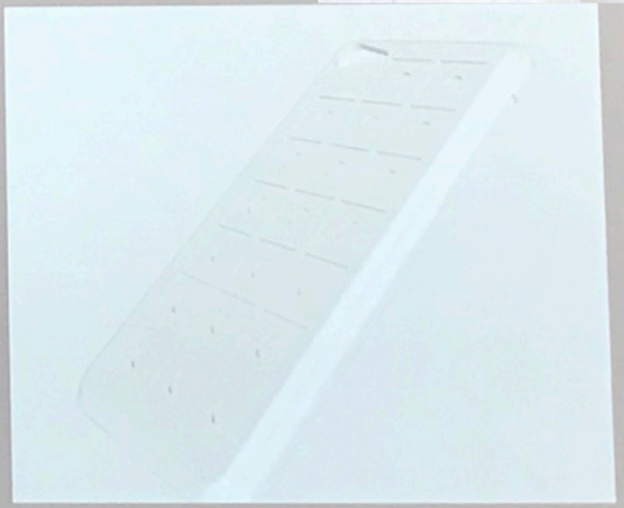

ACADEMIES OF LOUDOUN
MATA CYBERSECURITY


MATA Academy 2019
MATA Academy 2019


Franco

Our Solution

- Interchangeable phone case
- Waffle like design
- Squares with various images



Desmos Stickers

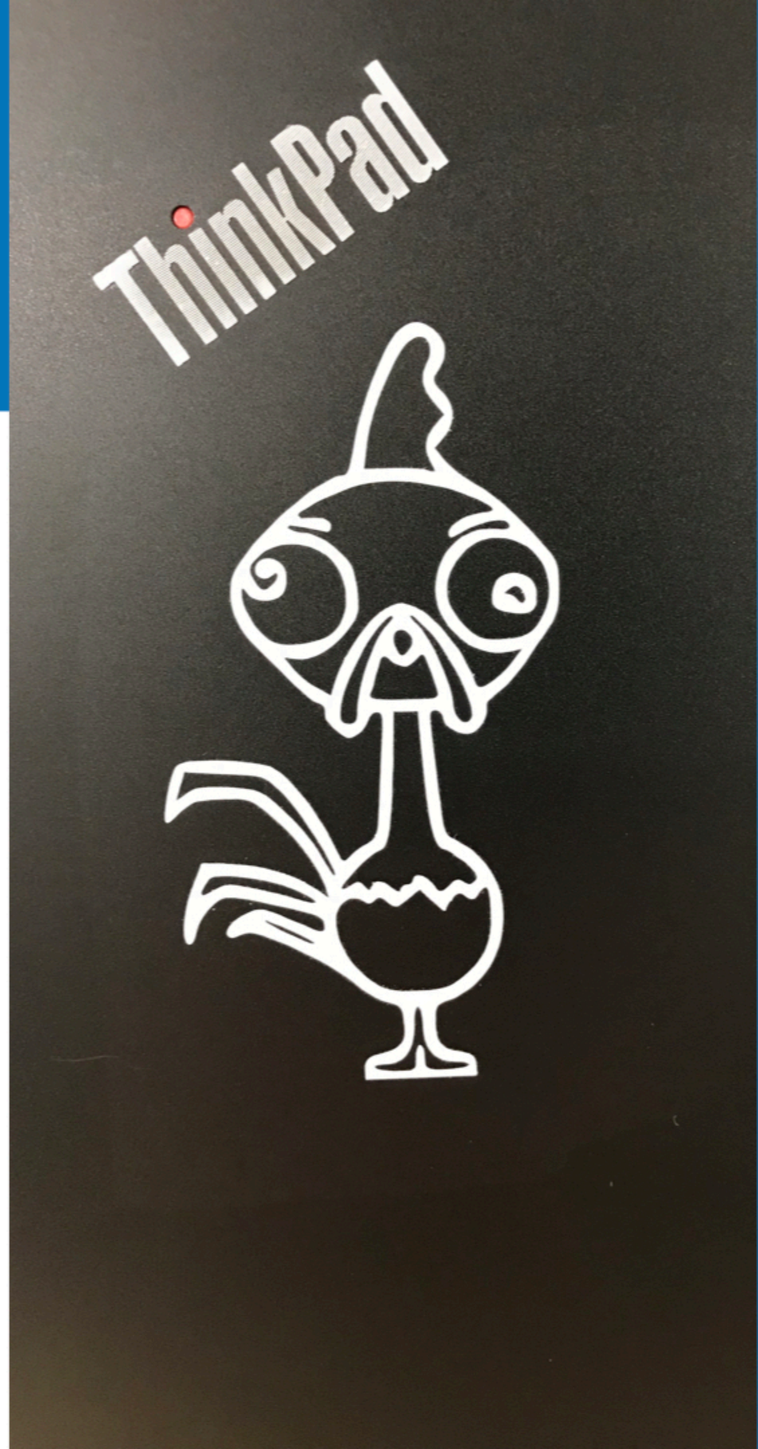
- **Parent Functions** - At a minimum, use **five** of the eight parent functions listed below.

