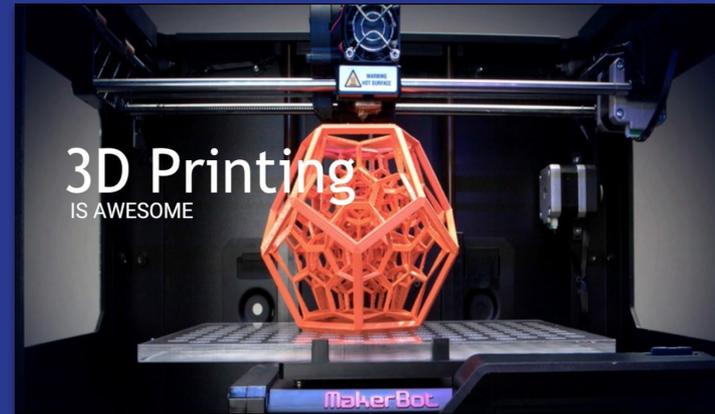




# 3D Printing and CAD

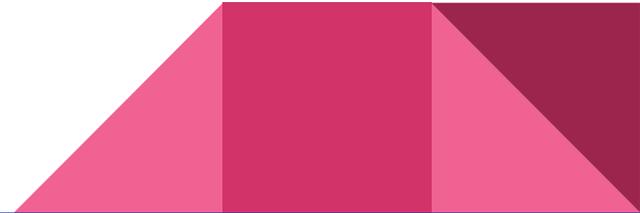
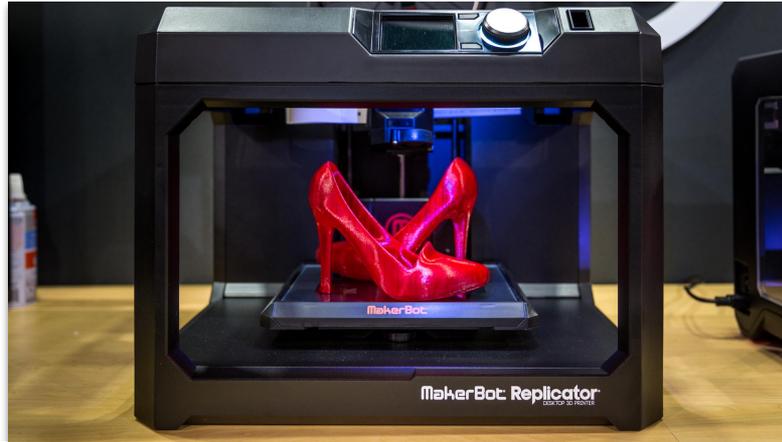
By: Mahathi Gopinathan, Arthi Vijayakumar, and Judelee Noel



# What is 3D Printing?



- 3D printing is a form of printing used to turn 3D models into solid objects
- Each model is built up in layers, starting at the bottom and rising up
- 3D printing uses a plethora of materials to create models
- Layers are built as slim, horizontal cross sections of the future product
  - Layers are printed up the z-axis
- 3D printing is a form of additive manufacturing (AM)



# A Very Brief History of 3D Printing



## The idea for 3D printing is created

Hideo Kodama creates a very early version of the 3D printer. 3 years later, Charles Hull invents stereolithography.



## 3D printing is actually used in medical practices

In 1999, the first 3D printed organ is inserted into the human body. This leads to even more advancements using 3D printing.



## The design for 3D printing changes

In 2005, the large and bulky design of the 3D printers becomes smaller and more efficient.



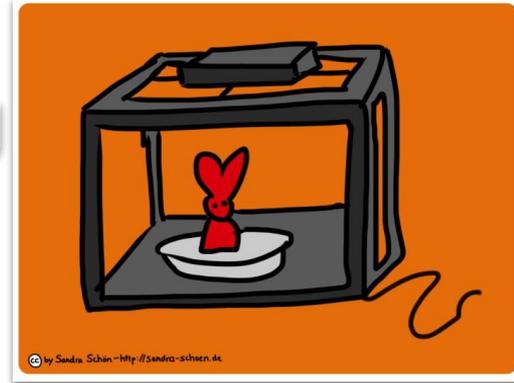
## 3D printing has come a long way

Wow, look at 3D printing now! As of 2018, people have been printing cars, chocolate, body parts, and so much more!



