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# Learn About 3D Printing

By Ben Eggler
Experiential Learning Specialist

# Upcoming Classes

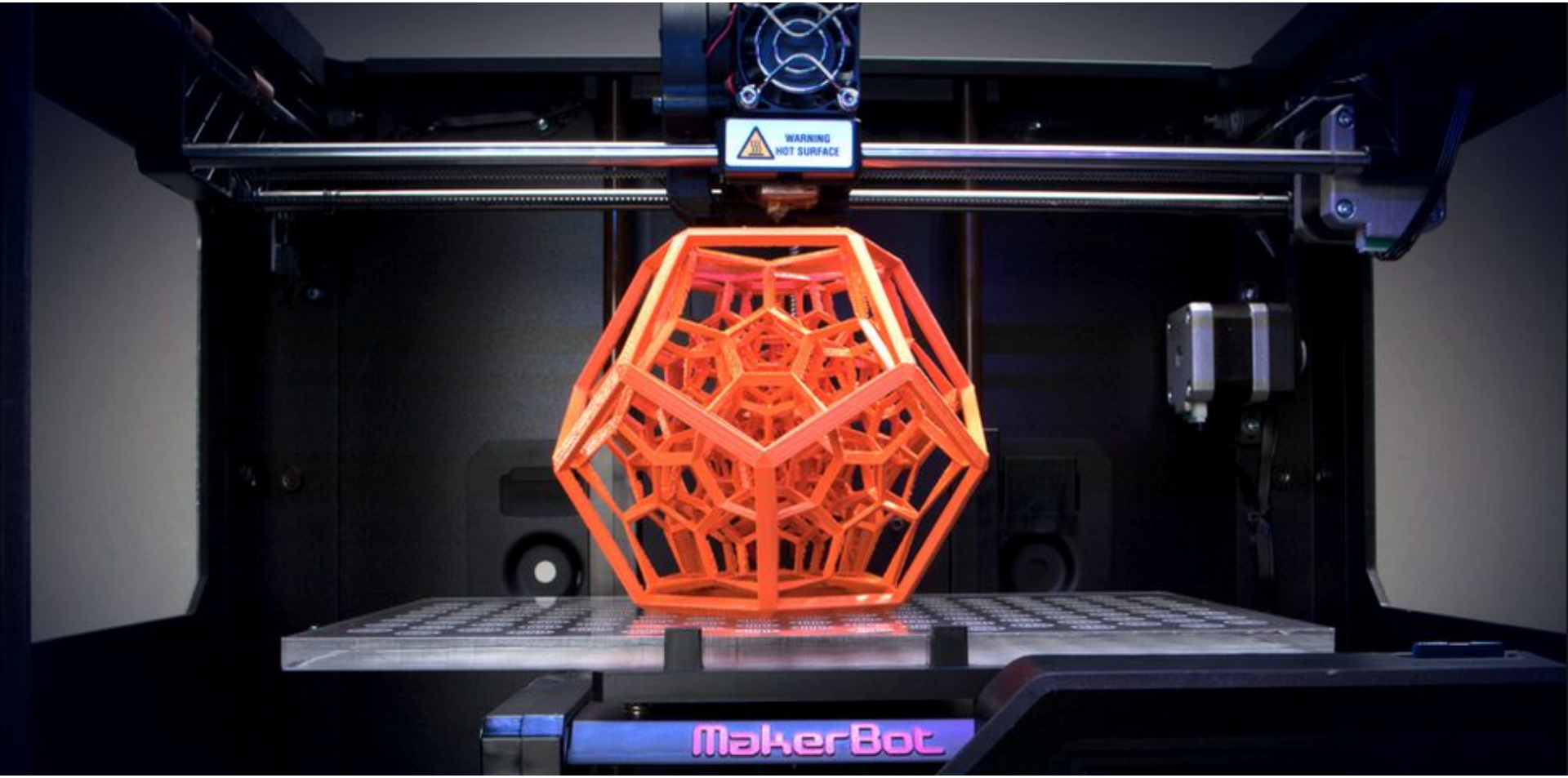
- Using Google for Job Searches 12/05/18
  - 11:00 AM - 12:30 PM
  - Computer Classroom

# Classroom

- What is 3D Printing?
- Thingiverse - Download Files
- TinkerCad Introduction - Create Files
- 3D Print Demonstration

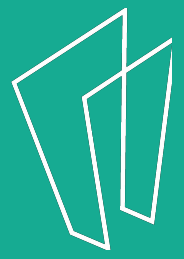
# What is 3D Printing?

- There are lots of ways to make things
- 3D printing is when you use a computer to make a real world object


WARNING
HOT SURFACE
MakerBot

# Printing with Plastic

- 3D Printers use a special type of plastic
- This is called **filament**
- The plastic is melted to very hot temperatures
- When it cools down, it becomes solid again
- PLA vs ABS




PLA
VS
ABS

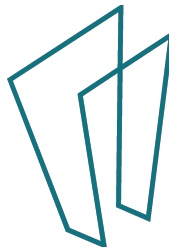
# PLA vs ABS

**ABS**

- High melting point
- Printed on heated platform
- Toxic fumes; requires ventilation
- Used for car parts, prosthetics, legos

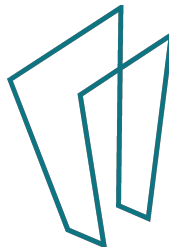
**PLA**

- Made from organic materials (cornstarch and sugar cane)
- Much lower melting point; may warp, crack, or melt under mechanical use and high temperature storage
- More for hobbyists