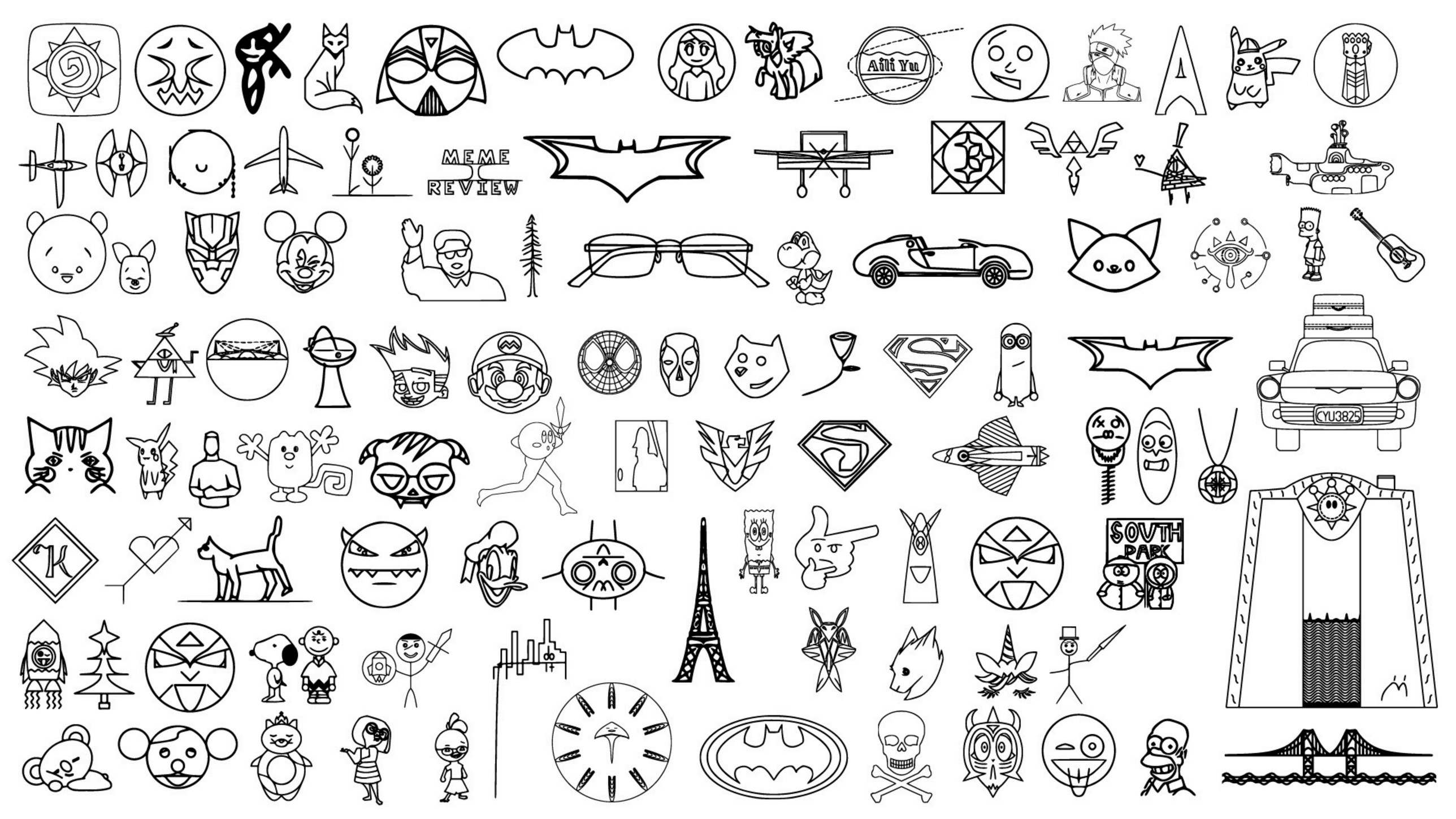
  - ❑ $y = x$
  - ❑ $y = |x|$ (type "abs(" to get an absolute value function)
  - ❑ $y = x^2$
  - ❑ $y = \sqrt{x}$ (type "sqrt(" to get a square root function)
  - ❑ $y = x^3$
  - ❑ $y = x^{1/3}$
  - ❑ $y = 1/x$
  - ❑ $y = a^x$