# A Few Different Types of 3D printing

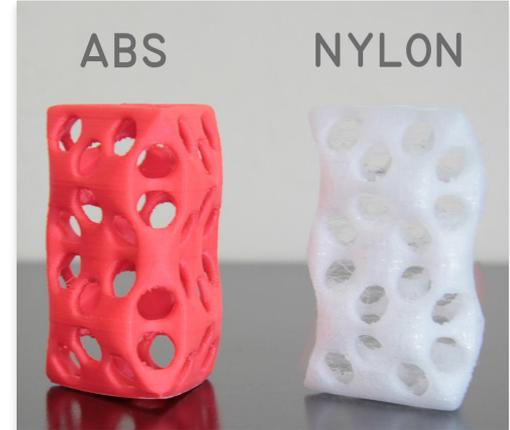
- Fused Deposition Modeling (FDM)
  - Most common type
  - Filament is heated up and extruded through the extrusion head
- Stereolithography(STL)
  - World's first 3D printing technology
  - Mirrors direct a laser beam at Resin to Solidify it
- Digital Light Processing(DLP)
  - Similar to STL
  - Uses a digital projector instead of a laser beam



# What Materials Can Be Used to 3D Print?

- ABS (type of plastic, very common material used)
- Nylon
- Resin
- Stainless steel
- Gold/silver
- Ceramic
- Etc.

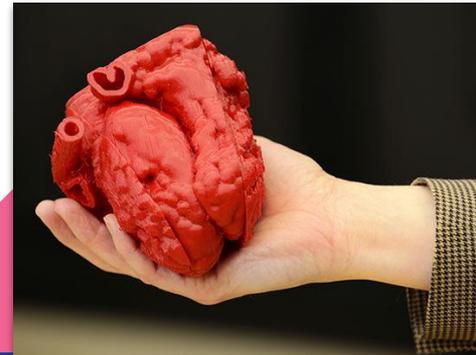
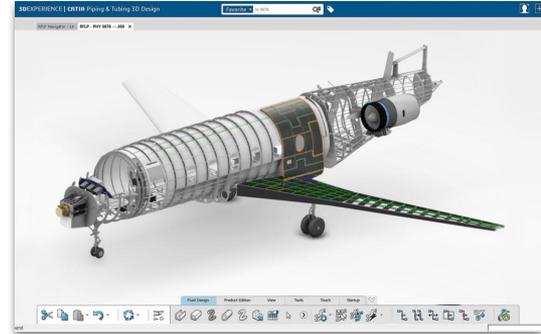
Resin



# Different Fields That Use 3D Printing



- Medical
  - Prosthetics, tissue, body parts, etc.
- Aeronautics and Space
  - Prototypes, functional parts, etc.
- Fashion
  - 3D printed clothes, new materials , etc



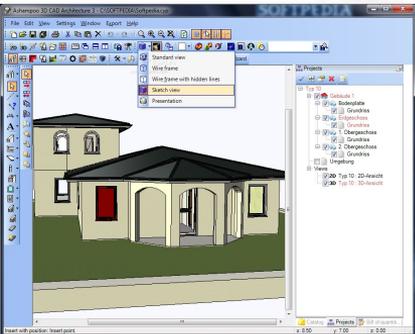
# What is CAD?

- CAD: Computer Aided Design
- Most commonly used to make designs to 3D print
- It's used by architects, engineers, drafters, and artists.
- Using CAD, users can make 3D prints using a variety of different methods
- CAD and 3D printing can be used for many different things
  - Prosthetics
  - Body parts + tissues
  - Chocolate
  - Fashion
  - Cars
  - Architecture/interior design
  - Etc.



# Different Fields That Use CAD

- Different types of engineering
  - Civil, computer, electrical, environmental, mechanical, etc.
- Architecture and interior design
  - For models and plans
- Sciences
  - Models, designs, drawings, etc.
- Medical
  - Anatomy drawings, illustrations, models, etc.
- Entrepreneurs and salespeople
  - Pitch ideas, model future products



# Different Types of CAD Applications

- **Creo Parametric**
  - Relatively large, used by many working in different fields
- **SolidWorks**
  - Used by many tech giants, very big in numerous industries
- **Onshape**
  - Used by hundreds of companies, very modern design, used very often
- **Autodesk Inventor**
  - Used in many different fields, similar to SolidWorks
- **Tinkercad**
  - Good for beginners, fun to mess around with



# Demo Slide

## DEMO SLIDE



This is a demonstration of how to use CAD to create a design that can eventually be 3D printed. There are many different sites and softwares that can be used to create models to print, and we decided on Tinkercad, a free software that lets you design a model at the click of a button (requires an account).

<https://www.tinkercad.com/things/cVVytaU7RbA-neat-trug/editv2>

# Any Questions?

## Any Questions?



Go to the link above to submit any questions to us. They will automatically be posted on the projector so if you wish to hide them, please request that in your question. If you like a question, you can vote on it. We will be answering only a few of the questions, in order to save time.