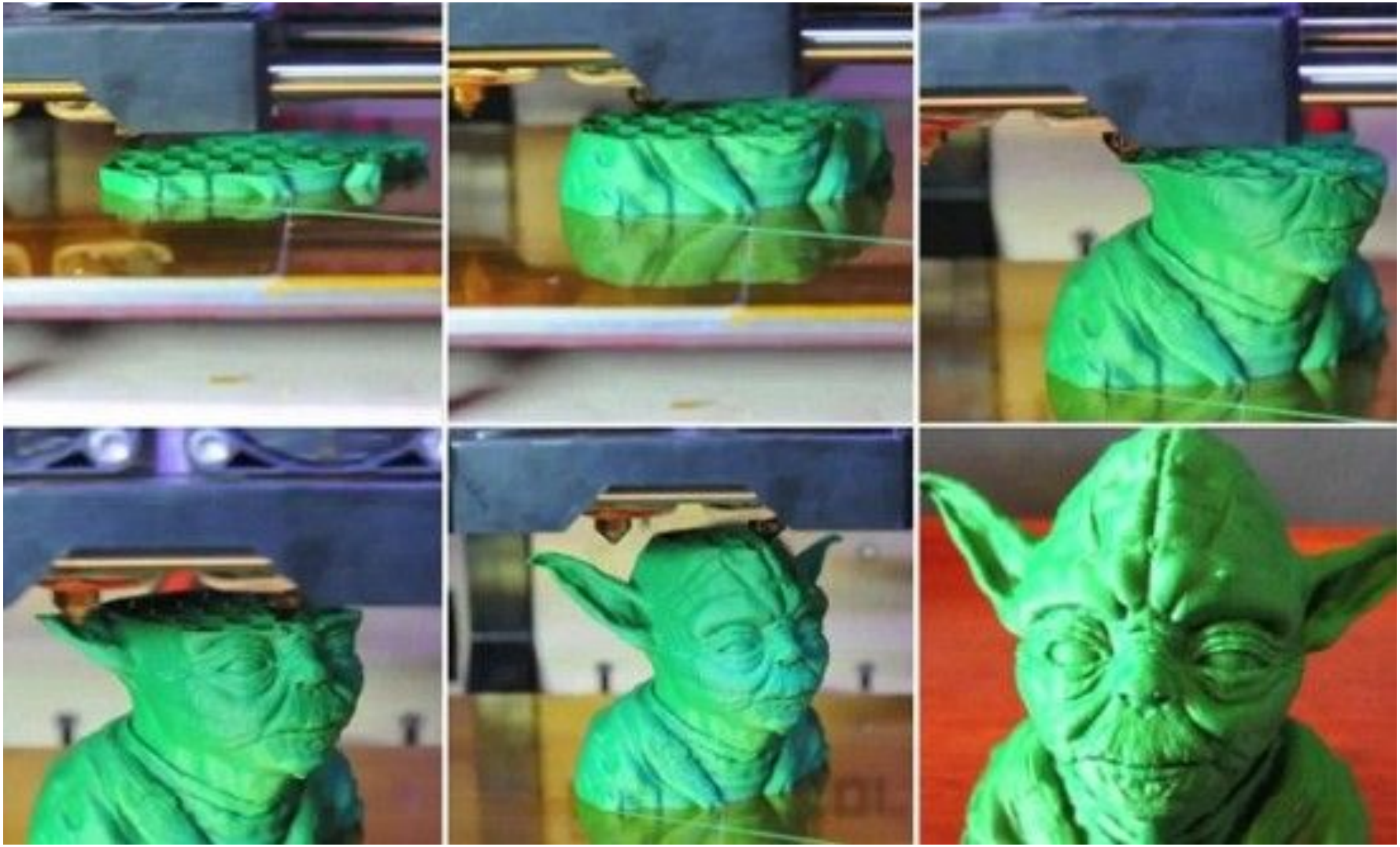
# Where did 3D Printers come from?

- 3D Printing has been around since the 1980's
- Used in factories to make **prototypes**
- Allows companies to make sure their pieces and parts fit together before going into mass production

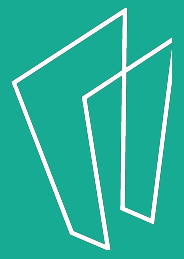


# Additive Printing

- 3D printers draw very thin layers of melted filament with the nozzle
- A print job gets taller as layer after layer is stacked on top of each other
- One layer at a time



