

# 3D Printing: Engaging the Liberal Arts in Physics

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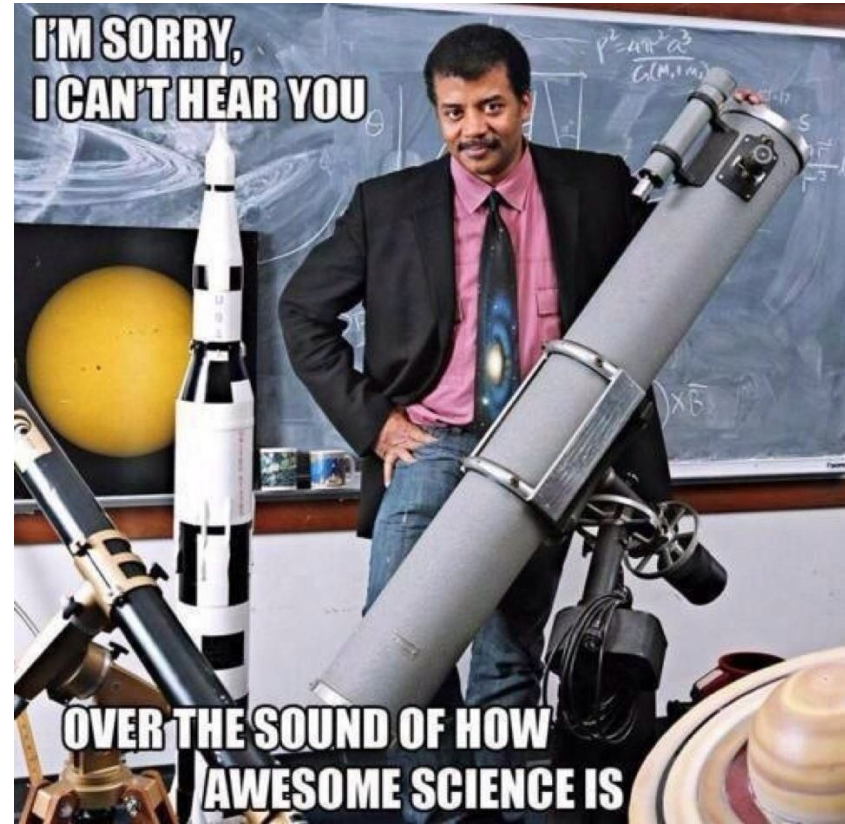
CSAAPT - Fall 2016

# Student Population

Liberal Arts students -

Art, biochemistry, biology, business, communications, cybersecurity, education, fashion design/merchandising, graphic design, pre-PT, history, IT, journalism, mathematics, politics, psychology, sociology, undeclared

(~28 majors - NONE physics)



# Incite REAL LIFE excitement!

Most students are (often) “into” tech

Use TECHNOLOGY as a springboard to science interest/engagement

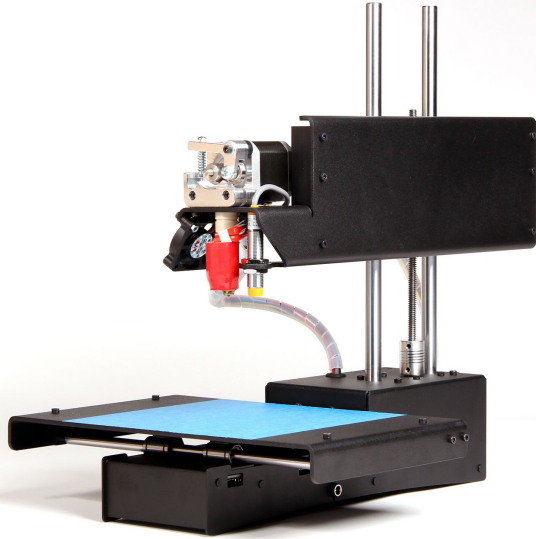
Find a technology that students (almost) universally are interested in

Find a technology that has some social good (a PRIMARY aspect of many Marymount student interests ESPECIALLY the more liberal artsy ones!)