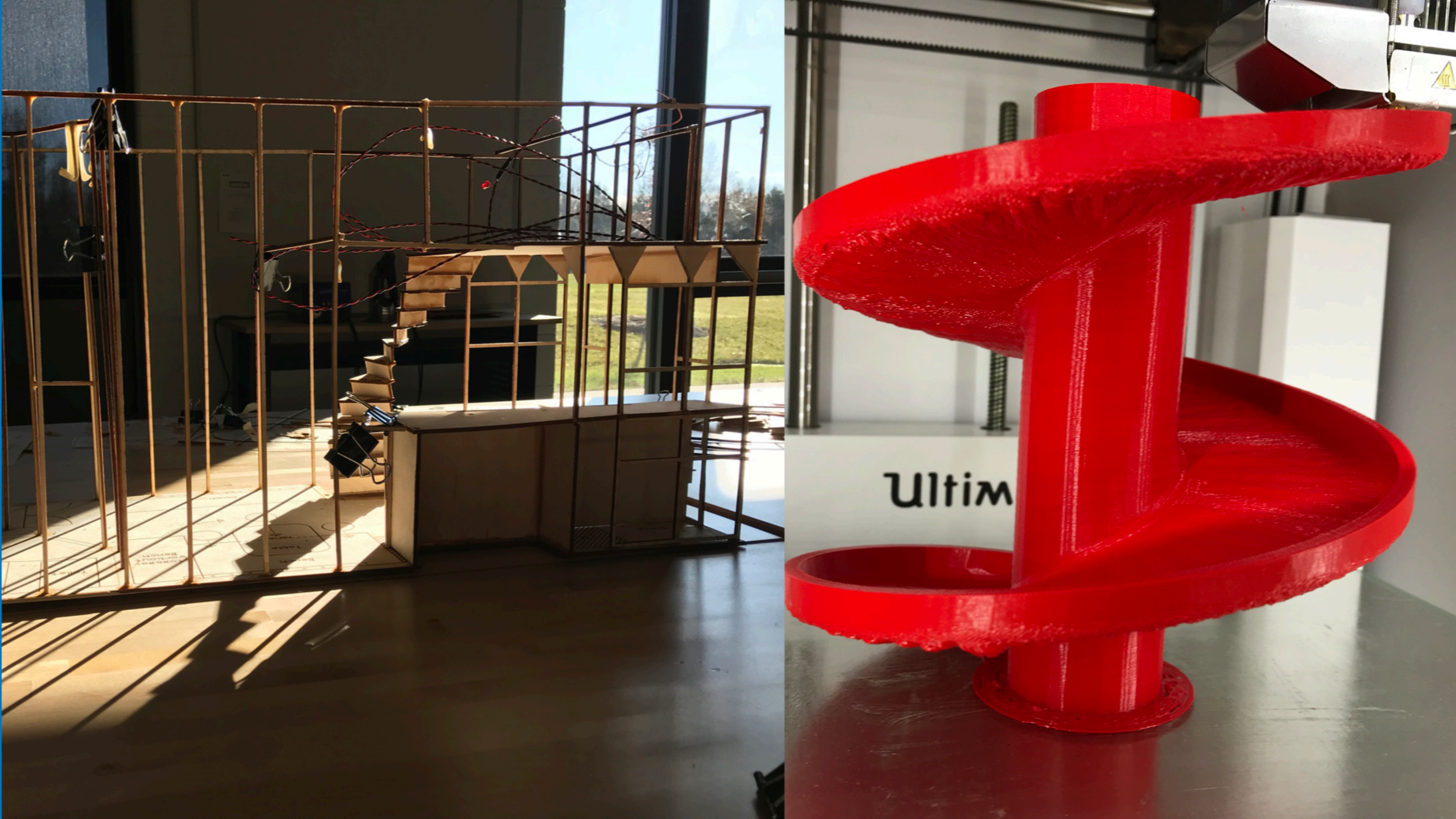
- **Transformations** - Utilize **at least one of each** transformation listed below.

