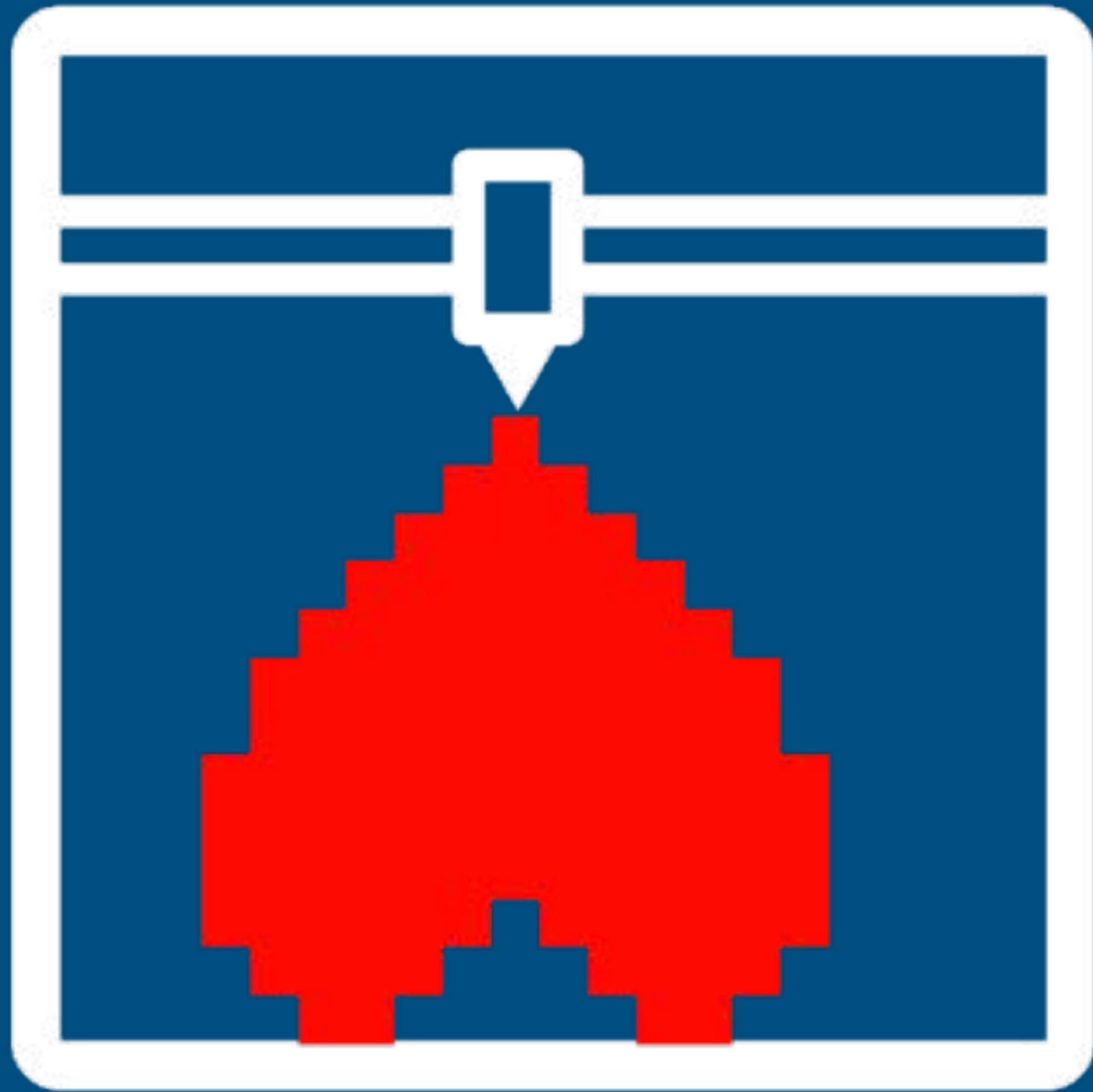


# 3D Printing Projects that Matter



**Josh Ajima**

**DesignMakeTeach.com**



# Bell Ringer

What 3D printer do you have and what are you printing?

(bonus for photos)

Share

-with the person next to you and/or

<https://padlet.com/designmaketeach/2g9tfofkxbrc>



# 0 Things

**DesignMakeTeach**





-Ali (Radi-Allahu anhu)





**Thingiverse**

# SEARCH RESULTS

0 results matching Martin Luther King







**Thingiverse**

## **SEARCH RESULTS**

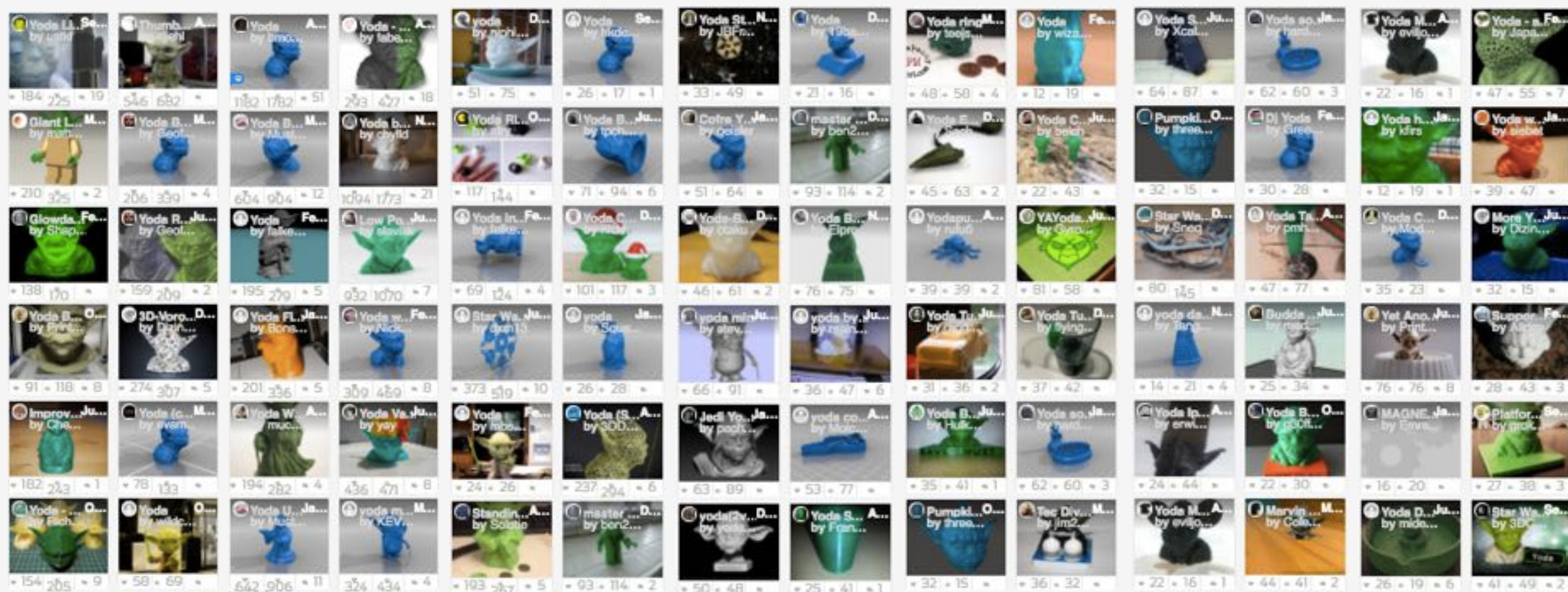
0 results matching black history month





## SEARCH RESULTS

269 results matching yoda





**Thingiverse**

# SEARCH RESULTS

0 results matching women's history month



0

**0 results for "hispanic": THINGS ▼**

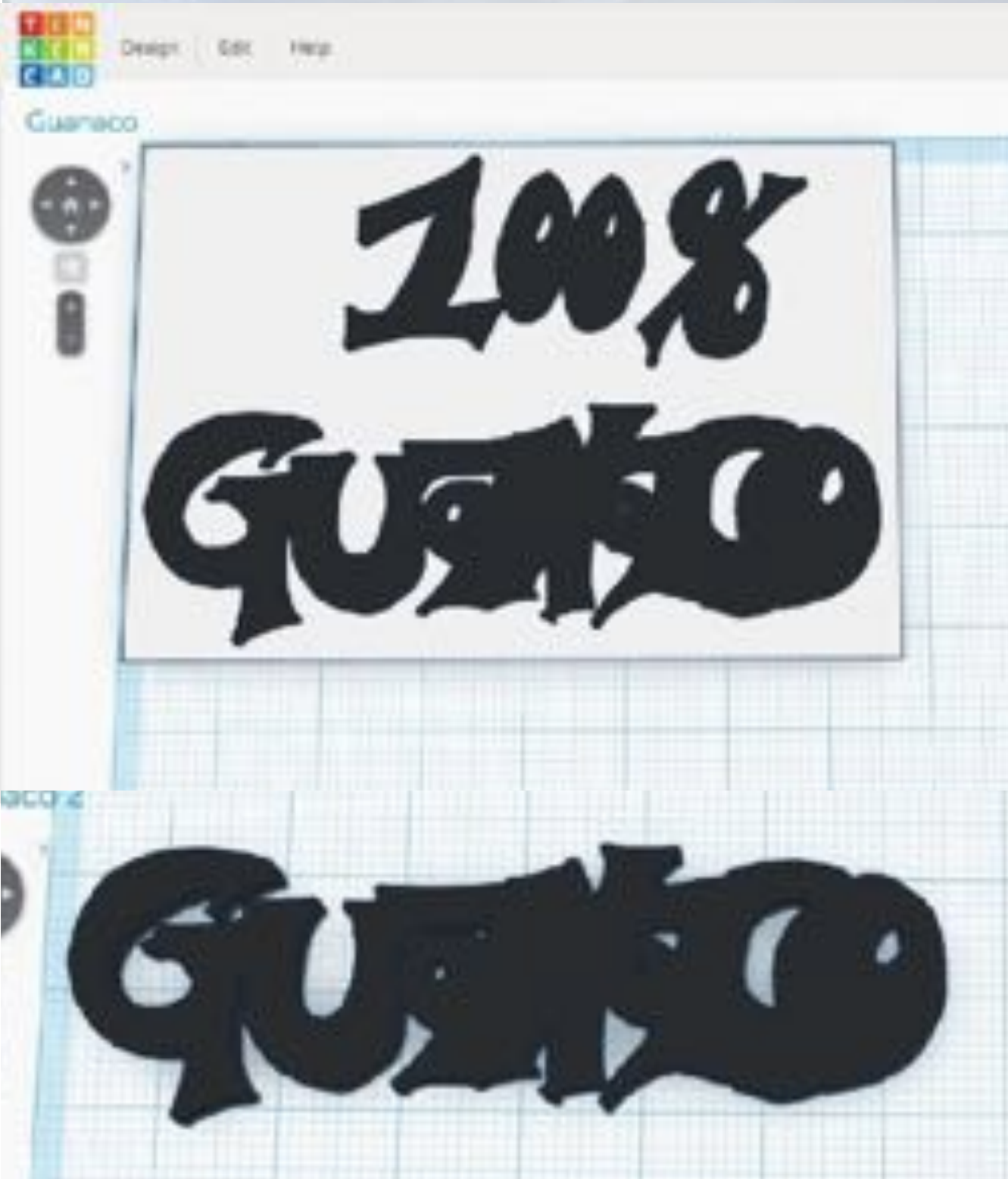
No things were found that matched your search.

**0 results for "latina": THINGS ▼**

No things were found that matched your search.



100%  
GUANACO



"Estoy orgullosa de ser salvadoreño." -Rivaldo









## Hispanic/Latino Heritage and Culture

by DesignMakeTeach, last updated Oct 3, 2016



### Description

A collection to celebrate Hispanic and Latino heritage and culture. National Hispanic Heritage Month is celebrated in the United States from September 15 – October 15. Please join the National Hispanic Heritage Month group and contribute to the discussion and suggestions for addition to this collection <http://www.thingiverse.com/groups/hispanic-heritage/>

The purpose of this project is to encourage students to contribute to the diversity of models on Thingiverse by designing and posting models featuring Hispanic and Latino culture. Read more about this project at <https://designmaketeach.com/national-hispanic-heritage-month/>





## Featured Collections

Download and print today

[see more >](#)



Pocket-Tactics ...



HTC Vive



iPhone 7



Hispanic/Latin...



Pegboard



Text



PocketCHIP



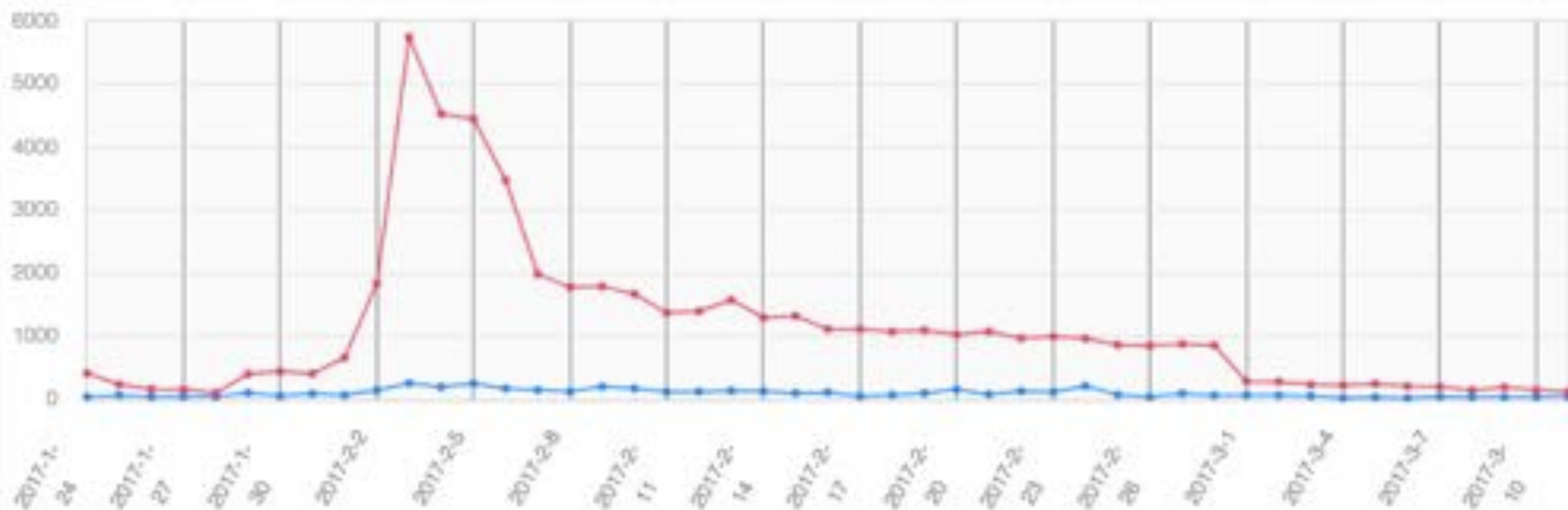
Accessibility





## Thingiverse Featured

[@DesignMakeTeach](#) placed portraits of NASA mathematicians Dorothy Vaughan, Mary Jackson, and Katherine Johnson in bas relief on the this Friendship 7 capsule. The story of their pivotal role in the first orbit of Earth by an American is told in the [book and movie](#) Hidden Figures. Print one, then see the movie!