SOURCE: [Mitch.blogspot.com](http://Mitch.blogspot.com)

# How to get students EXCITED about science?



[printbot.creativetools.se](http://printbot.creativetools.se)



The top right corner of the slide features a decorative arrangement of overlapping triangles in various shades of blue, including dark blue, medium blue, and light blue.

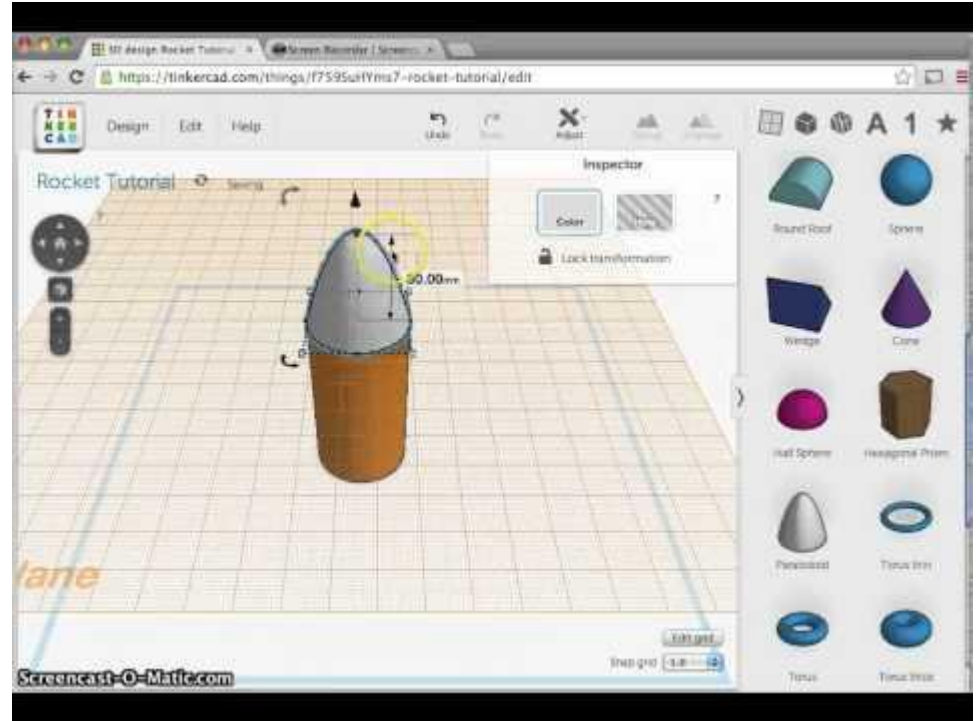
Finding Objects to Print - Give  
Students a Goal!

# 3D Design

Introduce to 3D design software

(tinkercad, Fusion 360)

- Vector Mathematics
- 3D perception
- Programming
- Scaling
- Unit Conversions



# 3D Scanning

Introduce to 3D scanning

(Occipital Structure, Intel real sense)

- Point Clouds
- Infrared cameras
- EM Radiation - IR
- Depth Sensing
- MORE Vectors
- CALCULUS!
- Computer programming



# 3D Models

Thingiverse, Shapeways

- TONS of models
- REALLY motivates students to want to learn

Thingiverse

DASHBOARD

EXPLORE

EDUCATION

CREATE

Enter a search term



Explore: POPULAR

ALL



Micro Catapult  
by LukeTansell

Sep 10, 2016



1313

1351

19



The \$30 3D scanner (update)  
by daveyclk

Sep 9, 2016



1168

1091

30



Customizable Furniture Minis  
by mathgrrl

May 15, 2014



1324

1371

12



# Give them a higher purpose

- SHOW students the impact  
They can have with BASIC  
Science applied to technology
- Enabling the Future



# VARIETY of designs



# 3D Printed hands as a lab practical

Students must APPLY physics to assess hand functions

- Force
- Tension
- Torque
- Rotational Motion
- Friction
- MOST of 1st semester intro mechanics!



# Does it Work - VERY Preliminary...