# What can 3D Printers Make?



# Toys

# Toys

# Game Pieces

# Game Pieces

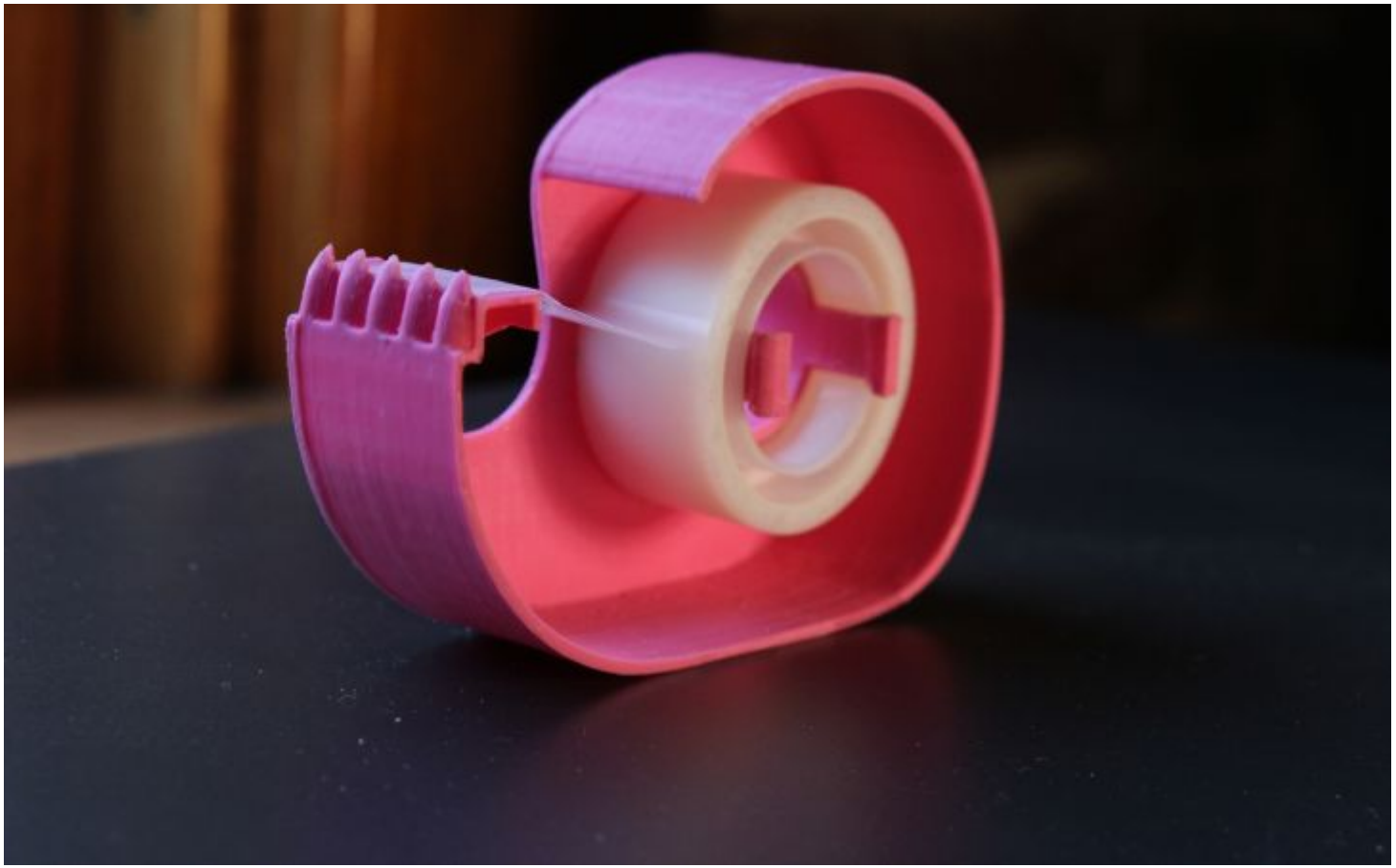
# Game Pieces

# Tools


# Tools

# Cookie Cutters


# Light Switch Covers



# Tape Dispenser

# Prototypes


# Prototypes

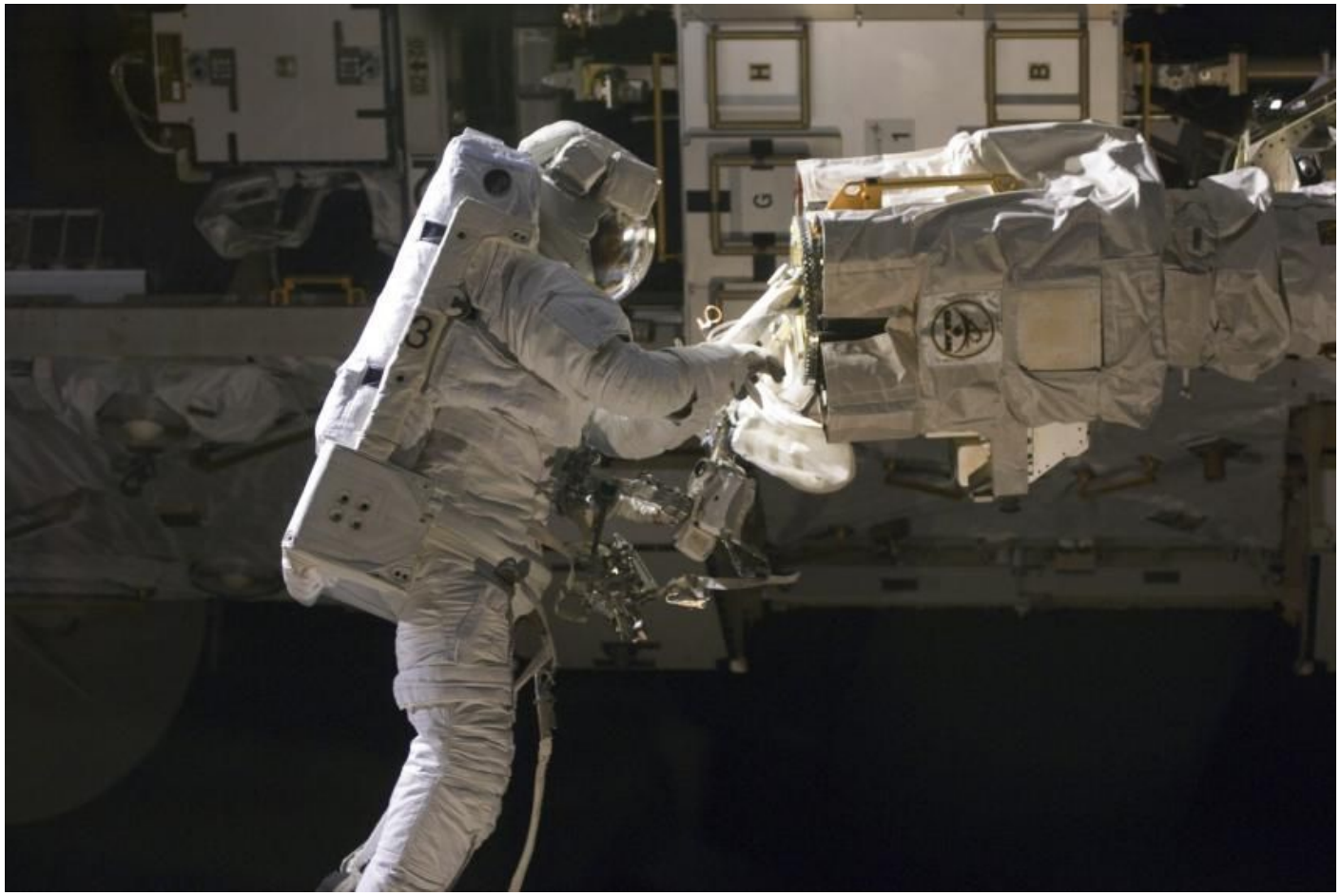

# Prototypes

# Prosthetics

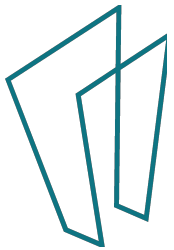