[Learn More](#)







36 Which of these nets would form a cube when folded?

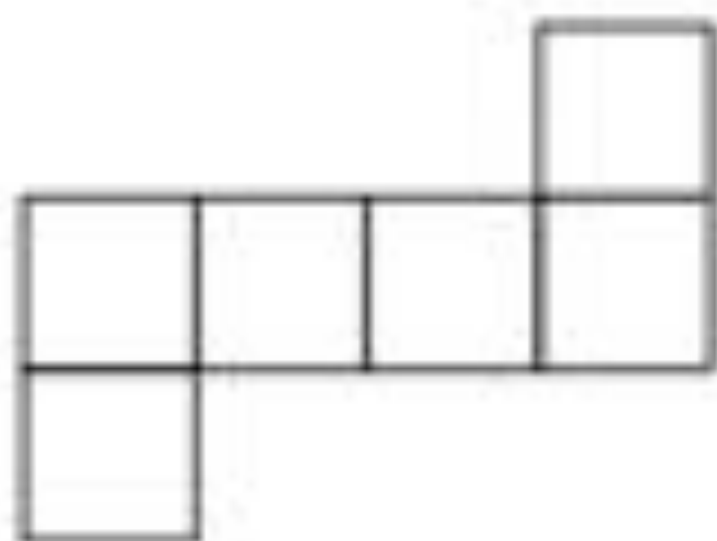
VIRGINIA STANDARDS OF LEARNING

Spring 2010 Released Test

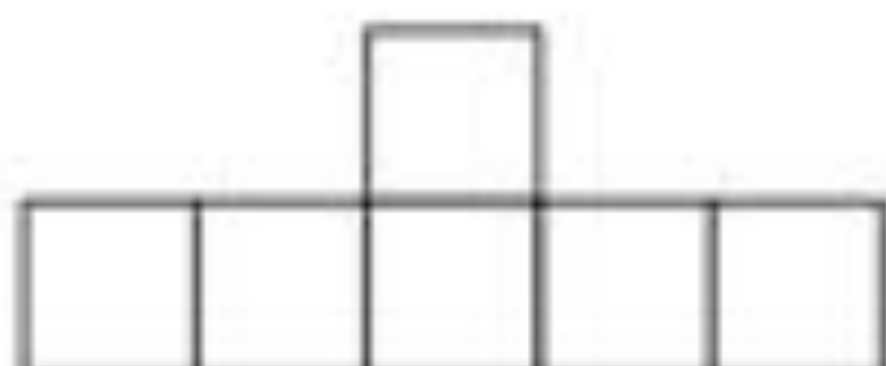
## END OF COURSE GEOMETRY

Form M0110, CORE 1

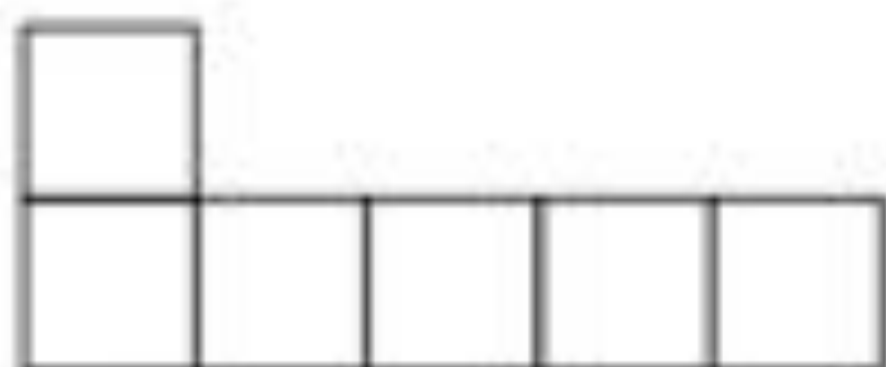
F



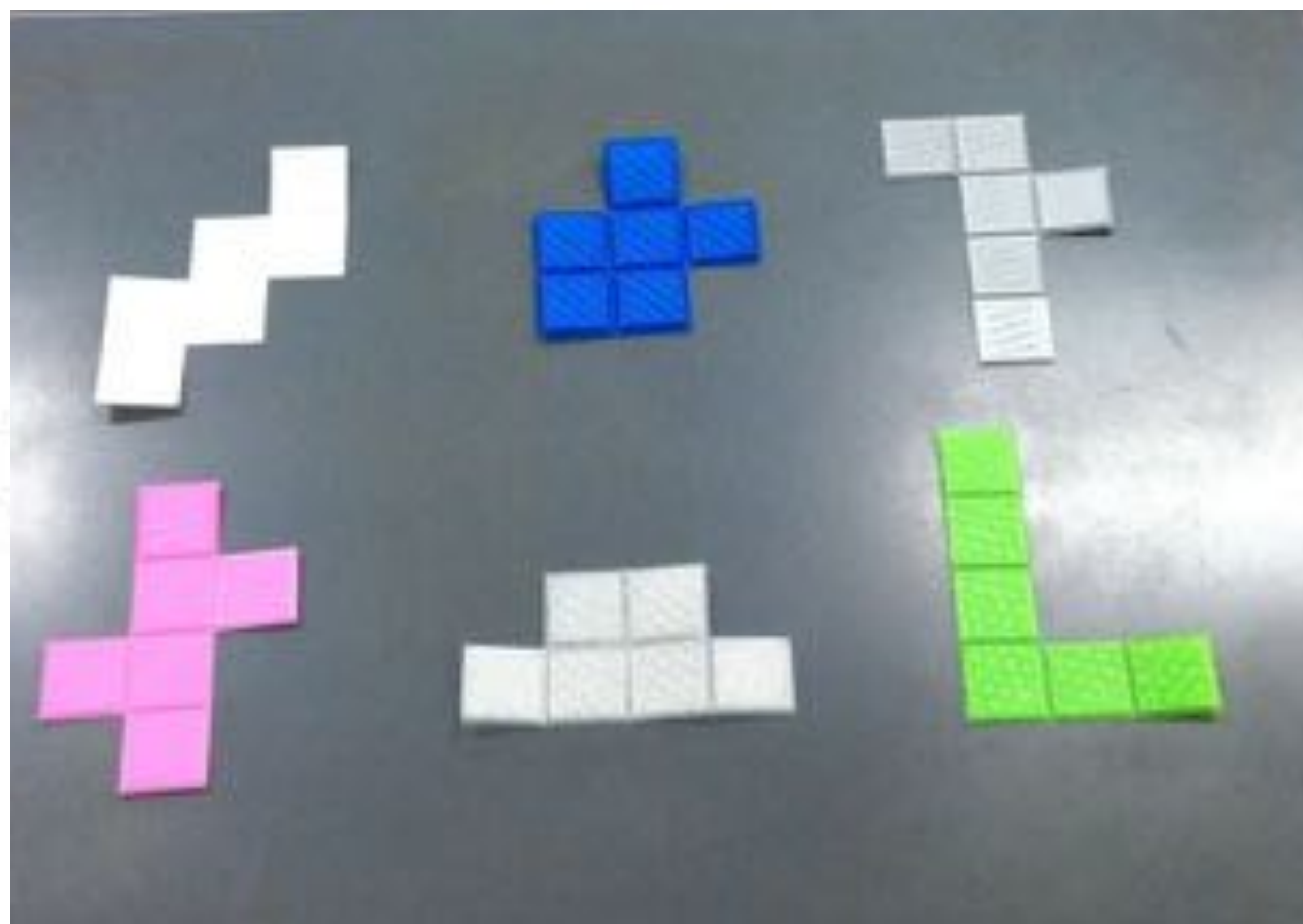
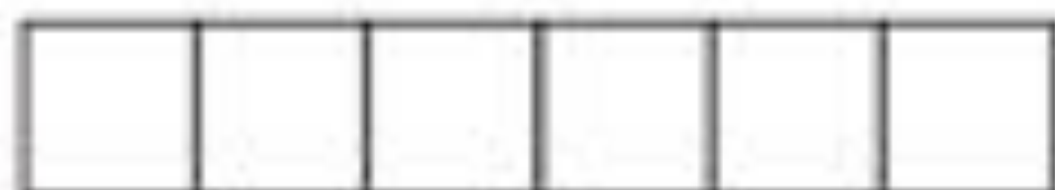
G



H



J





## Tags

Add Tags

African American

Airmen

Black History

Tuskegee

Tuskegee Airmen

WWII



## Summary

Challenge: Create and share a 3D design that celebrates the contribution of the Tuskegee Airmen and/or other African American Pioneers in Aviation and Space with the hashtag #TuskegeeAirmen. List this design as a source for your model.

A search for 3D printable models related to the Tuskegee Airmen or other African American pioneers in aviation or space returns 0 hits. This is no surprise given previous experience searching 3D repositories for models related to Martin Luther King, Jr.

<http://designmaketeach.com/2014/01/16/3d-printing-martin-luther-king-jr/>

The lack of models provides a rich opportunity for students, educators and 3d designers to make a significant contribution to the world.

My contribution is a 3D printable version of the patch of the 332nd Fighter Group. The design uses an image from Wikimedia [https://commons.wikimedia.org/wiki/File:Shield\\_of\\_the\\_332nd\\_Fighter\\_Group.svg](https://commons.wikimedia.org/wiki/File:Shield_of_the_332nd_Fighter_Group.svg) which was edited in Inkscape and then imported and remixed in Tinkercad.

Read the whole story about this design challenge at <http://designmaketeach.com/2016/01/27/tuskegee-airmen-3d-design-challenge/>

This thing was made with Tinkercad. Edit it online  
<https://www.tinkercad.com/things/3Tgmnet8pUf>



12. EMPLOYMENT (Show every employment you have had and all periods of unemployment)				
MONTH AND YEAR		NAME AND ADDRESS OF EMPLOYER	NAME OF IMMEDIATE SUPERVISOR	REASON FOR LEAVING
FROM—	TO—			
May 42	Jul 43	Tulelake Relocation Ctr, CA	US Government	Transferred
Aug 43	Apr 45	Heart Mountain Relocation Center, WY	US Government	Drafted

by WHITE & POLLARD

GROCERY

WANT

FRUITS  
AND  
VEGETABLES

I AM AN AMERICAN

WANTO CO

WANTO CO

VEGETABLES

WHITE & POLLARD







# I AM AN AMERICAN

by DesignMakeTeach, published 8:20 AM

[EDIT THING](#)

I AM AN AMERICAN

by designmake2014 1 month ago



+

-

**I AM AN AMERICAN**



Thing Details



Thing Files



Apps

0

Comments

0

Made

0

Collections

0

Remixes



DOWNLOAD ALL FILES



Like

0



Collect

0



Comment

0



I Made One

0



Watch

0



Remix It

0



Share

Thing Apps Enabled

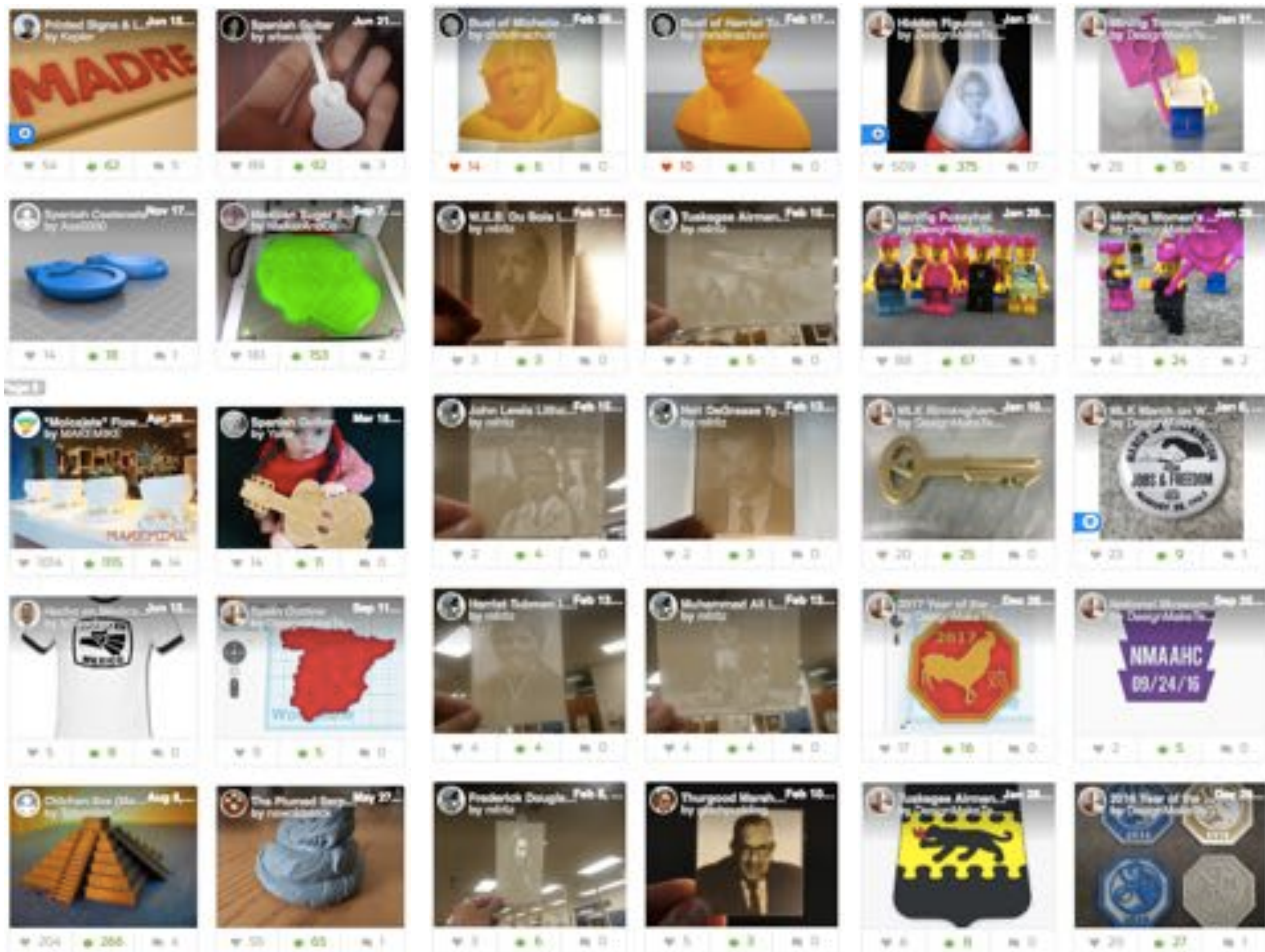


Order This Printed



View All Apps







# 0 Things

**DesignMakeTeach.com**

**@DesignMakeTeach**

**YouTube.com/DesignMakeTeach**



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**What is your 0 Things?**



# HIDDEN FIGURES - FRIENDSHIP 7 CAPSULE





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# Goal

## **3D Printing Projects that Matter**

# HANDOUTS & CONTACT INFO



[DesignMakeTeach.com/TCEA6](https://DesignMakeTeach.com/TCEA6)

**Josh Ajima**

**@DesignMakeTeach**

**DesignMakeTeach.com**

**youtube.com/designmaketeach**



# FEATURED PRESENTER



## **Digital Fabrication in the Classroom**

**Mon, February 5th, 8:00 AM – 11:00 AM, 9C**

## **Scaling Up the Makerspace**

**Mon, February 5th, 3:30 PM – 4:30 PM, Ballroom E**

## **The Maker Mindset**

**Tue, February 6th, 9:45 AM – 10:45 AM, Ballroom F**

## **Making with Head, Hands, and Heart**

**Tue, February 6th, 11:30 AM – 1:00 PM, 6B**

## **The Makerspace Chromebook**

**Wed, February 7th, 8:00 AM – 11:00 AM, 10A**

## **3D Printing Projects That Matter**

**Wed, February 7th, 3:30 PM – 5:00 PM, 9A**

# EDUCATOR



**Instructional Facilitator for Technology**  
**-Dominion High School & Loudoun Academy of Science, Sterling, VA (2003-present)**

**Director of Instructional Technology**  
**-Clarke County, VA(1998-2003)**

**Teacher: Chemistry, 7th Life Science, 8th Physical Science, Cisco Networking**  
**-Clarke County, VA (1996-1998)**



# MAKER



**Make Magazine Review Team  
2014 & 2015**

**Featured: Thingiverse,  
Pinshape, Adafruit**

**World Maker Faire NY: Best  
in Class Ribbon**

**Outsider Art Fair NY: Tower  
Design Competition - 2nd  
Place**



# MAKER EDUCATOR

CTE MAKEOVER  
CHALLENGE



**Construct<sub>3D</sub>**  
3D PRINTING & DIGITAL FABRICATION FOR EDUCATION



## Top Educational Model

The Top Educational Model Award goes to **DesignMakeTeach** for his design, Hidden Figures. This model integrates a number of educational concepts, including 3D modeling and the physics involved with light opacity. Congratulations and we hope the Wacom Cintiq and Adafruit and 3D Hubs gift cards help you continue your inspirational work!