  - ❑ Stretch/Compression
  - ❑ Vertical Translation
  - ❑ Horizontal Translation
  - ❑ Reflection (Either Axis)

- **Summary** - Create a one paragraph summary in Desmos explaining your strategy in creating in your project, **with specific reference to each of the transformations listed above.**

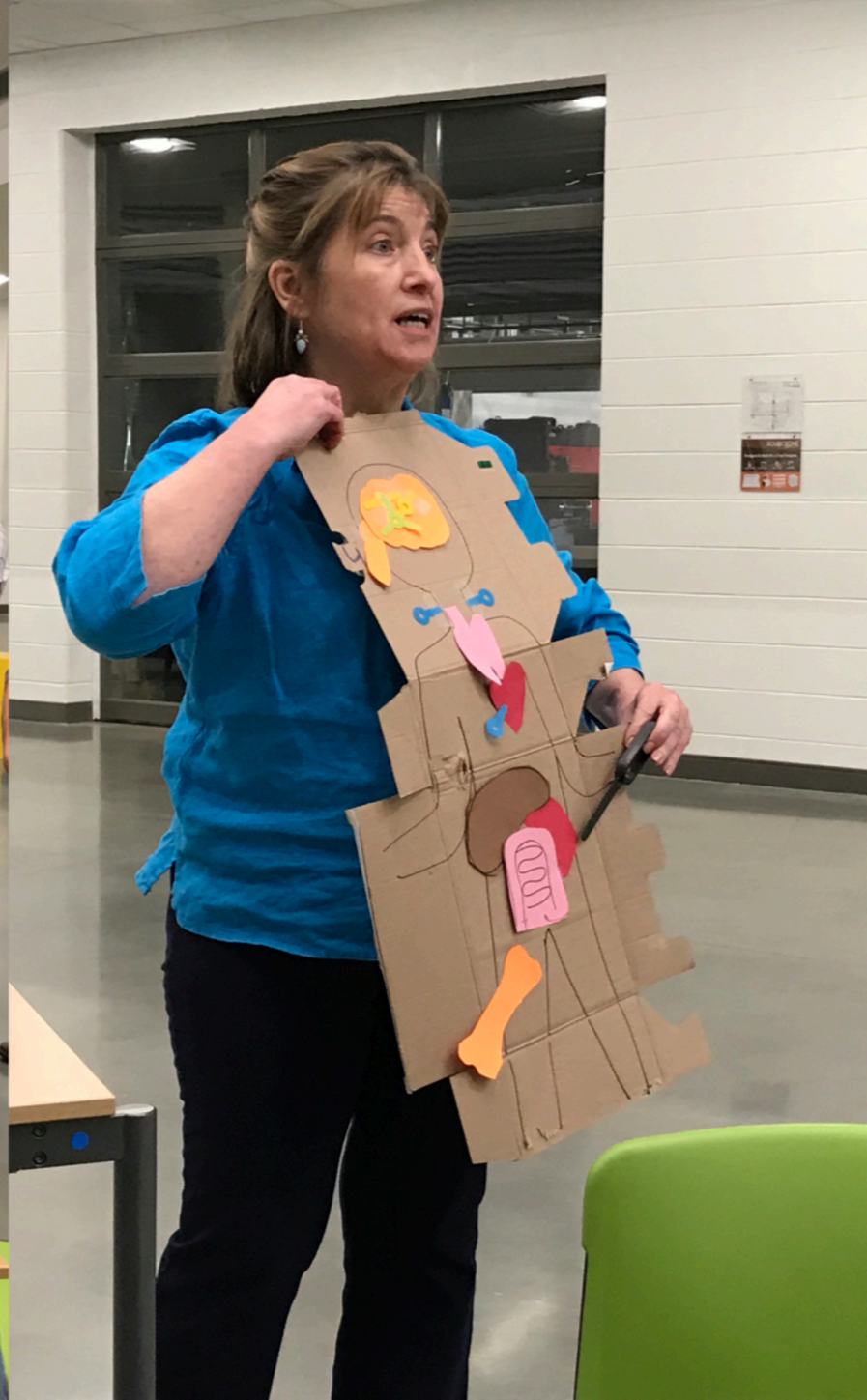



Aili Yu
MEME REVIEW
CYU3825
SOUTH PARK

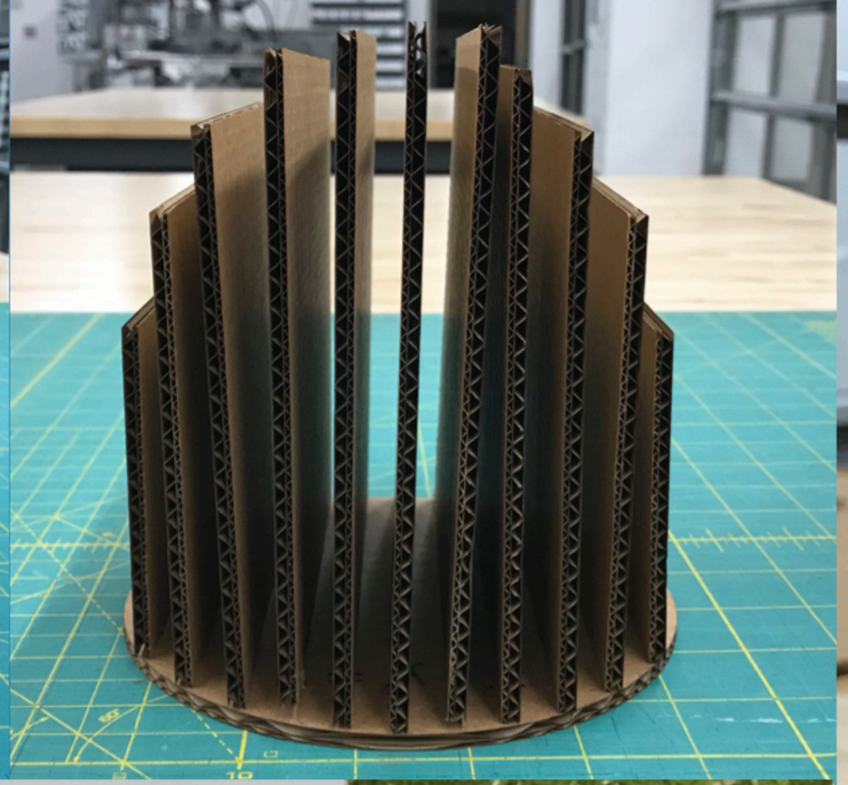

Ultim

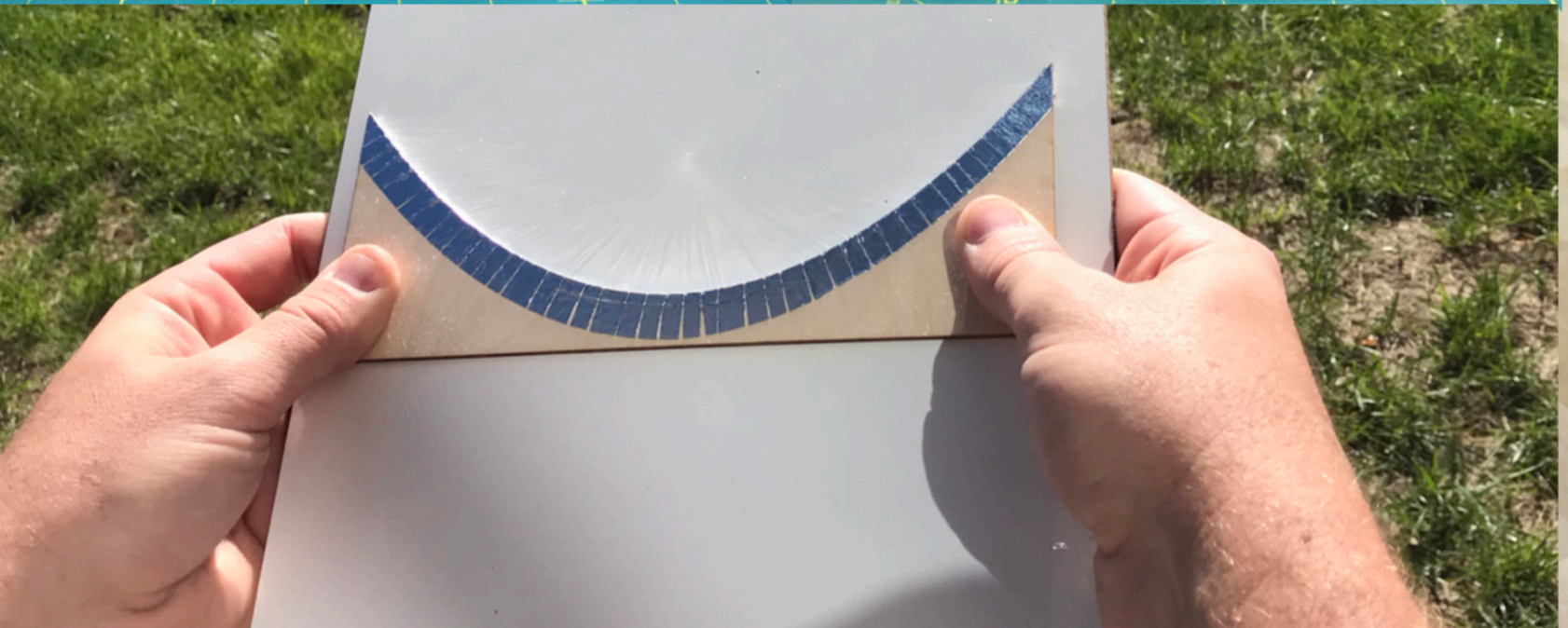

WARNING: ONLY OPERATE BED WITH PERSONS CLEAR OF POWER
CAUTION: UNPLUG BED DURING SERVICE OR CLEANING. INSUR
CALE USE: BEFORE PATIENT PLACEMENT: 1. Press
To zero; press & hold
until "00.0" is displayed. DO NOT T
FLASHING & A "BEEP" SOUNDS. 4. Place the patient on the bed.
2. Press and release
3. Weight is displayed in "lb" or "kg".
EVENT SERIOUS INJURY.
OUTSIDE THE TENT.
required items on bed.
UNTIL "CALC" STOPS
TIENT: 1. Press
to turn on.