# Prosthetics

# Food


# Food



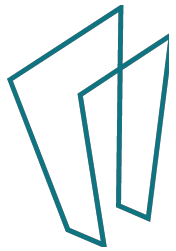
# Isolated Jobs

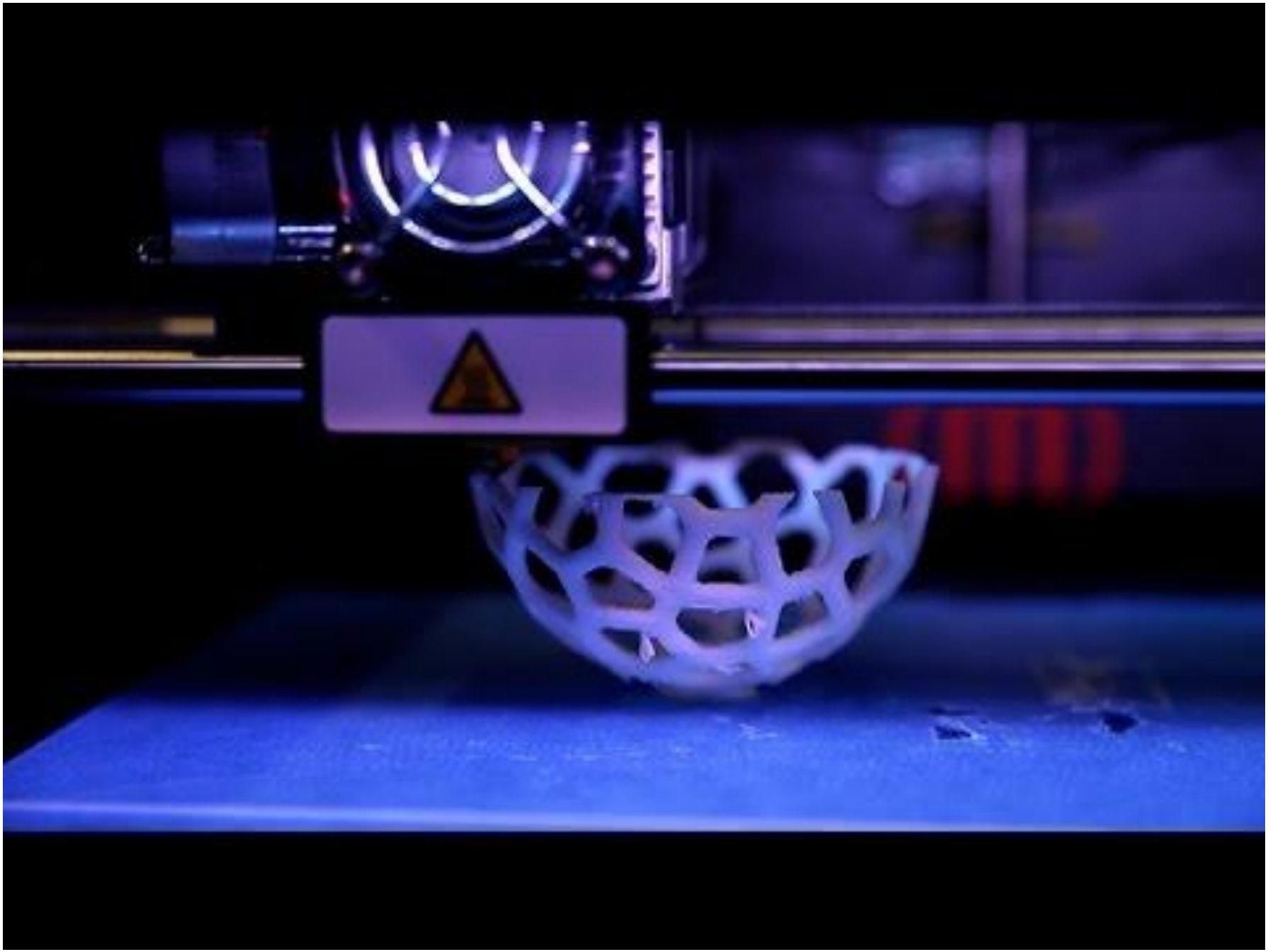


# Isolated Jobs

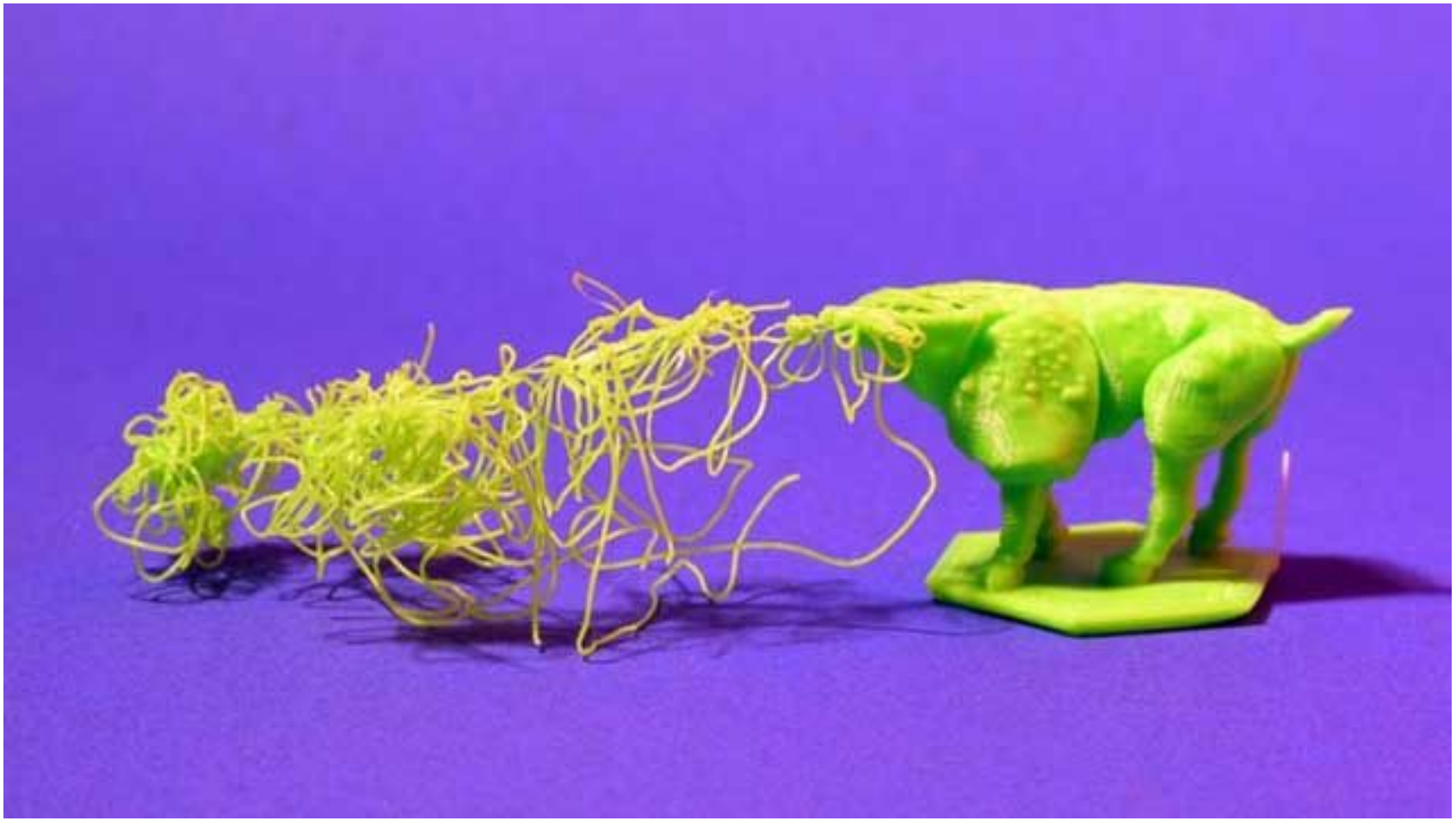
# How do you make or find designs?

- 3D scanners
- 3D modeling software like TinkerCad
- Websites like Thingiverse.com