**US Department of Education's CTE  
Makeover Challenge Winner**

**Stanford FabLearn Fellow**

**Formlabs 3D Design Awards -Top  
Educational Model**

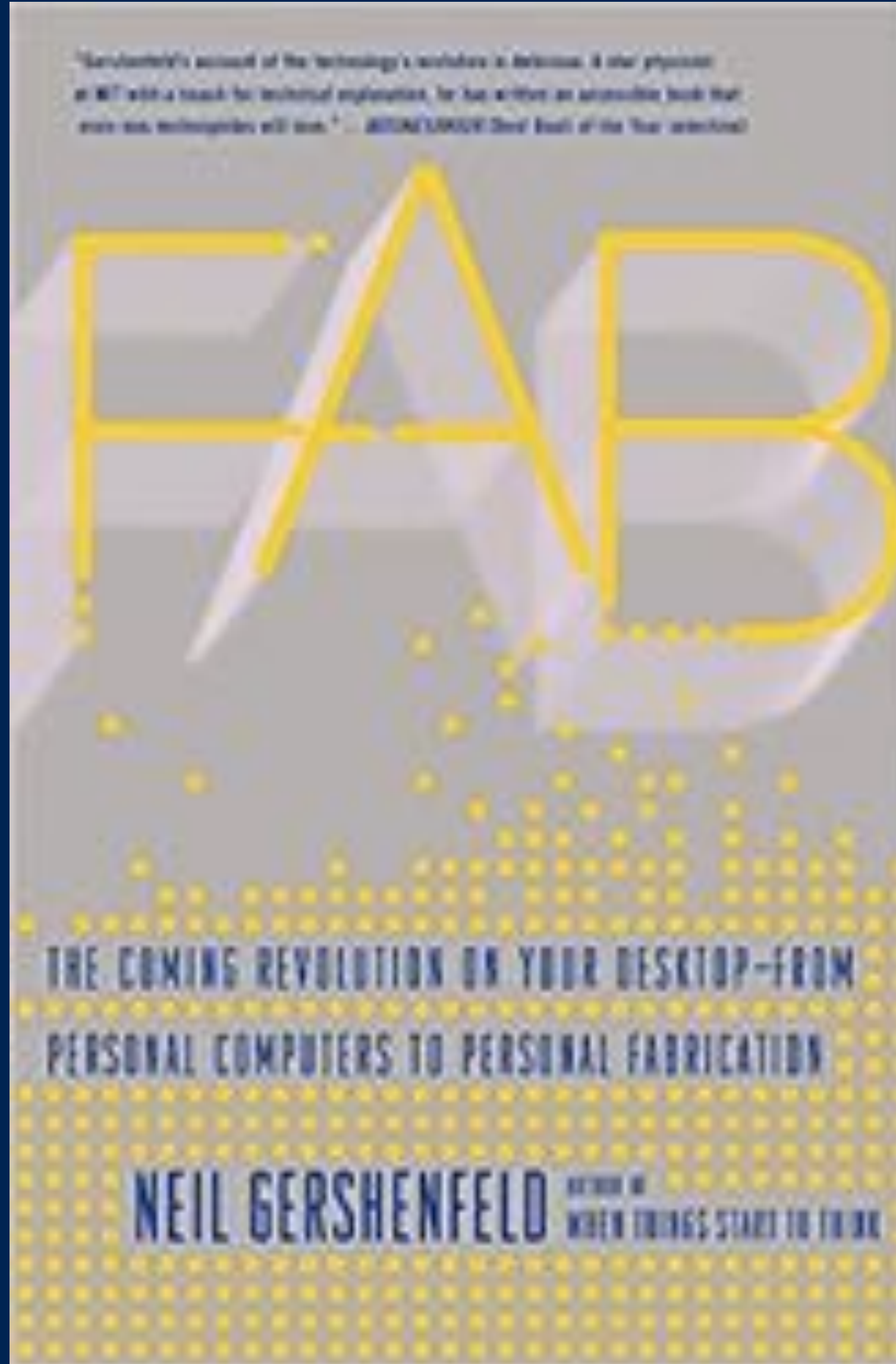
**Construct3D 2017 - K12 Program Chair**

**VSTE Innovative Educator of the Year**

**Josh Ajima - [DesignMakeTeach.com](http://DesignMakeTeach.com)**



# MY MAKER JOURNEY



## Neil Gershenfeld: MIT Center for Bits and Atoms

**-2005 NSBA Conference**

**-How to Make (almost) Anything**

**-Personal Fabrication**

**-FabLabs**

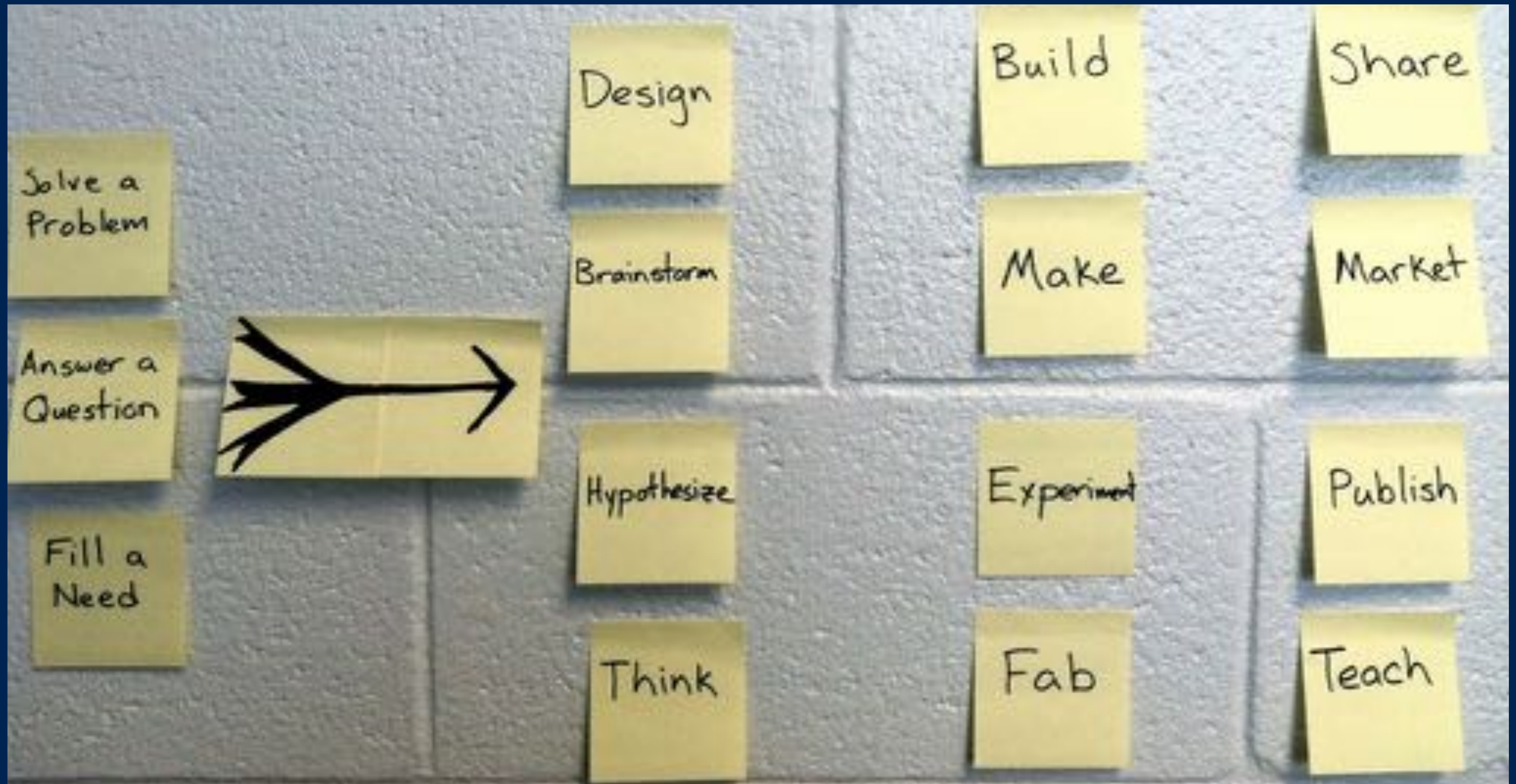
# UNIVERSAL DESIGN FOR LEARNING

- Multiple Means of Engagement
- Multiple Means of Representation
- Multiple Means of Action & Expression



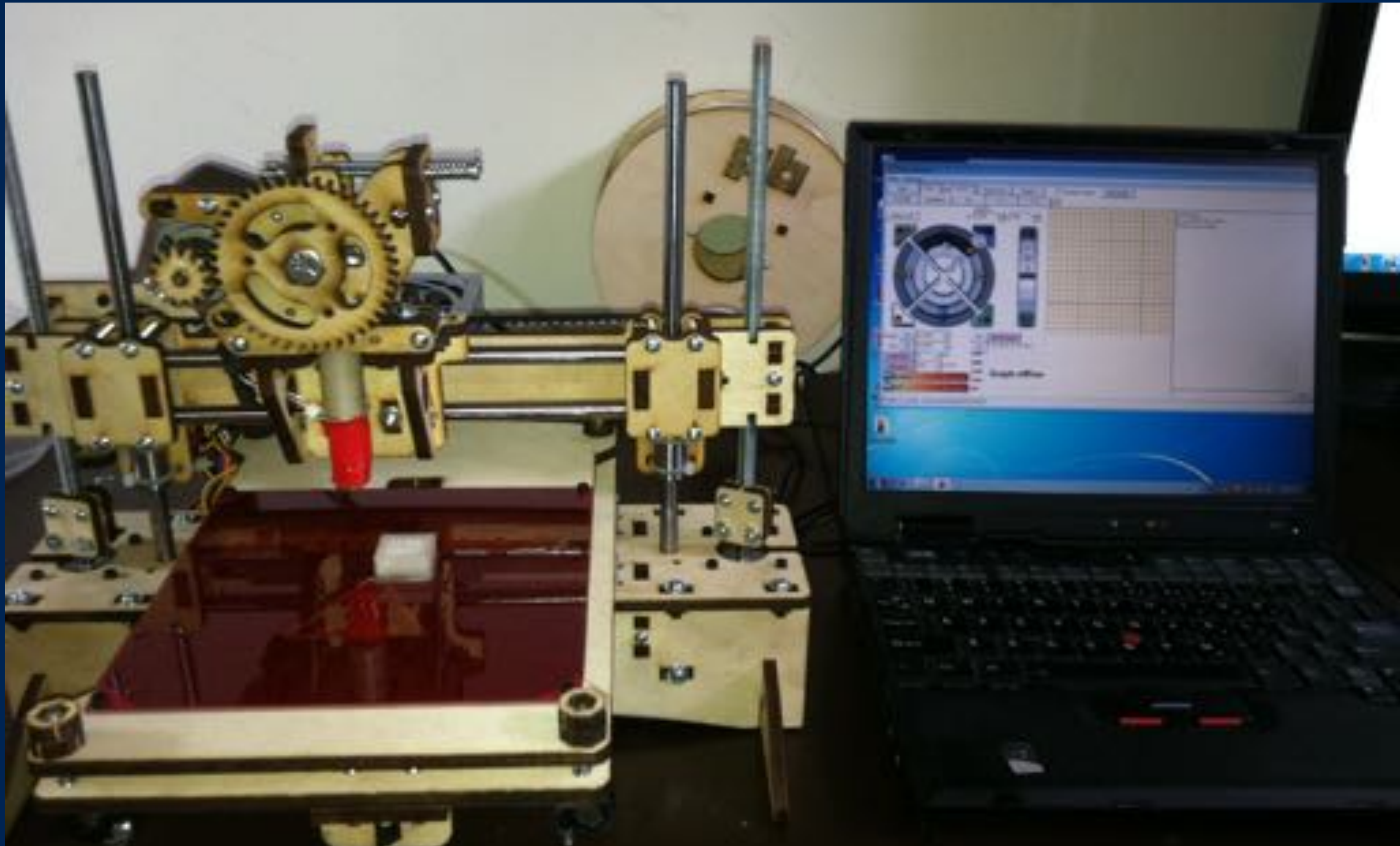


# A MAKER EDUCATION MODEL





# PERSONAL INVESTMENT



Josh Ajima - [DesignMakeTeach.com](http://DesignMakeTeach.com)



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Matters to  
**STUDENT**  
**CLASSROOM**  
**WORLD**





# ENABLING THE FUTURE

A Global Network Of Passionate Volunteers Using 3D Printing To Give The World A "Helping Hand."

- HOME
- FEATURED STORIES
- BLOG
- ABOUT
- GET INVOLVED
- RESOURCES
- DEVICES
- DONATIONS
- SHOP

SEE BELOW FOR OUR CURRENTLY AND MOST USED DESIGNS AND LINKS TO THEIR FILES:



**PHOENIX HAND** - Widely used, improvement of the Raptor Reloaded design and has assembly instructions available.

**WRIST DRIVEN:** User must have a functional wrist and enough palm to push against the device to force the fingers closed when wrist is bent.

This design was created by Jason Bryant, e-NABLE volunteer, researcher and teacher at Shandong University in China. His design is an amalgamation of the Raptor Reloaded hand and the Falcon V1 hand designed by Dr Adam Arablan from Seattle Pacific University. The Falcon V1 was the first e-NABLE 3D printed hand prototype to use orthodontic rubber bands as opposed to the elastic cords that current devices use.