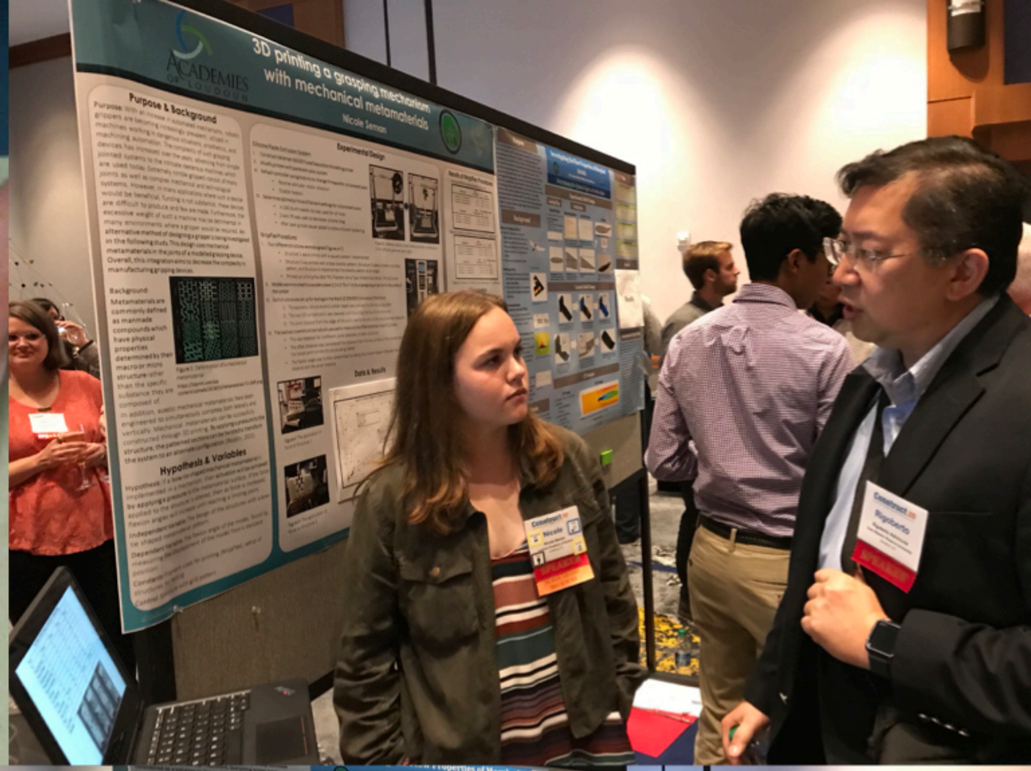

Challenge
costume,




x = -1.0
x = -1.5
x = -2.0
x = -2.5



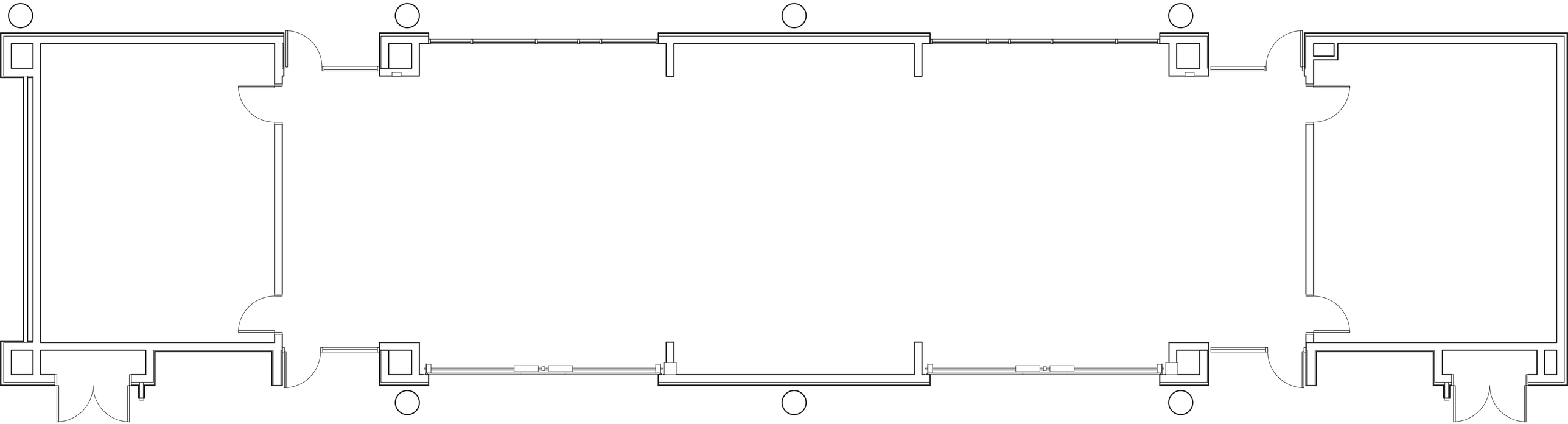



3D printing a grasping mechanism with mechanical metamaterials
Purpose & Background
Hypothesis & Variables


The Effect of Filament Size in Reinforcement Structures on SMA Actuator Performance
Purpose
Background
Procedure Overview
Procedure
Design of Actuator
Data
Results
Conclusion
SPEAKER


Airfoils
Determining the Optimal Rigid to Flexible Ratio
Background
Results
Ultimaker
SPEAKER

Makerspace Safety



Virginia DOE Safety Resources

-VDOE Safety in Science Teaching (2018)
http://www.doe.virginia.gov/instruction/science/index.shtml

-The Safety Best Practice Guide for CTE
http://www.doe.virginia.gov/instruction/career_technical/technology/index.shtml

- Power
- Lighting
- Ventilation
- Fume Extraction
- Dust Extraction
- Eye Wash/Shower
- Sink
- Sight Lines
- Chemical Storage
- Sound
- Green Zone
- Red Zone
- Safety Zones
- First Aid
- Fire Extinguisher
- PPE
- Traffic Flow
- Supervison
- Training
- Acknowledgement

Storage

- Tools
- Materials
- Projects

Display

- Student Work
- Signage
- Tutorials
- AV

- Flexibility
- Mobility
- Collaboration
- Design Space
- Work Space
- Sharing

Reference Guide 6 page summary ($)

Making and Makerspaces in Education

Essential Reading List

- Invent to Learn
- Meaningful Making 1 & 2
- The Space
- Make Space
- Safer Makerspaces, Fab Labs, and STEM Labs

Makerspace Playbook
https://makered.org/wp-content/uploads/2014/09/Makerspace-Playbook-Feb-2013.pdf

Starting a FabLab
https://fabfoundation.org/getting-started/#fab-lab-questions

CTE Makeover Challenge Bootcamp
http://www.ctemakeoverchallenge.com/cte-makeover-bootcamp/

MIT Edgerton Center: Makerspace Resources for K12 Educators
http://k12maker.mit.edu/