# Failed Print Jobs

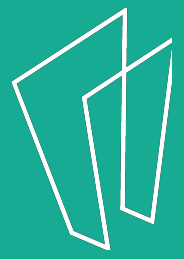



DELL

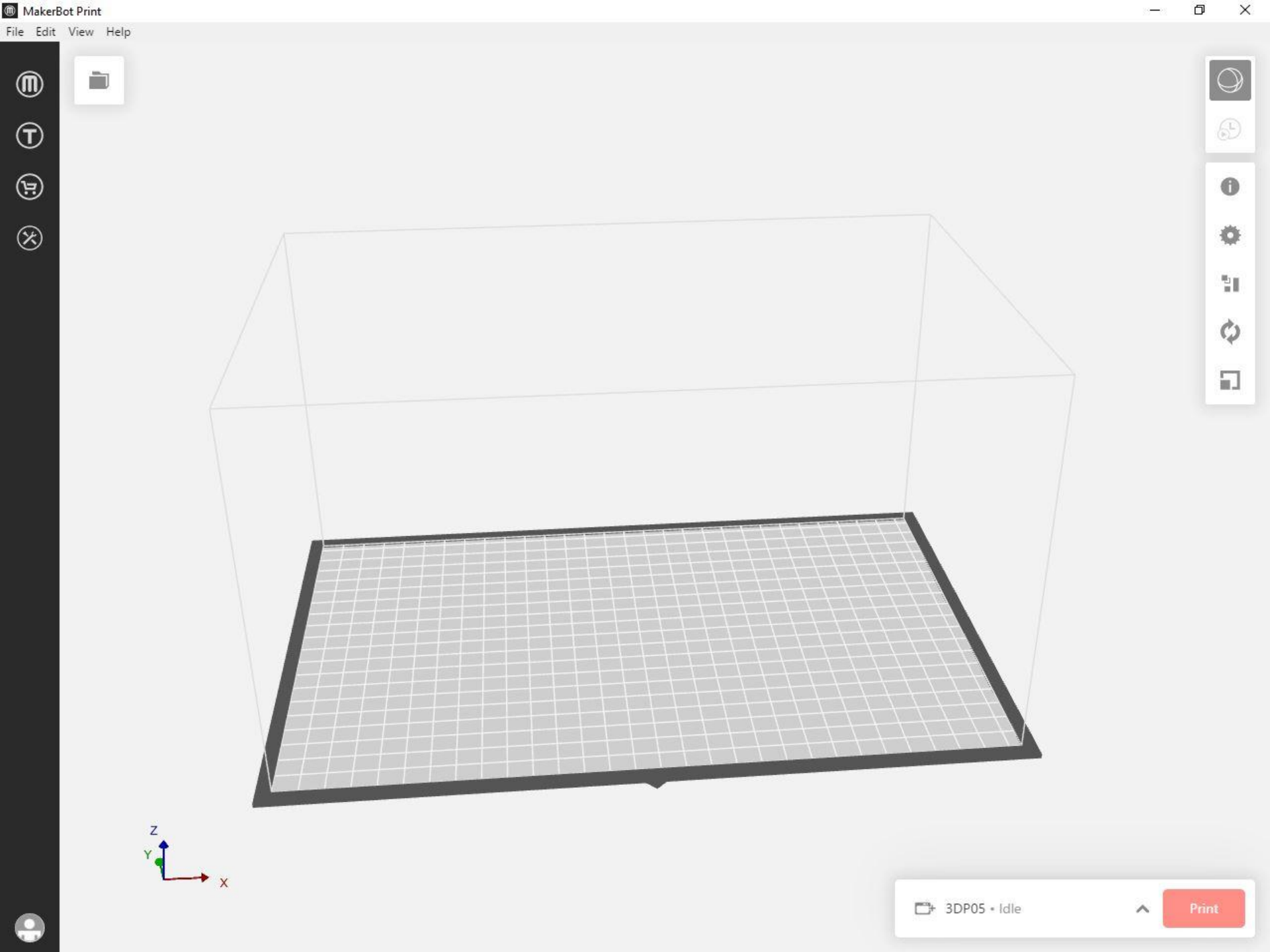
# Questions?