**Phoenix Assembly Materials Kit Now Available**

[An Arm for All - e-NABLING Togo](#)

[We Are Enabling The Future](#)

[e-NABLING Students To Become Teachers](#)

[Donate Unassembled Hands And Assembly Kits!](#)

[3D Printing Is For The "BIRDS"](#)

[e-NABLE COMMUNITY CHAPTER SPOTLIGHT - Fundación Prótesis 3D CHILE](#)

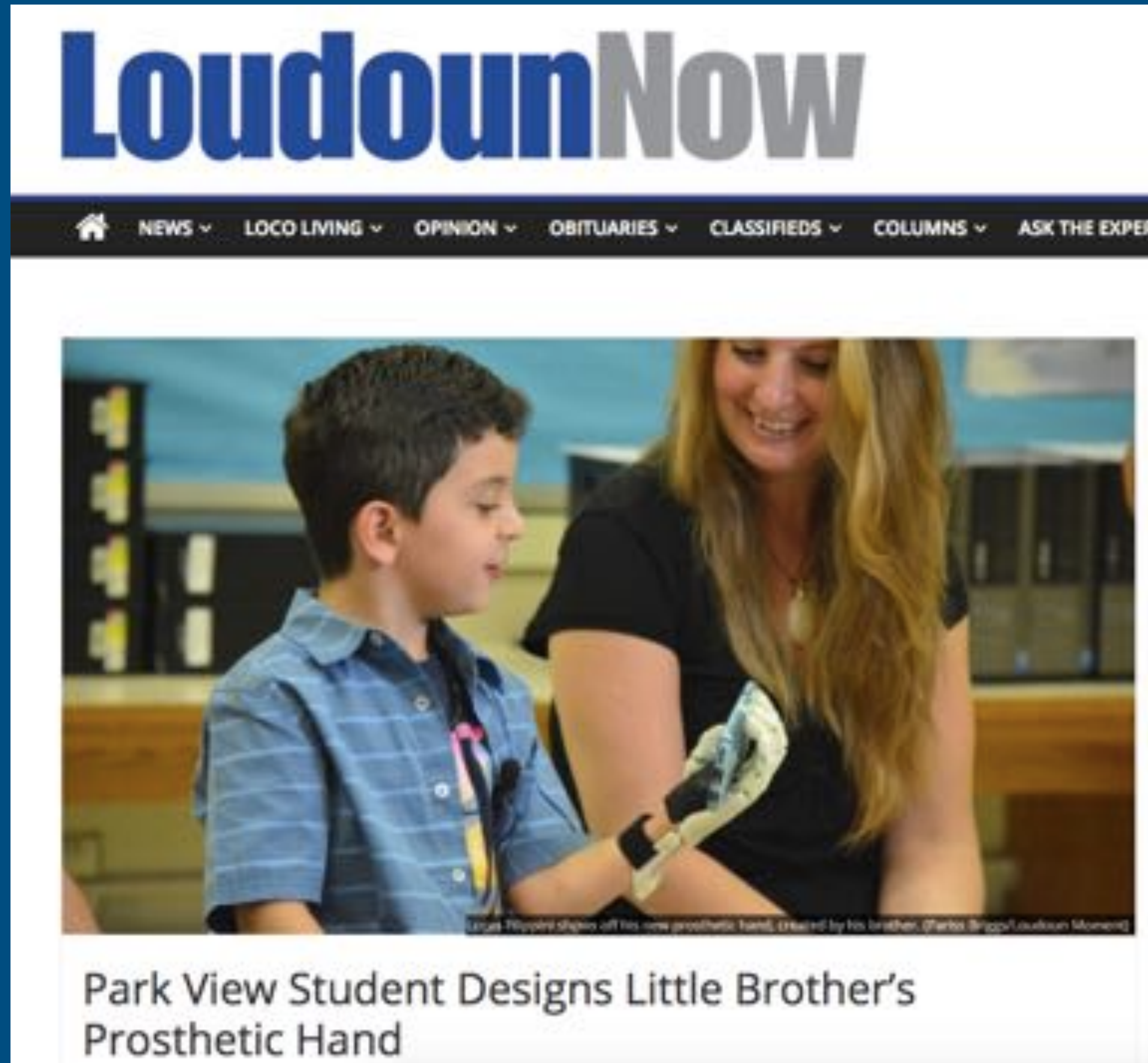
[Cam's 3D Printed Hand Journey](#)

### SEARCH THIS SITE

SEARCH



<http://loudounnow.com/2016/06/29/park-view-student-designs-little-brothers-prosthetic-hand/>






Josh Ajima - DesignMakeTeach.com



# BROOKWOOD'S 3D DESIGN PROBLEM BANK PROJECT

HOME PAGE DESIGN A SOLUTION DESIGN PROBLEMS CREATE A PROBLEM BANK EXAMPLES OF SOLUTIONS MORE...



BROOKWOOD SCHOOL

## Using Real-Life Problems To Teach Students to Design Authentic Solutions

Post  
A  
Problem

Design  
A  
Solution

See  
Students'  
Solutions

Create A  
Problem  
Bank

Seniors  
Design  
Project

In this project, students from Brookwood School in Manchester, MA are 3D designing and printing solutions to problems posted by members of the Brookwood community. Putting student designers in touch with people in need of a 3D designed and printed solution leads to "win-win" opportunities for all involved.





**3D PRINTED STARWARS**  
**LIGHTSABER**







## YOUR READING LIST



3D-Printed Sculptures At The Outsider Art Fair



The 10 Most Dangerous U.S. Cities



The Toughest Jobs To Fill In 2017

## 3D-Printed Sculptures At The Outsider Art Fair

1 of 23



**Cottage, John Ajima. Printed By Voodoo Manufacturing.**

At the Outsider Art Fair, Babel brought together contributions in a 3D-printed series of miniature towers. Curator Leah Gordon

Photo: Leah Gordon.

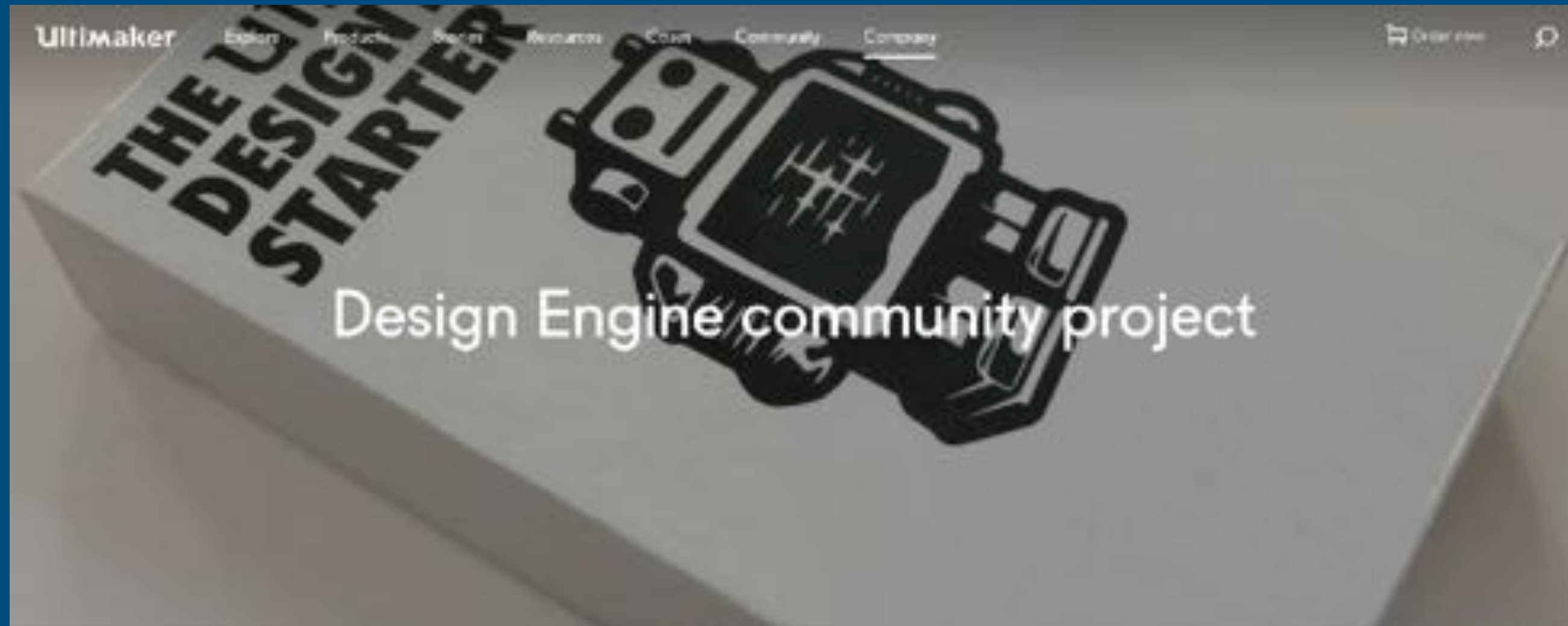








<https://ultimaker.com/en/blog/52448-design-engine-community-project>



### YOUR STYLE OF PLAY

Our aim with the **Starter Pack** is to offer a flexible enough set of rules to suit a range of styles, of play, numbers of players, and levels of experience. We expect players to discover new and powerful approaches to style of play over time, and share them!

**Before start of play, you will:**

- Decide to play as individuals, teams(2), or solo.
- Commit to details of "house rules" if needed.
- Plan to deliver sketches or digital designs later.

**A FEW POPULAR "FLAVORS"**

Just a few of the variants we have explored so far:

1. **PLAYER'S CHOICE** – Player selects which side of each Parameter Card is in play.
2. **KEEP ONE, PASS ONE** – Every player receives two Parameter cards. Player keeps one, passes the other.
3. **KEEP ONE, DISCARD ONE** – All players get two Parameter cards. Player keeps one, discards other.
4. **TICKING TIMEBOMB** – Modifiers remain face down on the table until a timer alarm rings. (5/10min)

### PLAY AS INDIVIDUALS

(2 to 20 Players, 10 to 15 minutes)  
Classic designer vs. designer throw-down!

#### GAMEPLAY

1. Set a timeframe (10-15 minutes).
2. Complete the challenge by taking into account your parameters, modifier and gameplay cards to create a 3D model, if time allows, print it.
3. After your timeframe expires, present your solution to other players and your justification for how you accommodated the parameters and modifiers.
4. Use the Scoring Matrix to identify the winner!

### PLAY AS INDIVIDUALS

(2 to 20 Players, 10 to 15 minutes)  
Classic designer vs. designer throw-down!

Each player picks a Challenge Card, full set for Parameters, Modifiers.

1. Shuffle cards into decks by color and place each face down on the table. Mix the Expansion Pack in with the Parameter Cards, the Modifier Cards and Gameplay Cards together.

2. When everyone has a Challenge Card, reveal the cards. Pick one like Parameter Cards. Place flip and over face up in front. The team that is right side up is the chosen parameter.

3. Pick one card from the top of the Modifier and Gameplay decks.

4. Place one Parameter and Modifier Card horizontally and face up under your vertical Challenge Card. Make sure you can see the title of the parameters and modifiers.





corinnetakara

...

corinnetakara One contributing factor to Colony Collapse Disorder are varroa mites which deform wing growth. This piece with two deformed bee represents the %40 decline in bees in CA over the past few years. #3Dprint assembly design.







corinnetakara

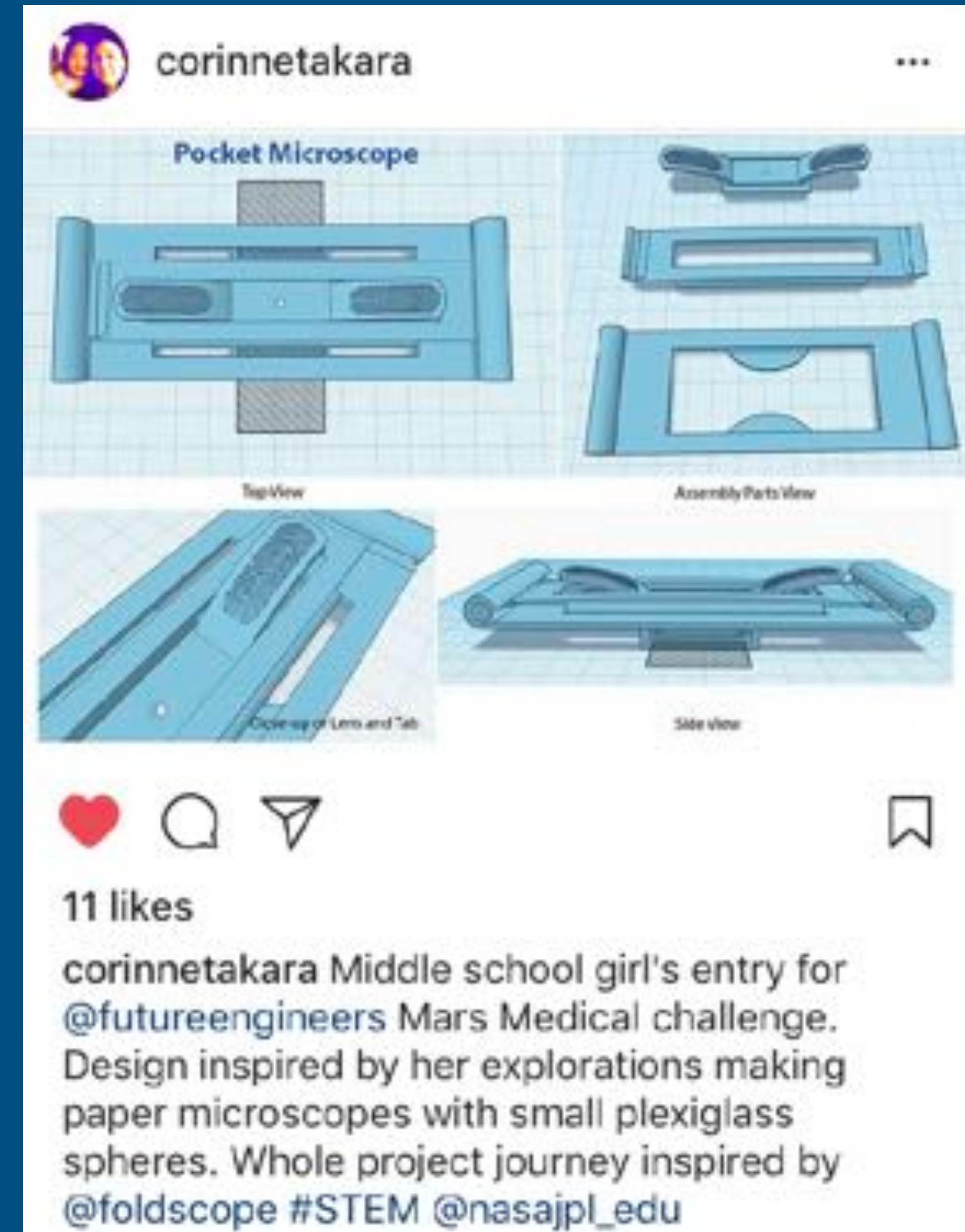
...