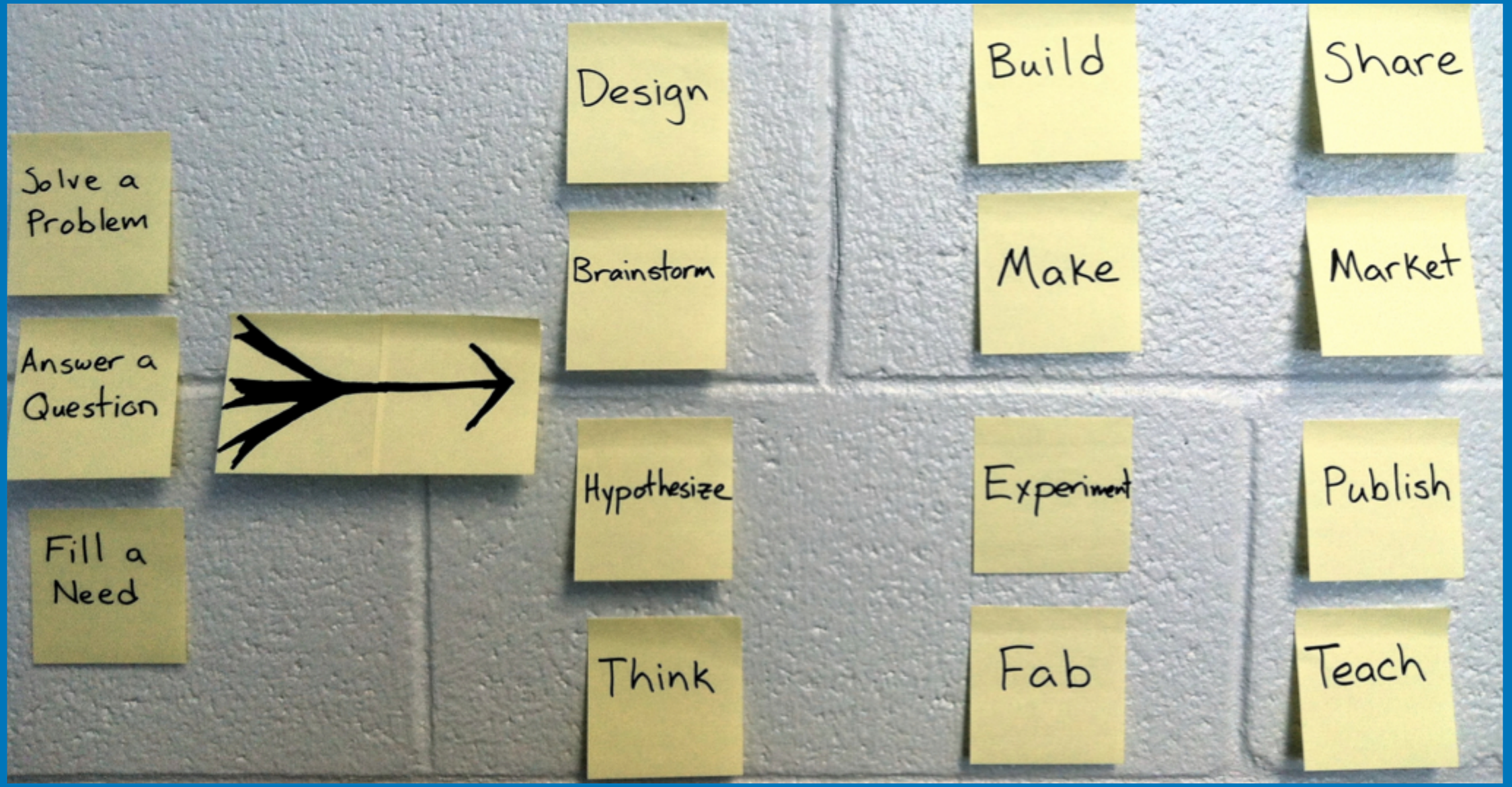
Reflection

Turn to a partner and describe how making is part of the learning environment you are planning.

Makerspace, Innovation & Safety

Josh Ajima
@DesignMakeTeach

A MAKER EDUCATION MODEL



Josh Ajima - DesignMakeTeach.com

DIGITAL FABRICATION TOOLS

2D Printer/Plotter
Embroidery Machine
Cutting Plotter/Vinyl Cutter
3D Printer
Laser Cutter
CNC

Josh Ajima - DesignMakeTeach.com

OTHER CATEGORY

Plasma Cutter
Water Jet: Wazer
Robotic Router: Shaper Origin