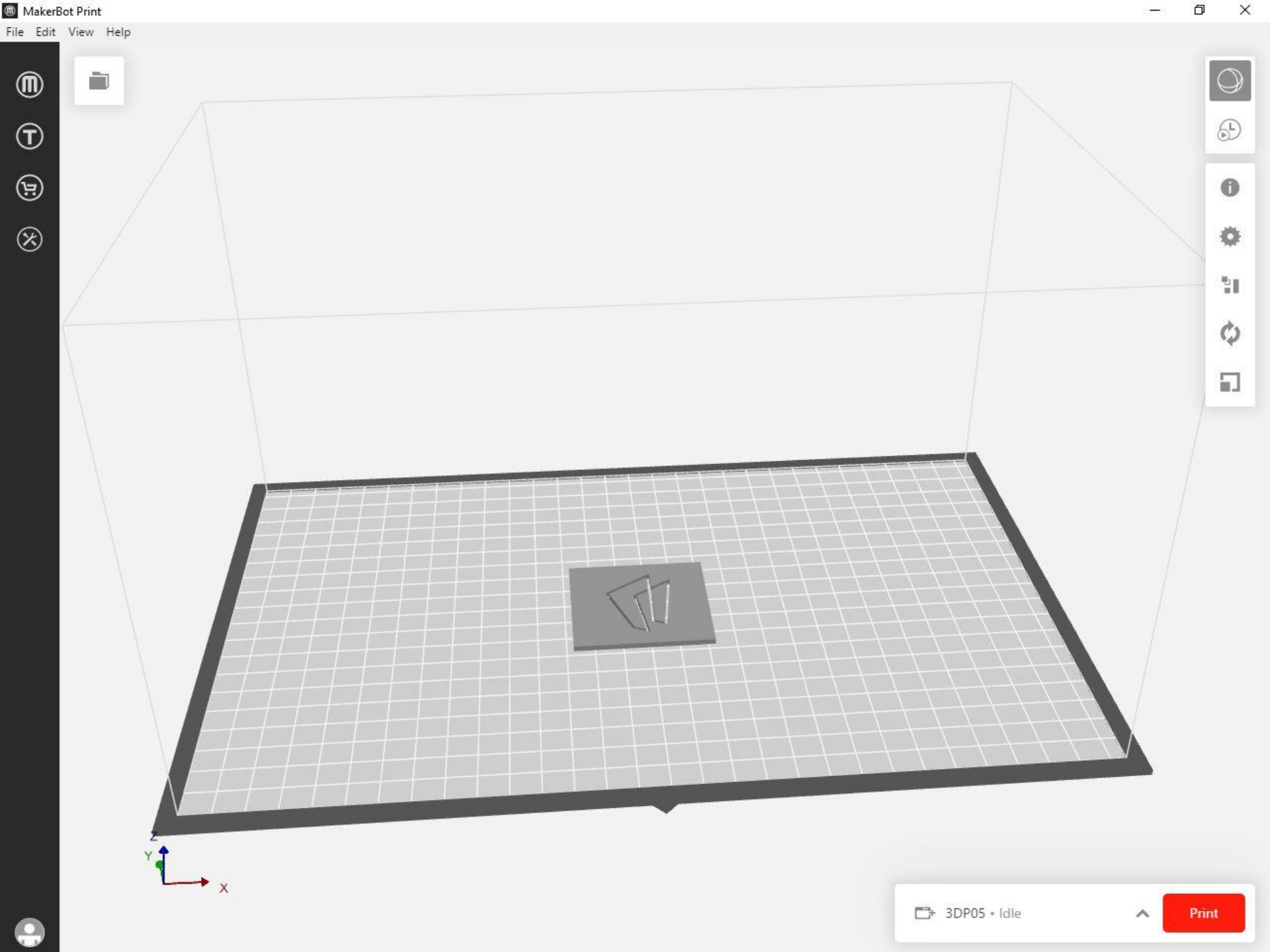
# Our 3D Printer Rules

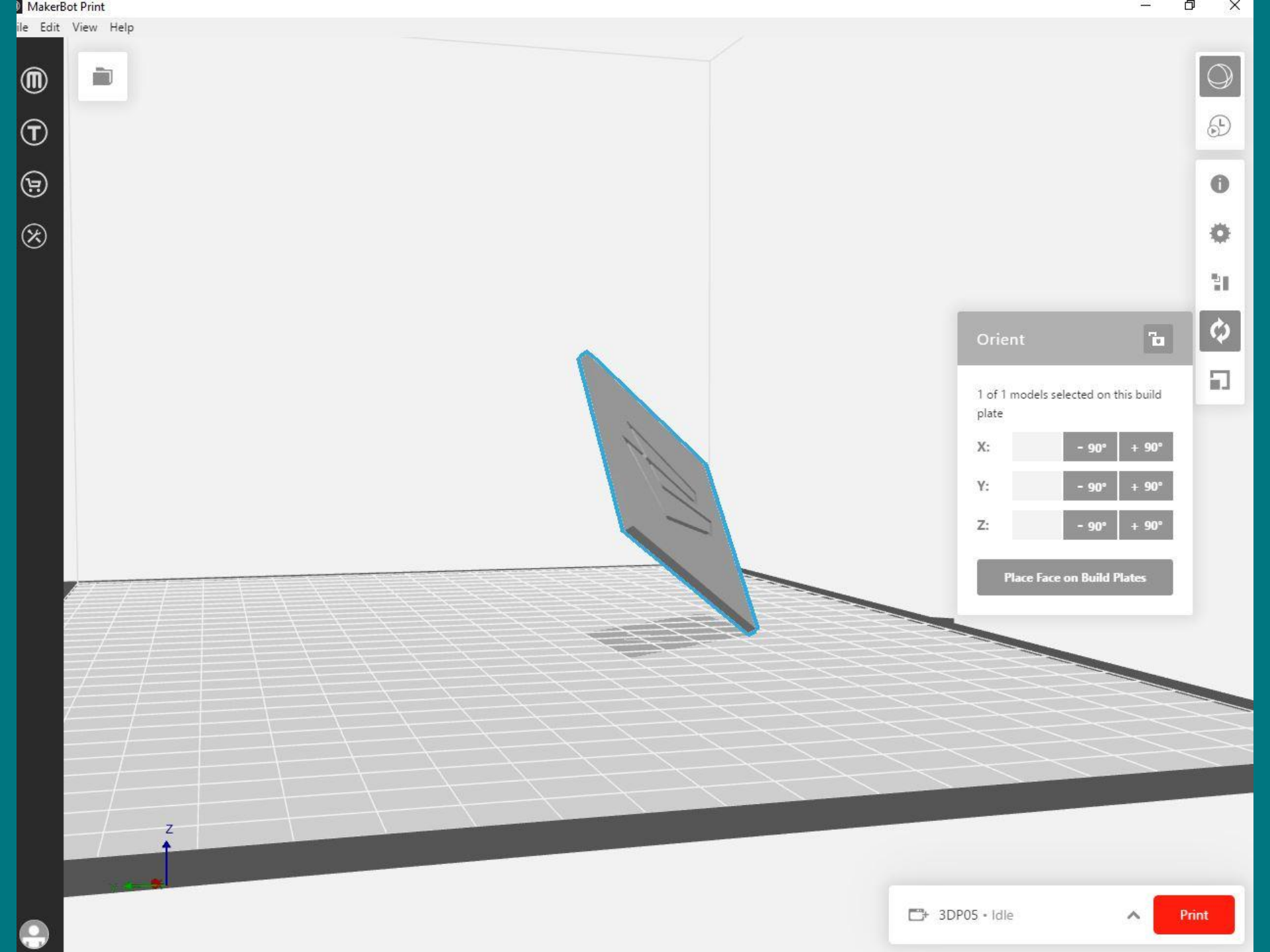
- Print jobs are **free**
- Limited to **2 print jobs** per month
- Print jobs up to **4 hours** or less
- Files up to 10”x8”x8”
- Print jobs held for **7 days**
- No color requests
- No weapons