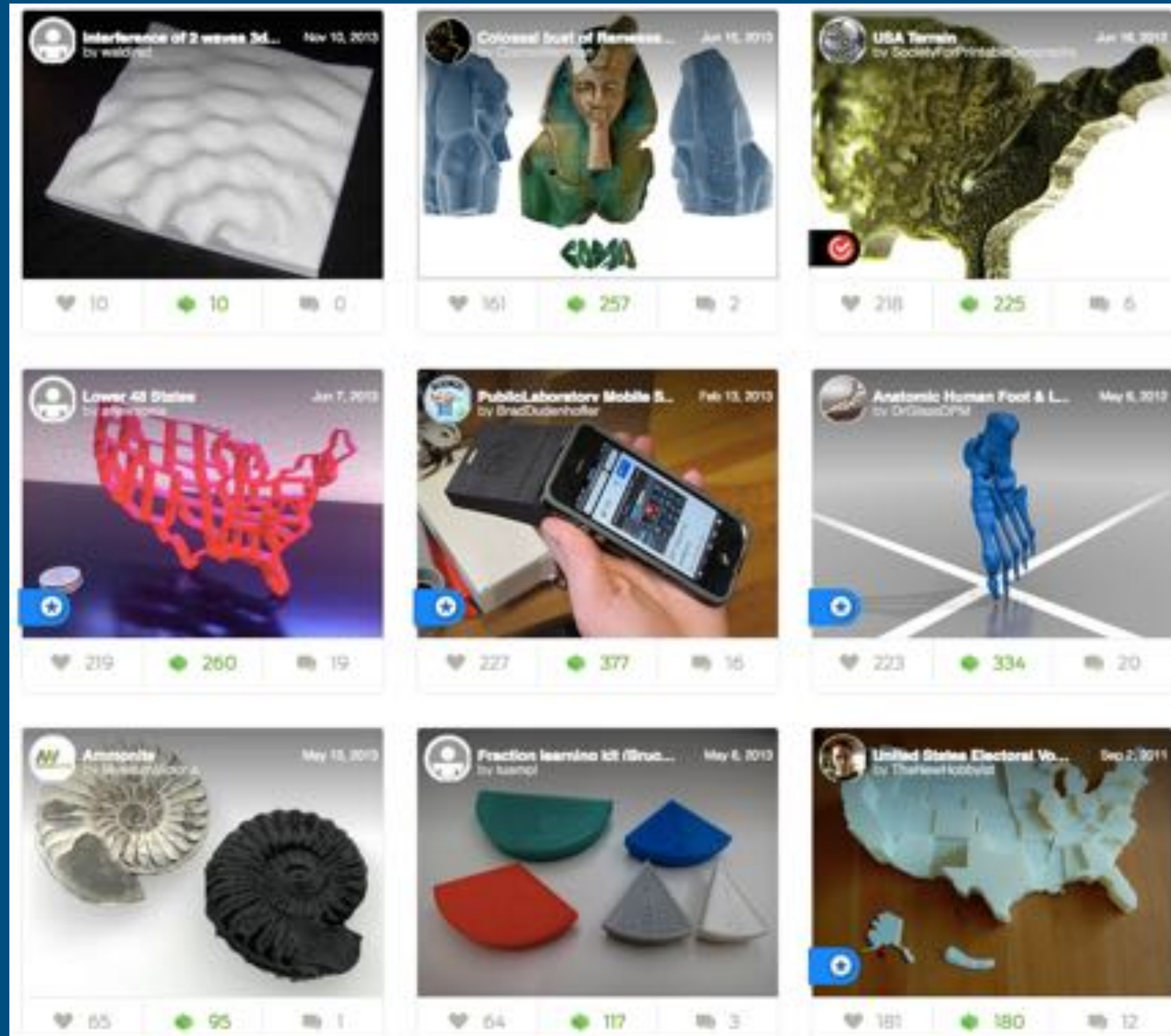
corinnetakara Cole was honored today to learn that he was a National Silver medalist in the Future New category of the @artandwriting awards. He was the only representative for this category for California. The work he submitted reflected on the Syrian refugee crisis through the form of an ancient Syrian flask. His use of #3Dprinting reflects the hope that 3D printing and 3D scanning will aid in preserving the memory of Syrian artifacts even as ISIS attempts to erase the history and culture of the region.

In his piece, refugee families endlessly circle the flask. In the three smaller circles are symbols of the refugee paths: tents, rail road lines, and rubber boats.

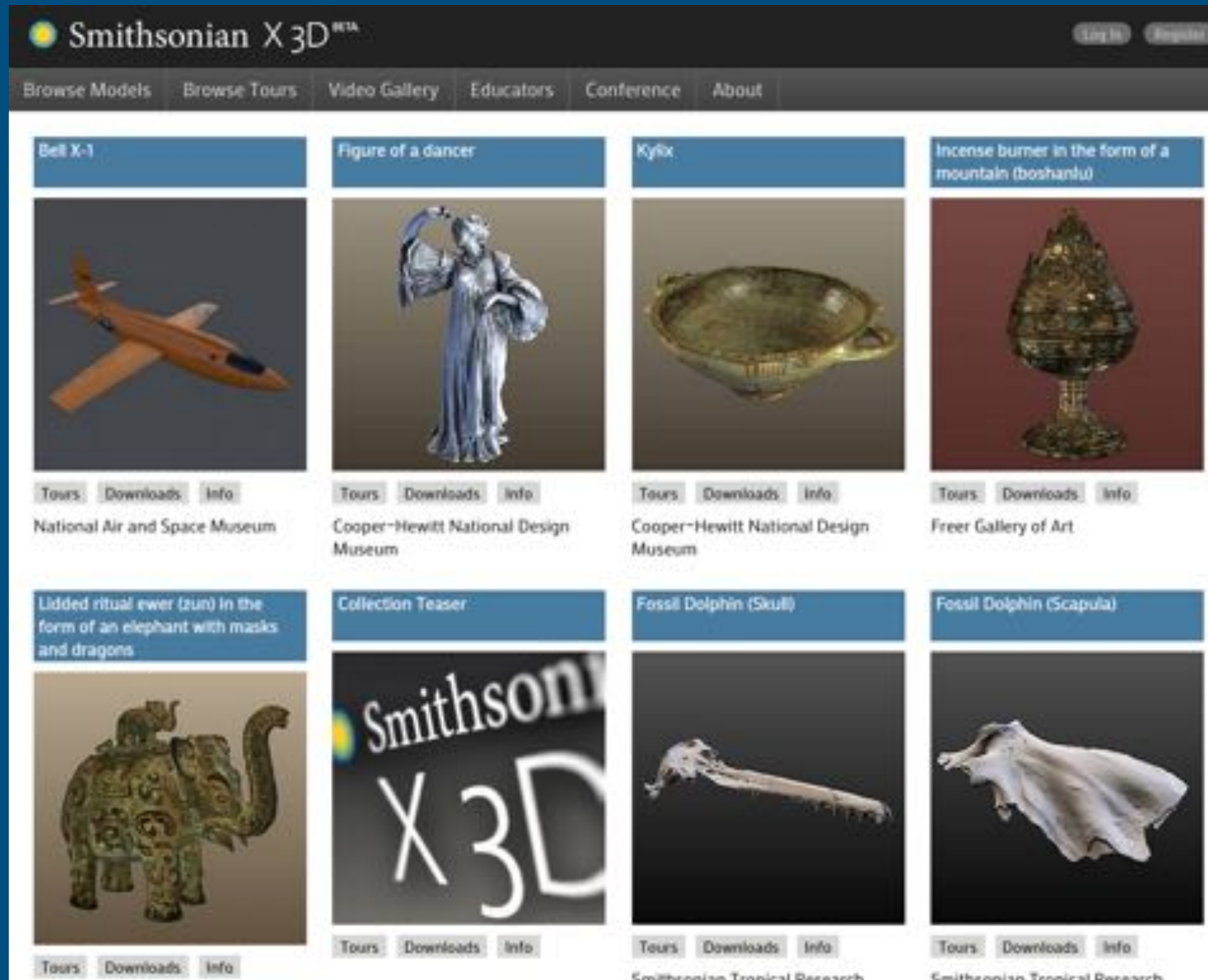














# NIH 3D PRINT EXCHANGE

[3dprint.nih.gov/](http://3dprint.nih.gov/)

U.S. Department of Health and Human Services — National Institutes of Health

NIH NIH 3D Print Exchange


DISCOVER SHARE CREATE LEARN ENGAGE NEWS & EVENTS ABOUT SEARCH

# NIH 3D PRINT EXCHANGE

DISCOVER SHARE CREATE LEARN ENGAGE

3D printing technology is advancing at a rapid pace, but it is difficult to find or create 3D-printable models that are scientifically accurate or medically applicable. The NIH 3D Print Exchange provides models in formats that are readily compatible with 3D printers, and offers a unique set of tools create and share 3D-printable models related to biomedical science.

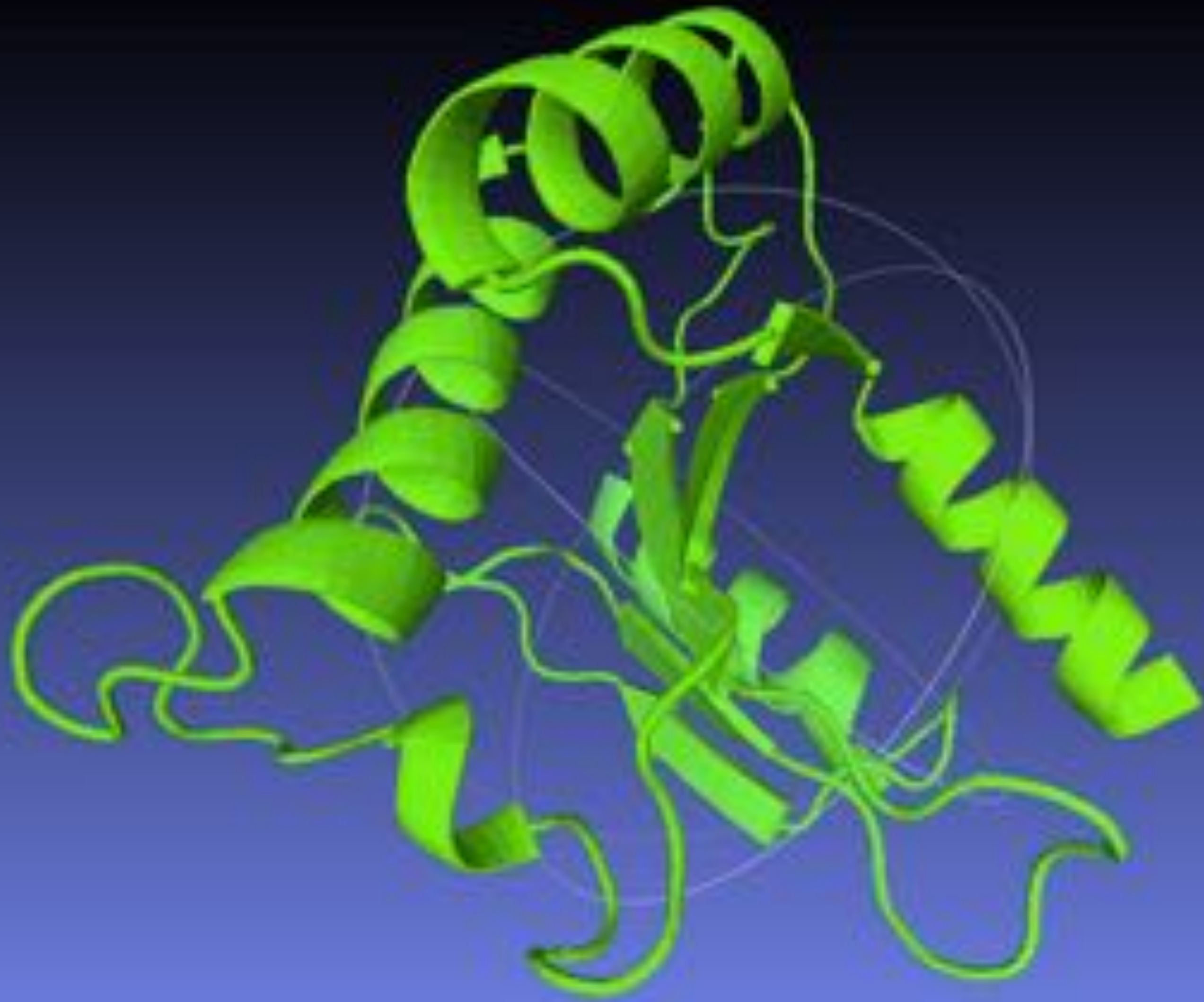
The NIH 3D Print Exchange





# PROTEIN MODEL

Student Designed Model

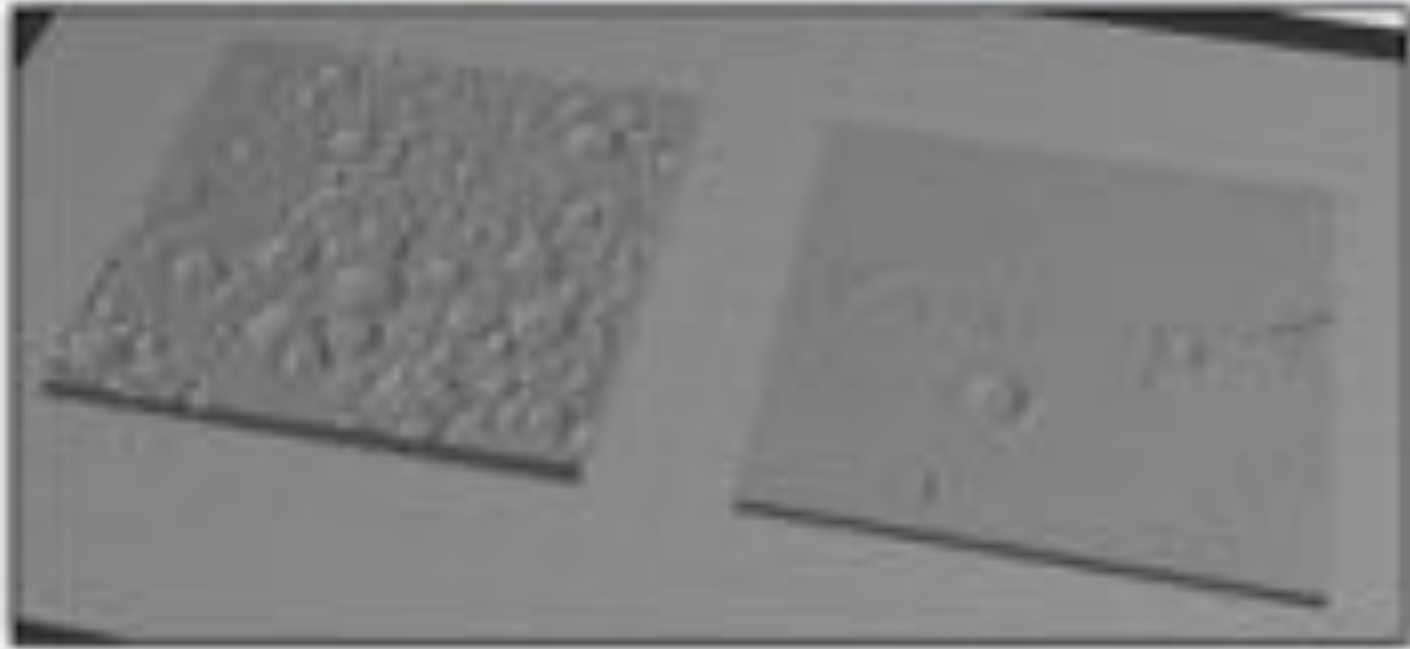




**NASA 3D Resources (Beta)**

[Home](#)  
[3D Models](#)  
[3D Printing](#)  
[Images and Textures](#)  
[Visualizations](#)  
[Contributors](#)  
[3D in the News](#)

## Moon Nearside Farside



This two STL files demonstrate the differences between the near and far side of Earth's Moon. The near side is smoother due to large lava flows that filled in many craters billions of years ago. Printed at their default size (8cm across) these models cover an area approximately 400km on a side at a scale of 5 million to one ( 1 cm = 50 km ) Data Credit : NASA/Goddard

[Download .stl file - 12.36 MB](#)

### Description

**Author/Origin:** Doug Ellison / NASA-JPL  
**Relevant Mission:** [LRO](#)  
**Date Added:** June 26, 2014

### Related Links

[National Institutes of Health 3D Print](#)

[Article: "Printing Space: Using 3D Printing"](#)

[3D Printing in space](#)

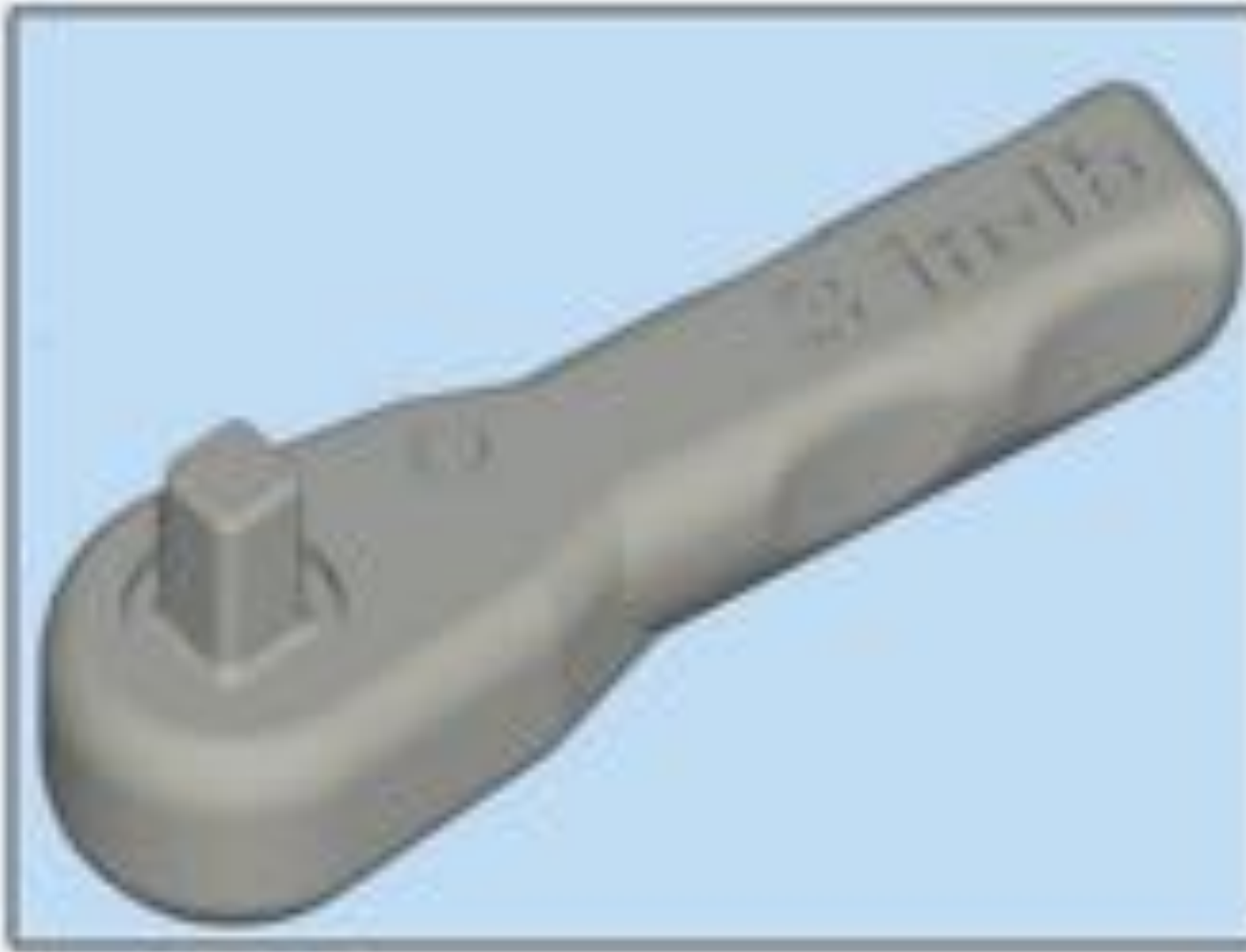
[Lunar Mapping and Modeling Portal](#)



# SPACE WRENCH

[nasa3d.arc.nasa.gov/detail/wrench-mis](http://nasa3d.arc.nasa.gov/detail/wrench-mis)

## Wrench



### Description

**Author/Origin:** Made In Space, Inc.(MIS)/NASA

**Relevant Mission:** Wrench

**Date Added:** January 14, 2015

**Keywords:** 3D Model, Wrench

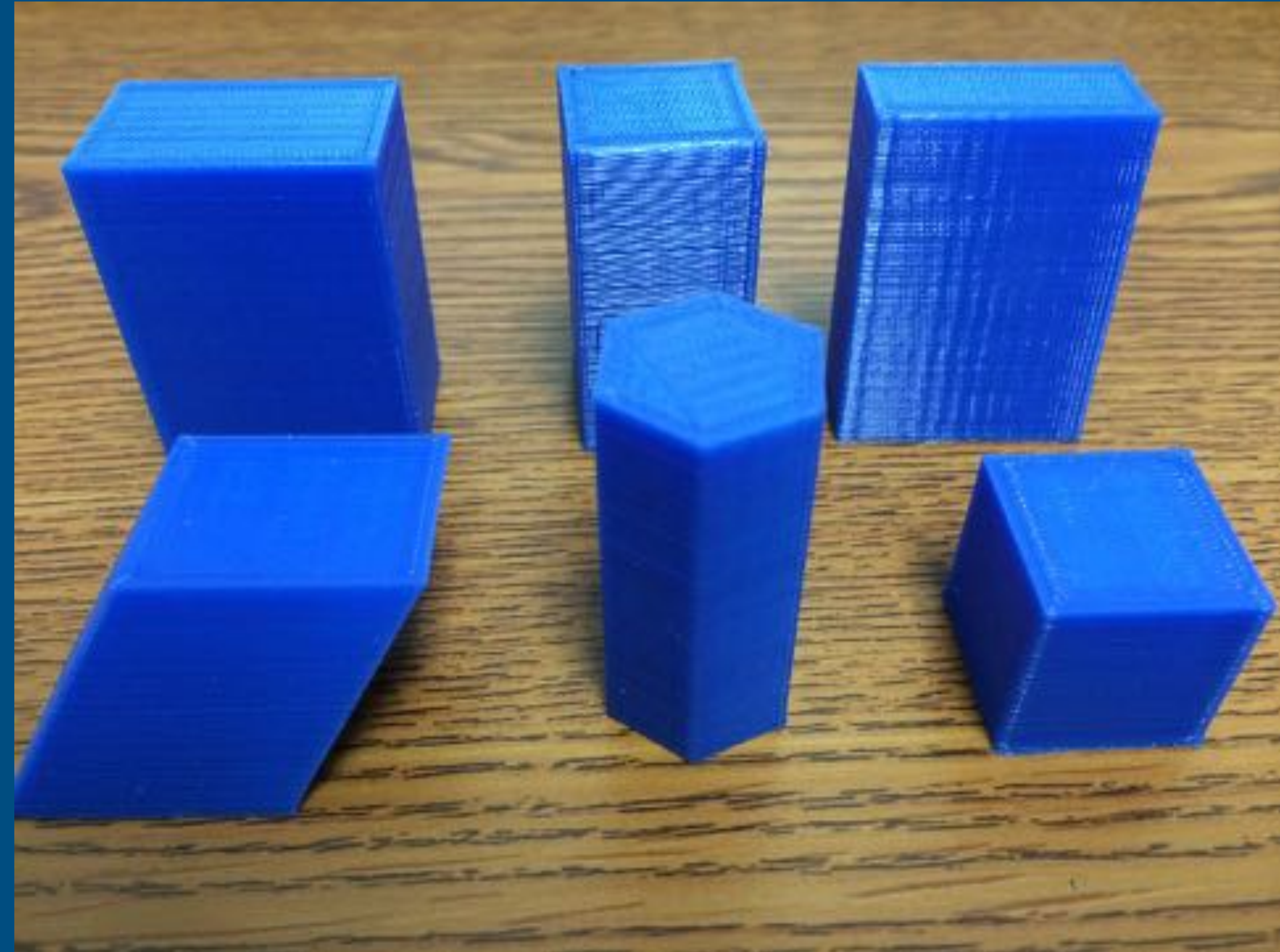
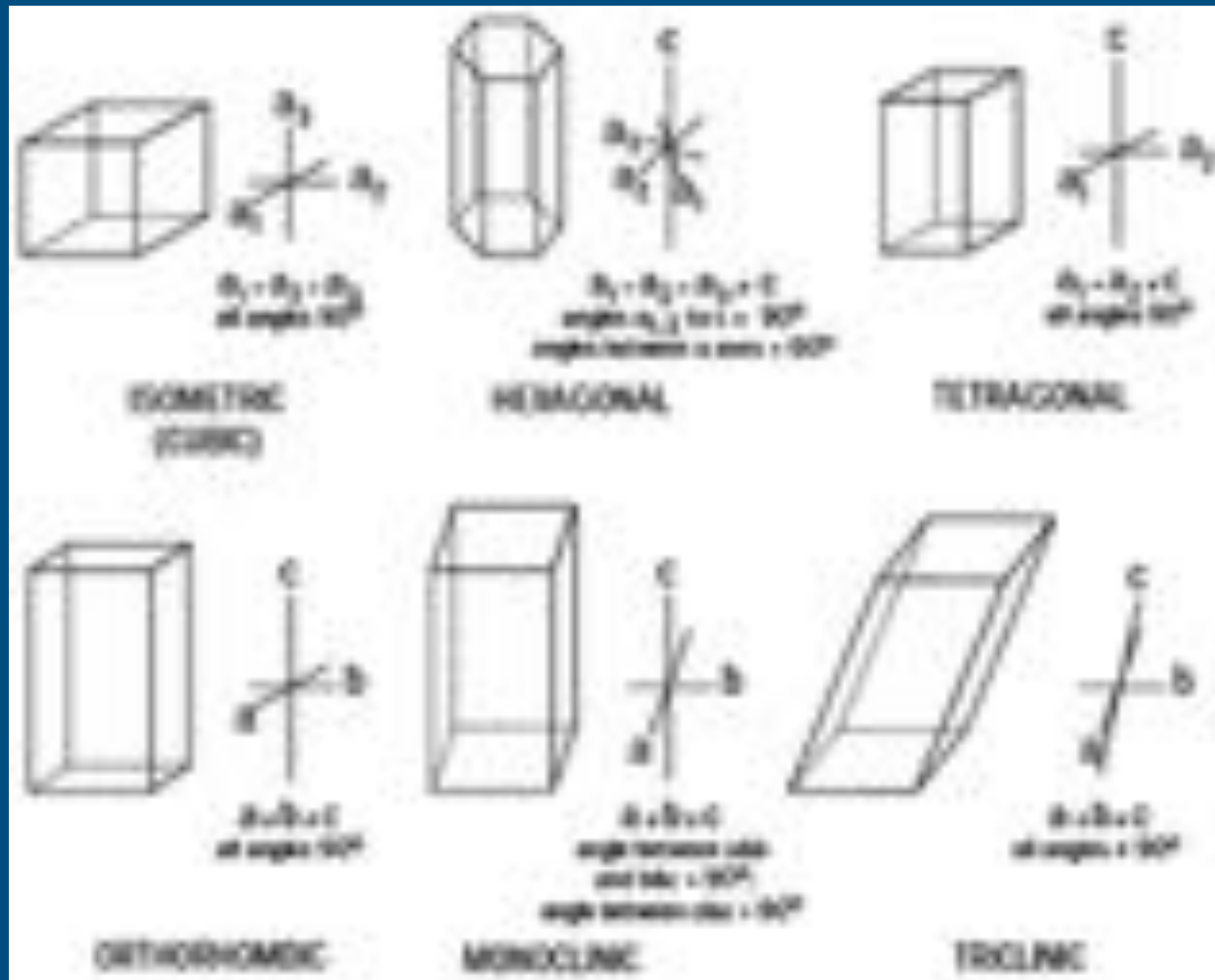
This isn't the first 3D-printed object made in space, but it is the first created to meet the needs of an astronaut. When International Space Station Commander Barry Wilmore needed a wrench, NASA knew just what to do. They "e-mailed" him one. This is the first time an object has been designed on Earth and then transmitted to space for manufacture.





# THE SIX CRYSTAL FAMILIES

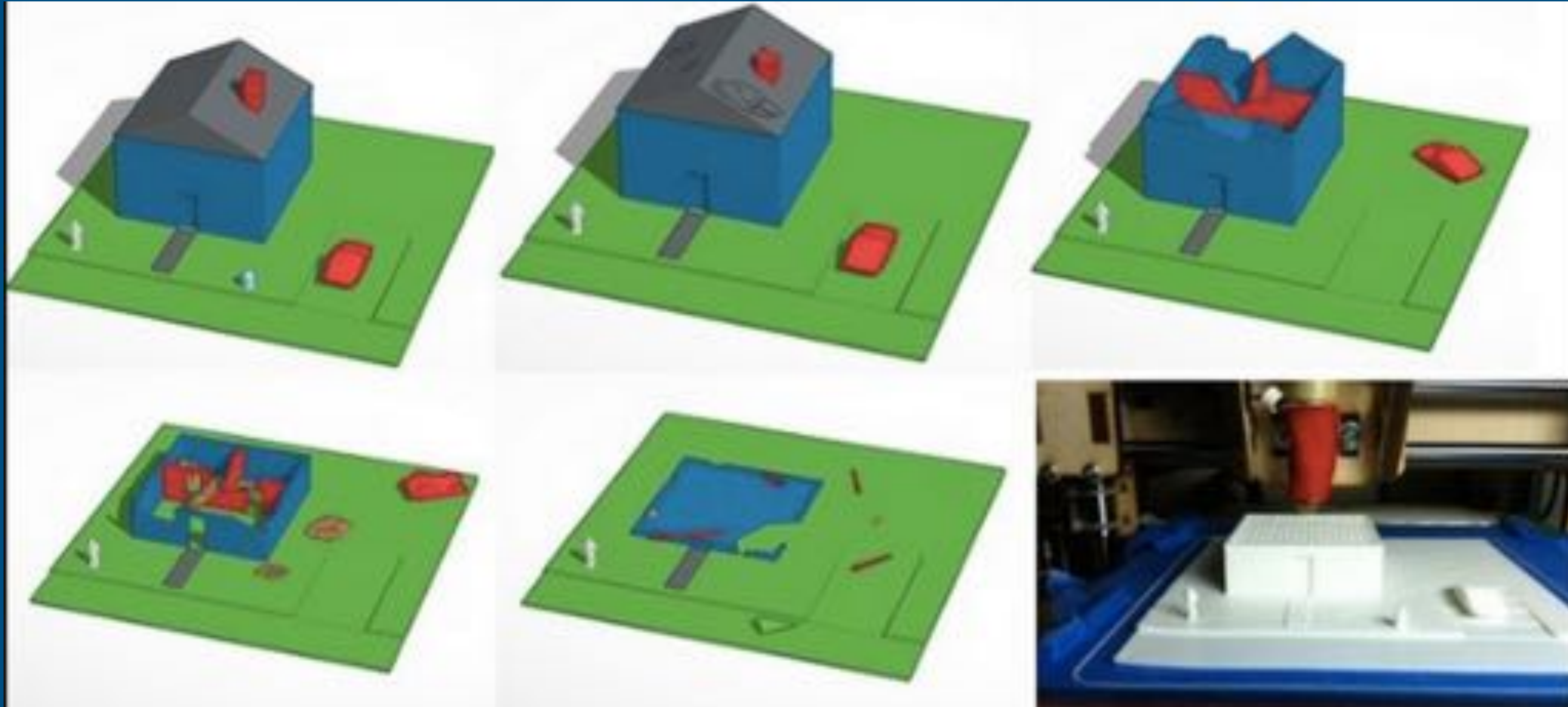
[thingiverse.com/thing:169569](https://thingiverse.com/thing:169569)