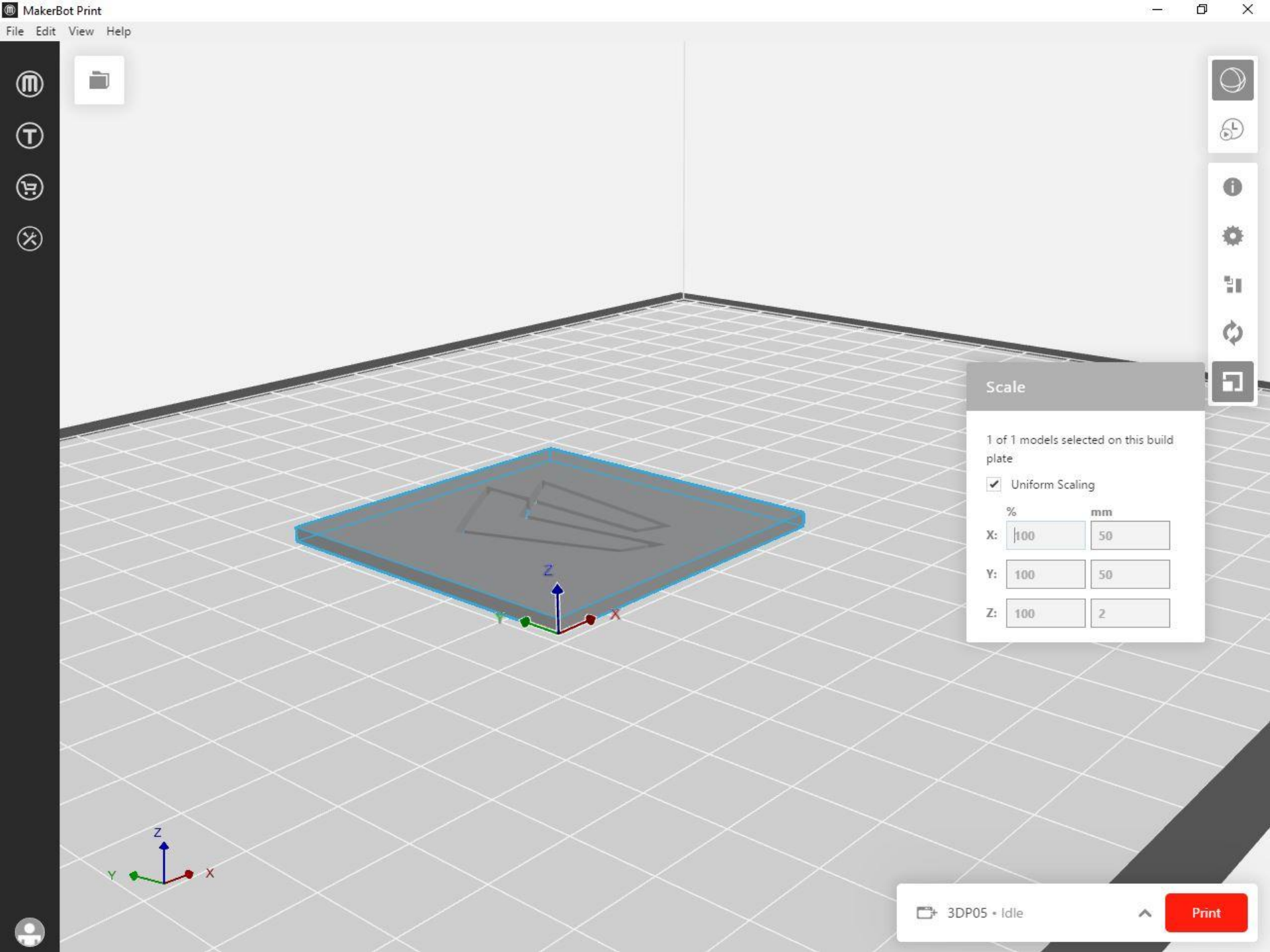


Red, Orange, Yellow, Green, Blue, Purple,
White, Tan, Grey, Black


MakerBot Print
File
Edit
View
Help
Z
Y
X
3DP05 • Idle
Print


MakerBot Print
File
Edit
View
Help
Z
Y
X
3DP05 • Idle
Print

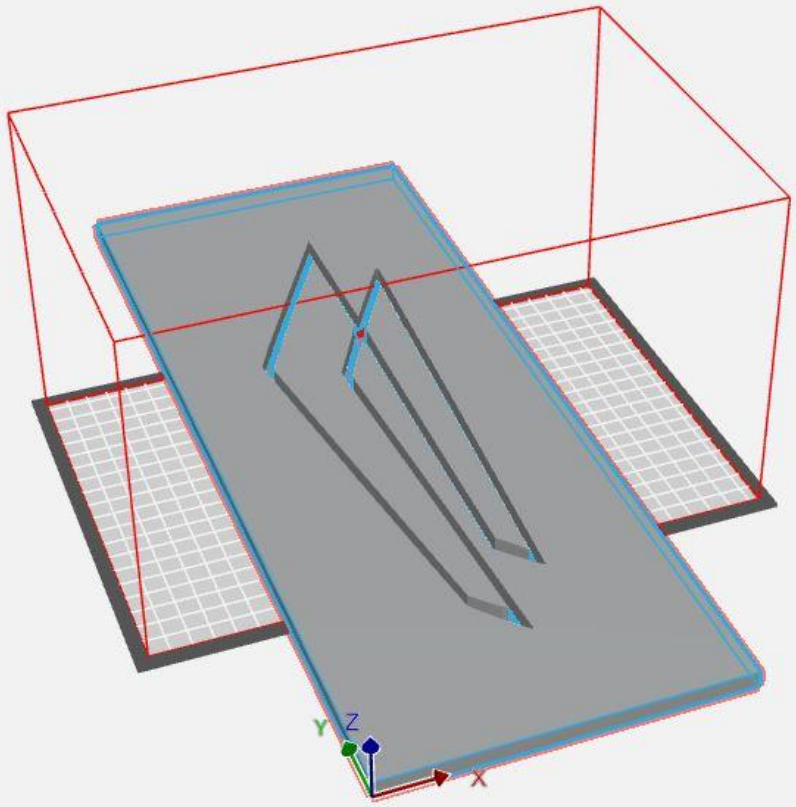

MakerBot Print
ile Edit View Help
Orient
1 of 1 models selected on this build plate
X:
- 90°
+ 90°
Y:
- 90°
+ 90°
Z:
- 90°
+ 90°
Place Face on Build Plates
Z
3DP05 • Idle
Print


MakerBot Print
File
Edit
View
Help
Scale
1 of 1 models selected on this build plate
Uniform Scaling
%
mm
X:
100
50
Y:
100
50
Z:
100
2
Z
Y
X
3DP05 • Idle
Print

MakerBot Print

File Edit View Help

Explore Thingiverse.com

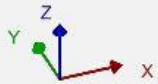



Scale

1 of 1 models selected on this build plate

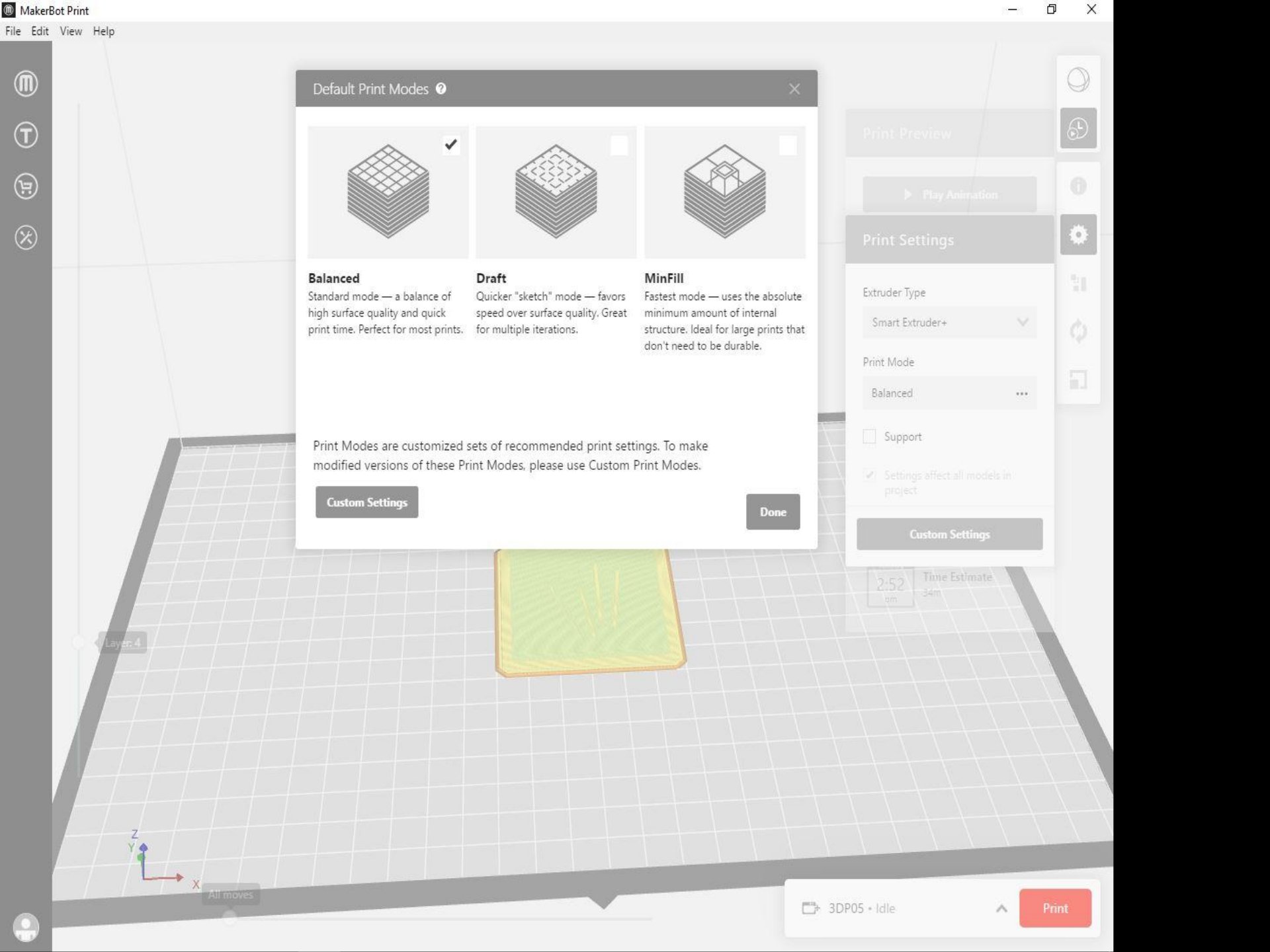
Uniform Scaling

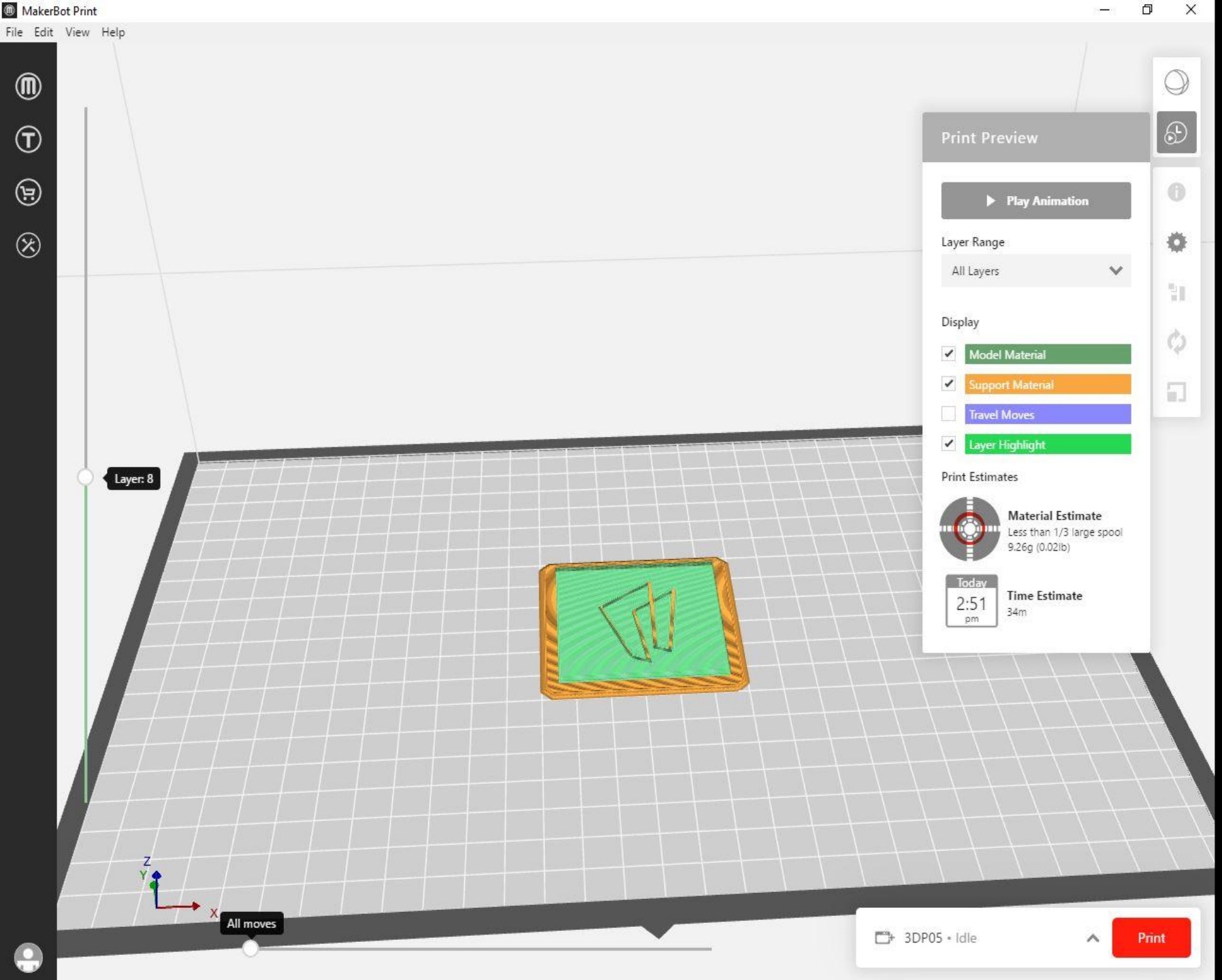
| | % | mm |
|---|---|---|
| X: | 347 | 173.5 |
| Y: | 900 | 450 |
| Z: | 400 | 8 |




3DP05 • Idle

Print


MakerBot Print
File Edit View Help
Default Print Modes
Balanced
Standard mode — a balance of high surface quality and quick print time. Perfect for most prints.
Draft
Quicker "sketch" mode — favors speed over surface quality. Great for multiple iterations.
MinFill
Fastest mode — uses the absolute minimum amount of internal structure. Ideal for large prints that don't need to be durable.
Print Modes are customized sets of recommended print settings. To make modified versions of these Print Modes, please use Custom Print Modes.
Custom Settings
Done
Print Preview
Play Animation
Print Settings
Extruder Type
Smart Extruder+
Print Mode
Balanced
Support
Settings affect all models in project
Custom Settings
2:52
Time Estimate
34m
Layer: 4
All moves
3DP05 • Idle
Print


MakerBot Print
File
Edit
View
Help
Print Preview
Play Animation
Layer Range
All Layers
Display
Model Material
Support Material
Travel Moves
Layer Highlight
Print Estimates
Material Estimate
Less than 1/3 large spool
9.26g (0.02lb)
Today
2:51
pm
Time Estimate
34m
Layer: 8
All moves
Z
Y
X
3DP05 • Idle
Print

MakerBot Print

File Edit View Help

Material Estimate
Less than 1/3 large spool
21.06g (0.05lb)

Ready by:
Today
4:02
pm

Time Estimate
1h 15m

3DP05
Replicator+

Selected

1%

Printing
1-SPL Logo
Current: 210 °C
Elapsed: 0h 0m
Remaining: 1h 14m

Pause Cancel Filament Utilities

3DP05 • Busy

Print

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