# FUJITA SCALE MODELING

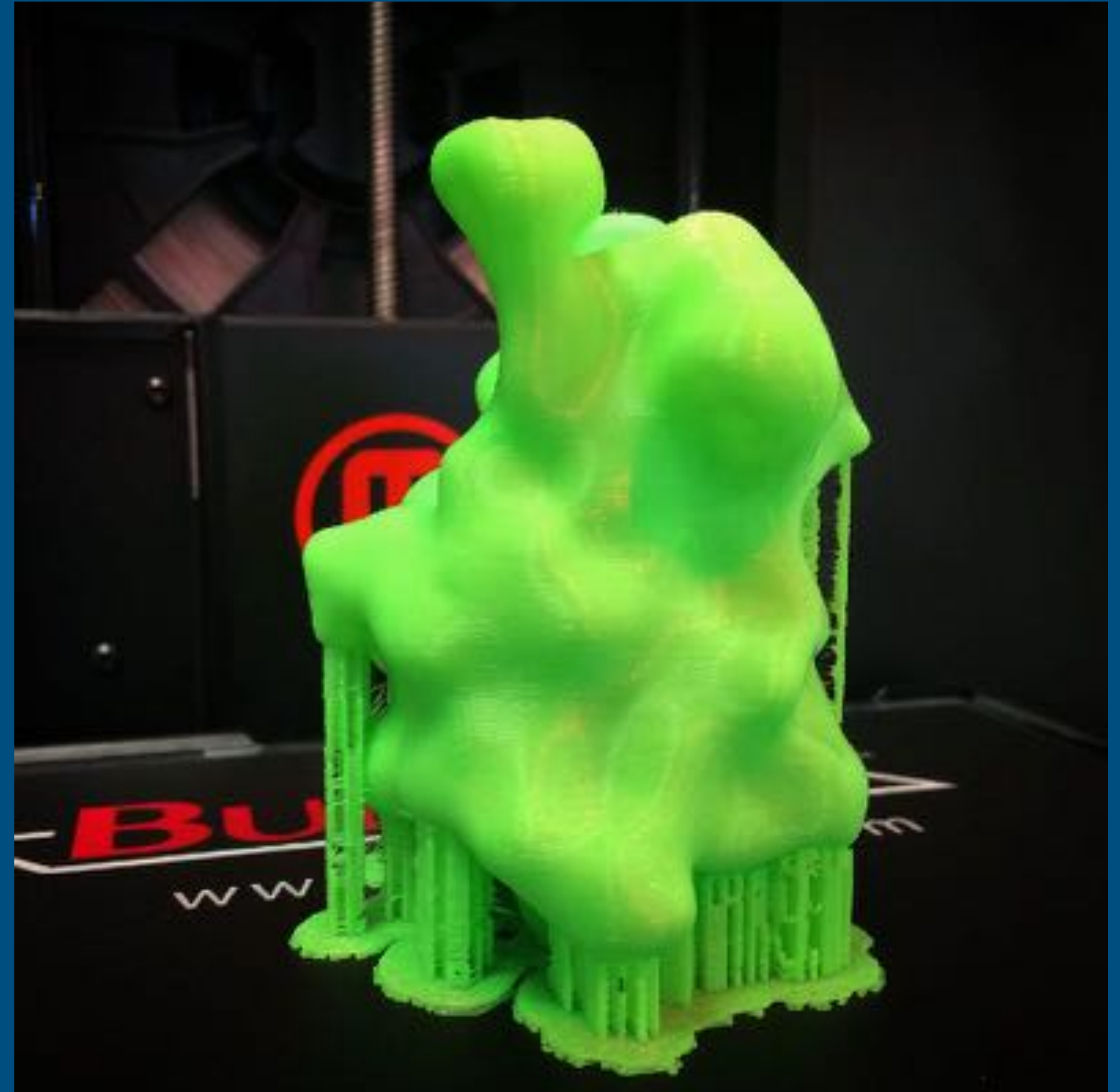
thingiverse.com/thing:298534





# HHMI'S BIOINTERACTIVE.ORG 2013 HOLIDAY LECTURES ON SCIENCE MODELS

[thingiverse.com/thing:222545](http://thingiverse.com/thing:222545)



@DesignMakeTeach - [DesignMakeTeach.com](http://DesignMakeTeach.com)



# HISTORICAL MARKER TEMPLATE

<http://www.thingiverse.com/thing:81412>







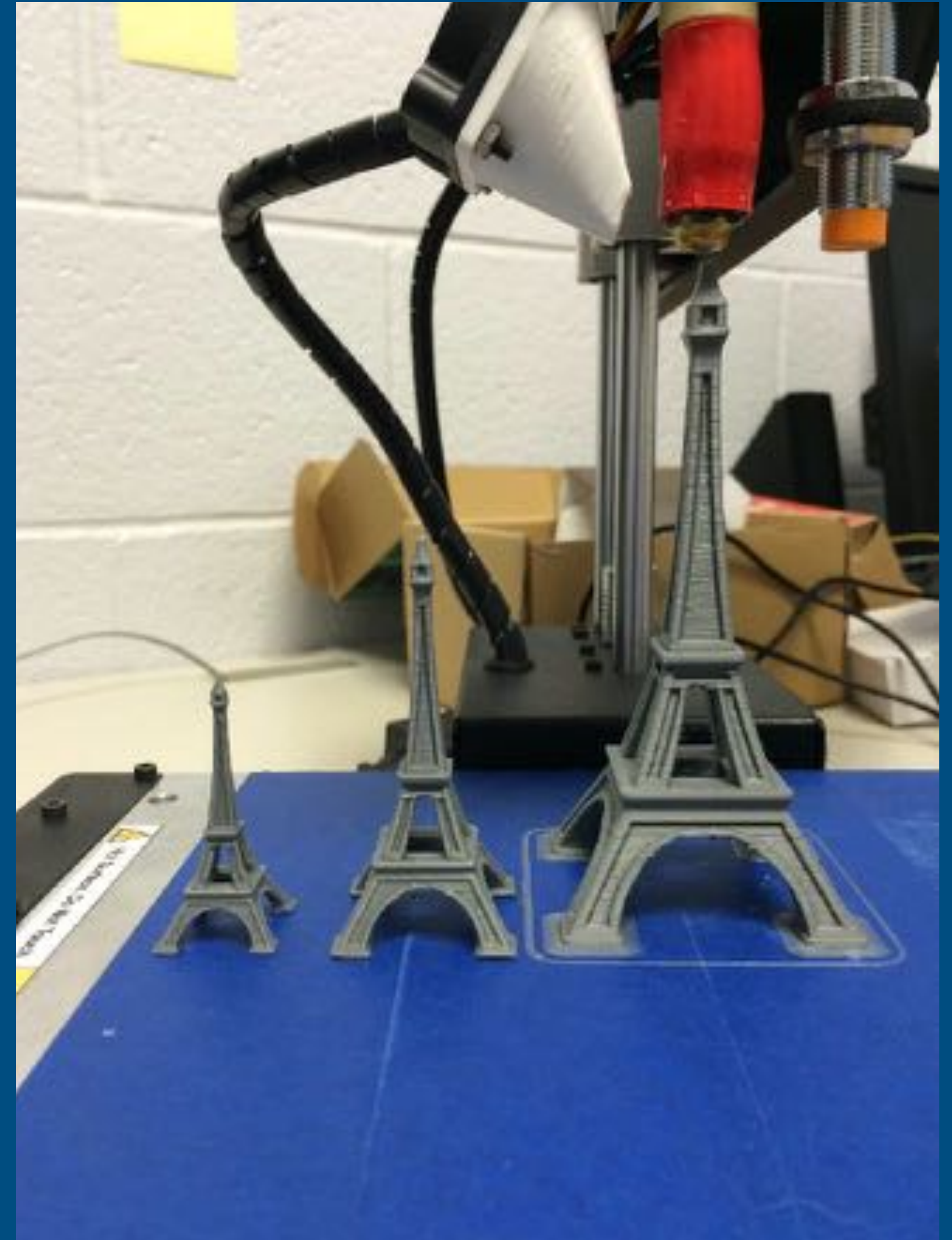


# WORLD LANGUAGES



## Famous Paris Buildings by LeFabShop

<http://www.thingiverse.com/thing:311002>





# TACTILE WRITING PROMPT

<http://www.thingiverse.com/thing:90193>





# ART

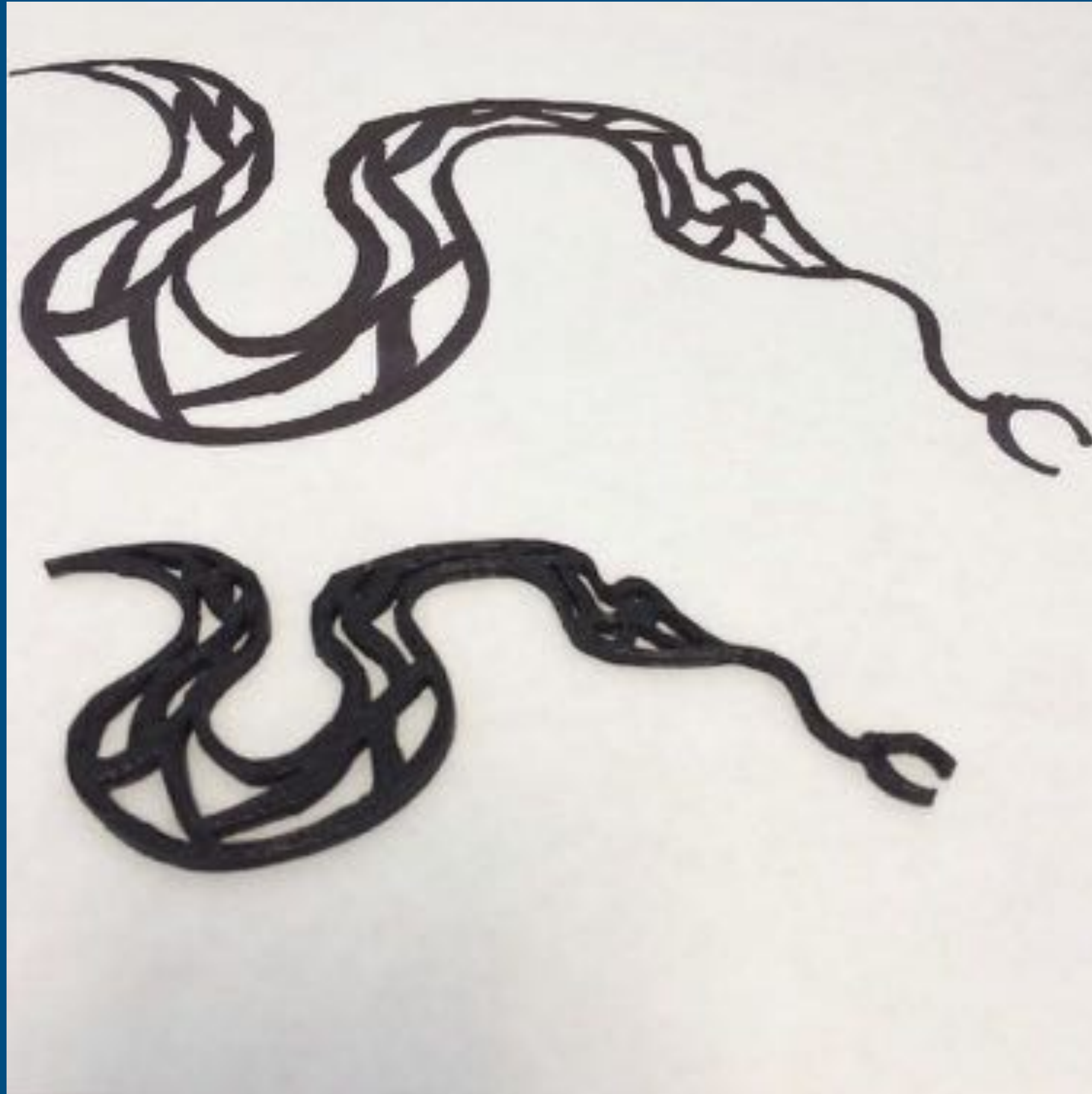
3dp.rock/lithophane



Josh Ajima - DesignMakeTeach.com



# ART





# SPINAL DISC RESEARCH

High School Research Student

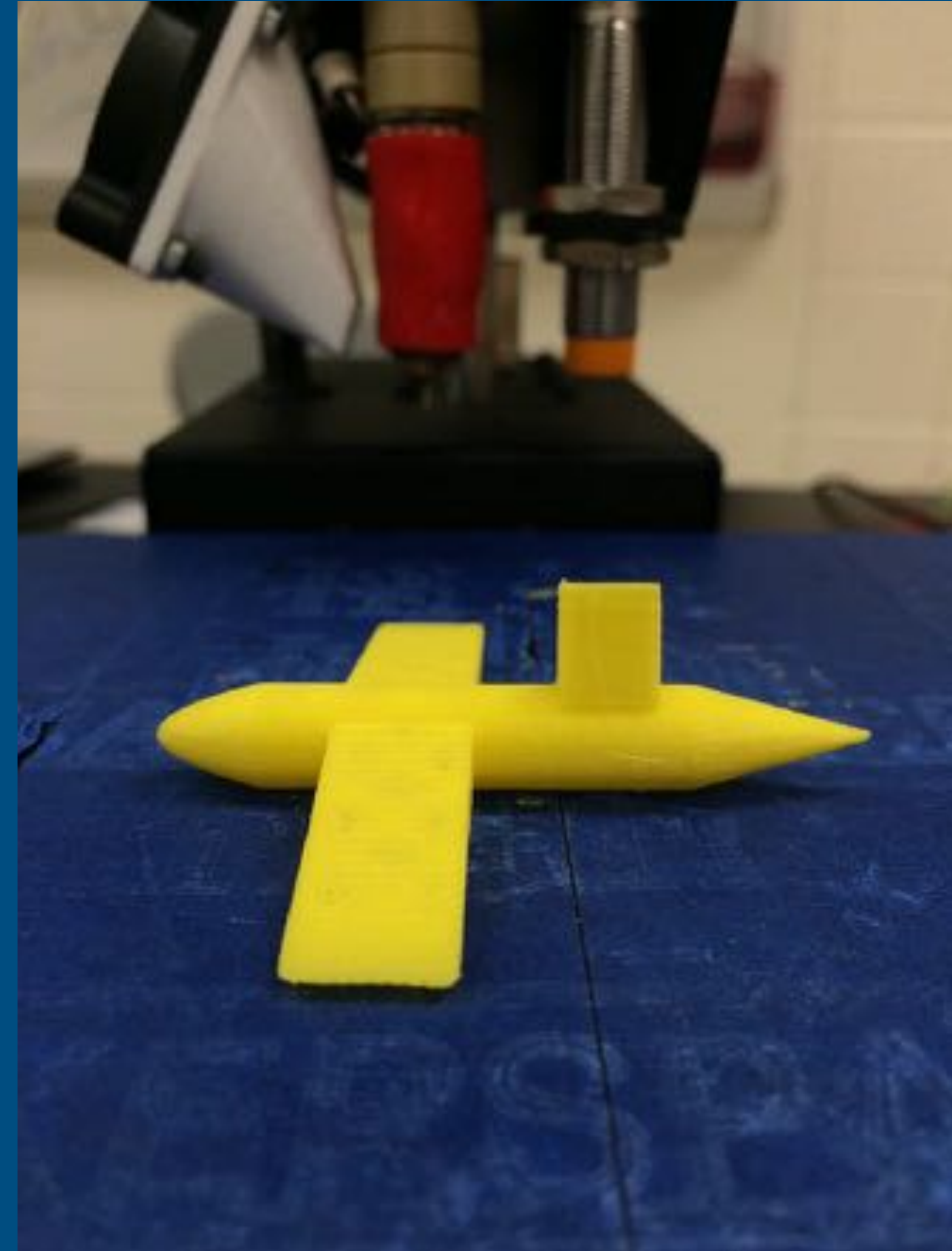
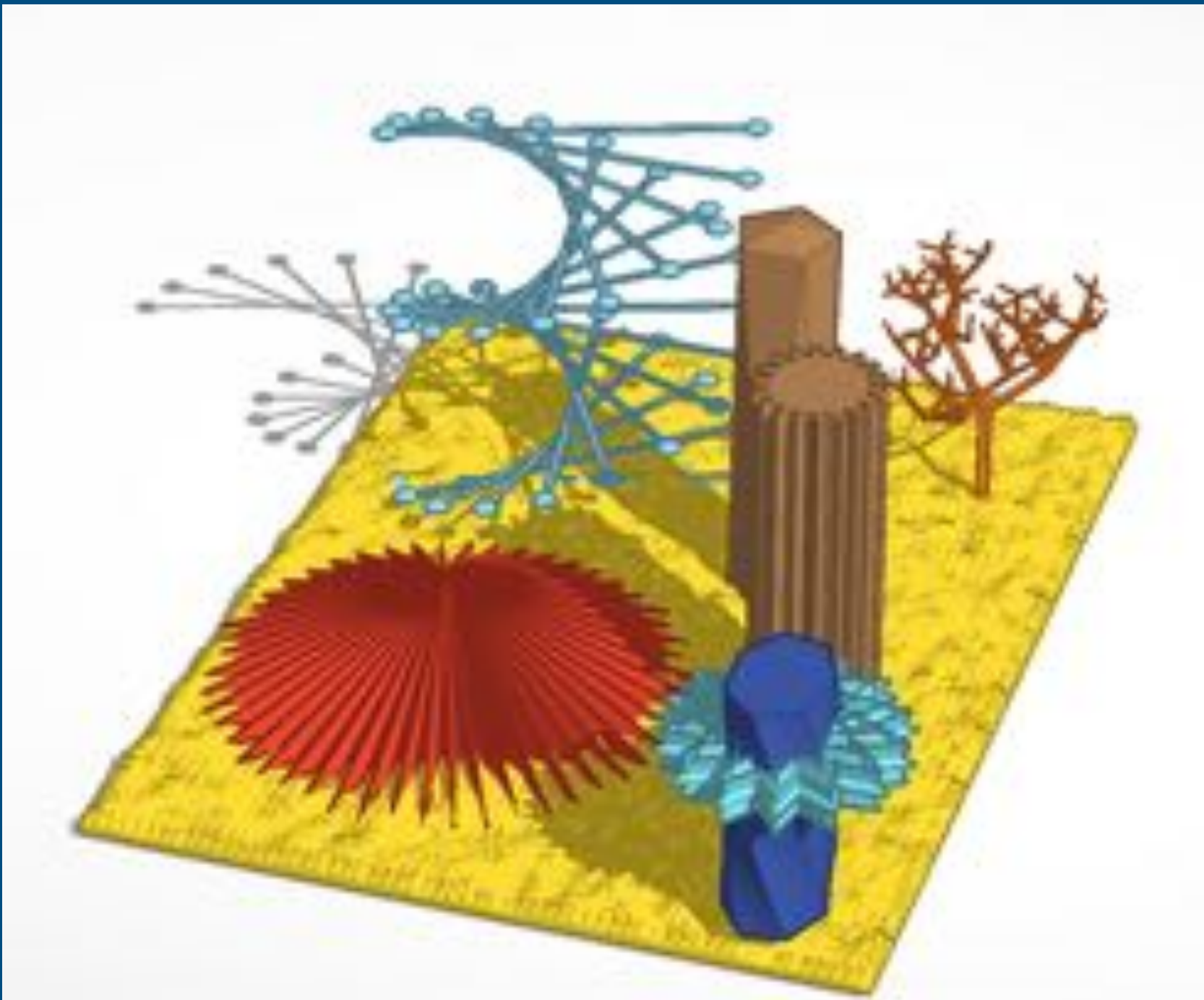
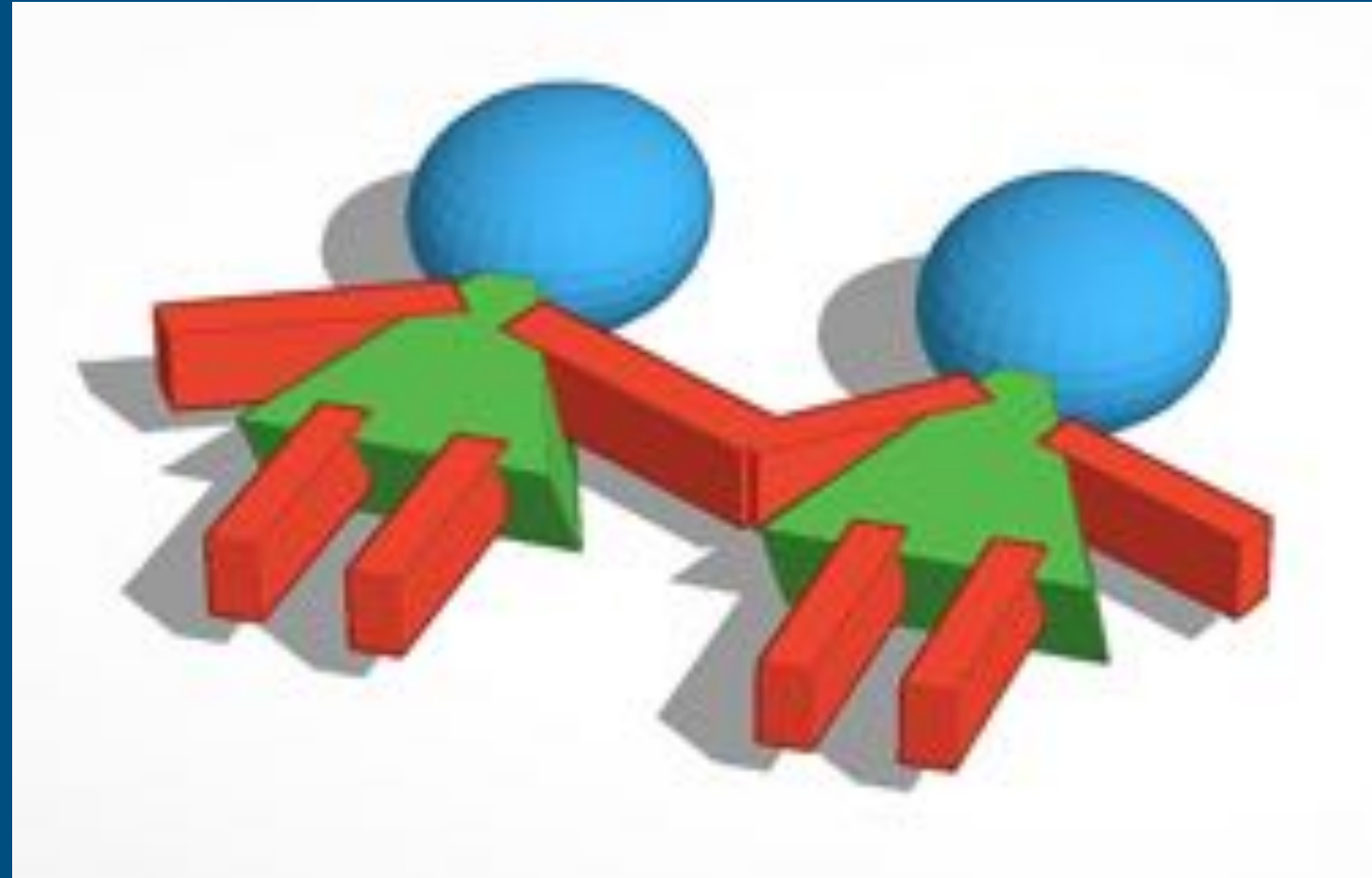
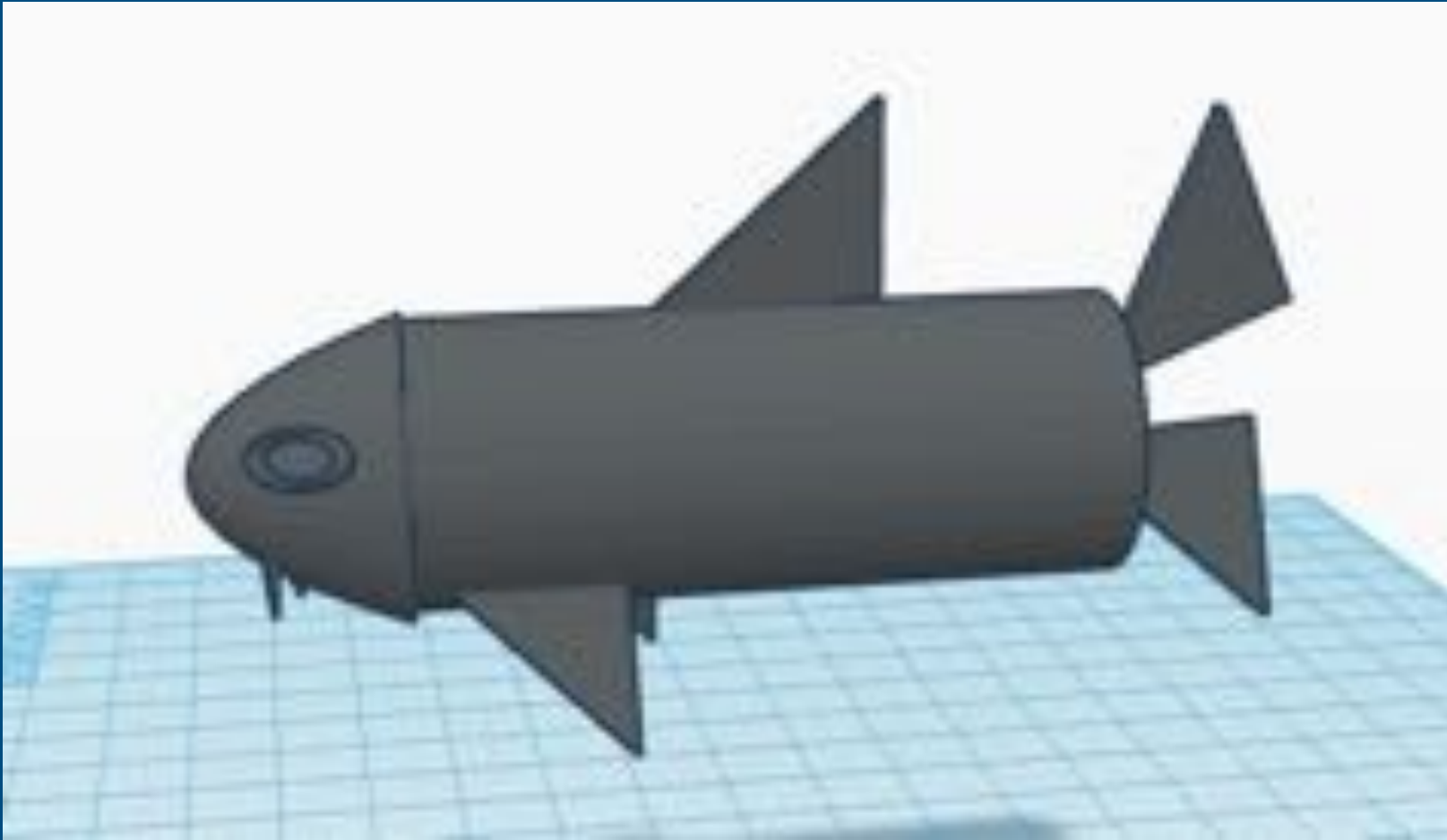


Josh Ajima - [DesignMakeTeach.com](http://DesignMakeTeach.com)



# STUDENT DESIGNERS

tinkercad.com



Josh Ajima - DesignMakeTeach.com



# 3D GUMBALL GALLERY

Student models courtesy Wendy Ahart

## River Bend Middle School Makers



Josh Ajima - DesignMakeTeach.com



# 3D GUMBALL GALLERY





# PRINT IT FORWARD - 3D PRINTER FUNDRAISER KIT

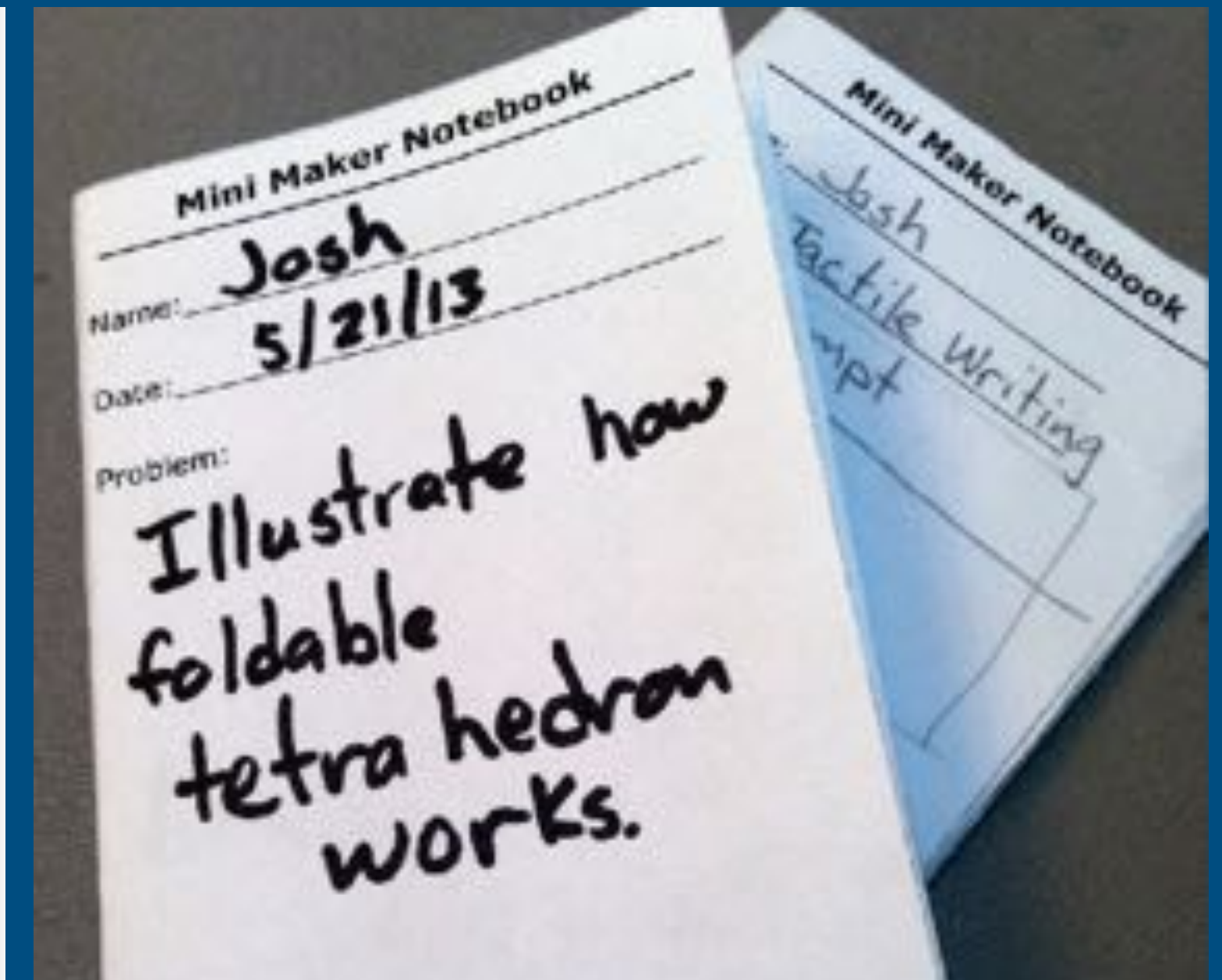


Josh Ajima - [DesignMakeTeach.com](http://DesignMakeTeach.com)



# SHARING

<http://www.thingiverse.com/thing:93186>



Josh Ajima - DesignMakeTeach.com



---

# Challenge

Create a 90 sec video describing your 3D Printing Project that Matters.

<https://flipgrid.com/03fbf9>





# HANDOUTS & CONTACT INFO



[DesignMakeTeach.com/TCEA](https://DesignMakeTeach.com/TCEA)

**Josh Ajima**

**@DesignMakeTeach**

**DesignMakeTeach.com**

**[youtube.com/designmaketeach](https://youtube.com/designmaketeach)**





# Provide Your Feedback

Remember to evaluate my session!

Complete this session's survey within the event in the TCEA Mobile App or visit [www.tcea.org/surveys](http://www.tcea.org/surveys).