



Adafruit 3D Printed Chess Set

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<https://learn.adafruit.com/adafruit-3d-printed-chess-set>

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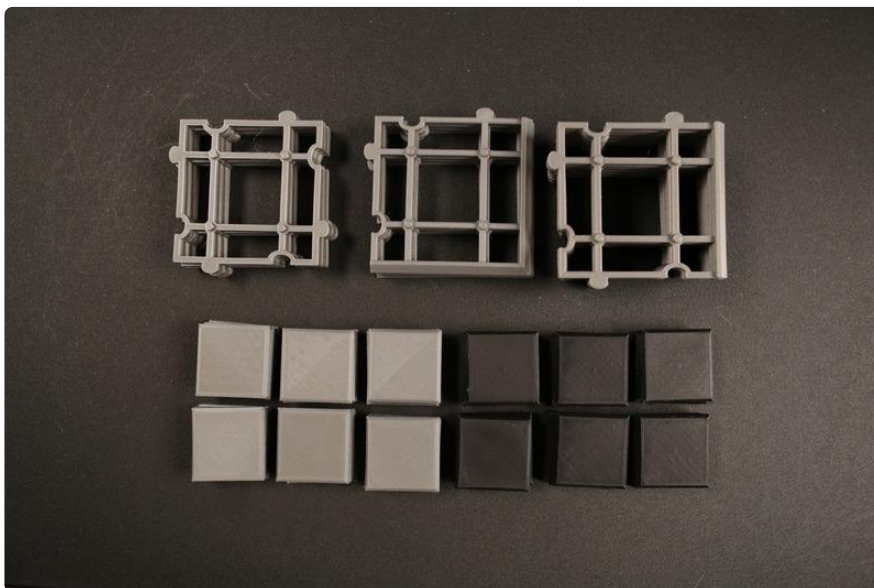
Overview



Circuit Playground Chess

Get ready to play with the Adafruit Chess set! It's entirely 3D printed and features players from Circuit Playground.

In this project we're using metal filament to 3D print the chess pieces. This filament contains actual metal particles. In this guide we'll take a look at how to get this shimmer and shine so it doesn't even look 3D printed.



Modular Chess Board

The chess board is a modular design that can be printed in regular PLA. The board pieces use puzzle like connectors that snap fit together. Assembly is like a puzzle game that doesn't take too long. Simply snap them together.



Prerequisite Guide

Check out these guide below for more details on using metal filament and polishing techniques.

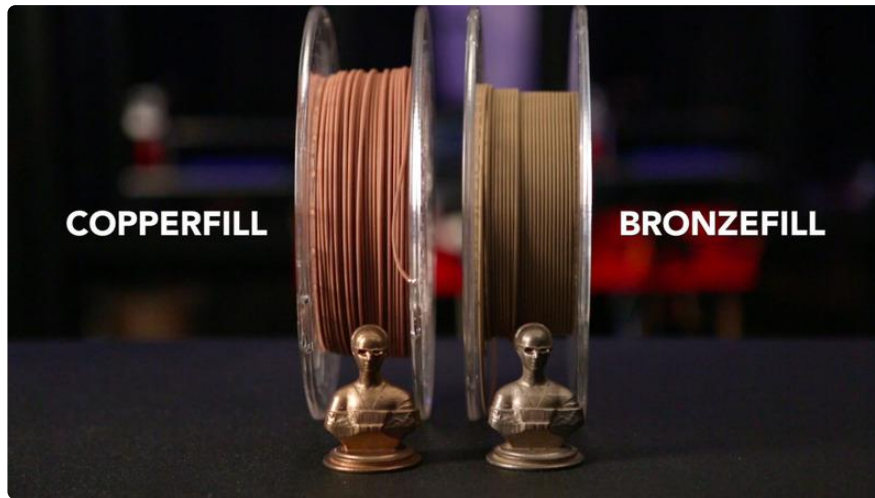
- [Polishing Techniques with copper/bronzeFill \(\)](#)

Parts and Materials

You'll need access to a 3D printer and filament (optional metal). For processing, we recommend using a rotary tumbler.

- 3D Printer
- copperFill
- bronzeFill
- Rotary Tumbler
- Brass screws
- Steel screws
- Flush snips
- Breathing Mask
- Gloves

3D Printing



Metal Filament

In this project we used copperFill and bronzeFill filament from ColorFabb. It's a special blend of PLA with actual metal particles that's 3x times heavier than regular PLA!

Extruder Types

Works with most direct drive and bowden systems.

Operating extruder temperatures

210-230C

Build Platform

Use Blue Painters Tape

Heated bed use 60C

Slice Setting

20% Infill

.15mm layer height

30mm/s Print Speed

2 Shells

230C Extruder

4 Bottom / 8 Top Layers

No Retraction

Download Files

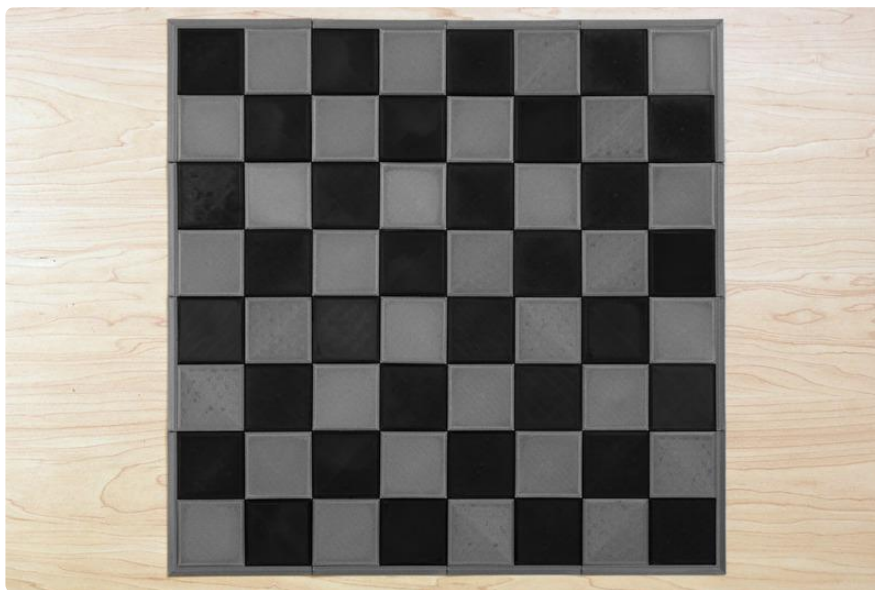


Characters

The characters are separated into pieces. The parts are optimized to print with no support material. The parts can be printed in PLA or metal filament. To prepare the parts for slicing, we oriented the parts to be in the center of the printers build plate.

| Name | Parts | Character |
|----------|---|-----------|
| Lady Ada | ladyada.stl | Queen |
| Mosfet | cat-top.stl cat-btm.stl | King |
| Adabot | adabot-knight-bot.stl adabot-knight-top.stl | Knight |
| Connie | connie-top.stl connie-btm.stl connie-legs.stl | Bishop |

| | | |
|------------------|--|-------|
| Cappy | cappy-top.stl cappy-legs.stl cappy-base.stl | Rook |
| Bully, Gus, Ruby | led-base.stl led-skirt.stl led-legs.stl led-top.stl | Pawns |



Chess Board

The chess board is a modular design that can be printed in regular PLA. Pieces that make up the board are separated into 3 different parts. You can choose any two colors as your alternating squares. The board pieces use puzzle like connectors that snap fit together.

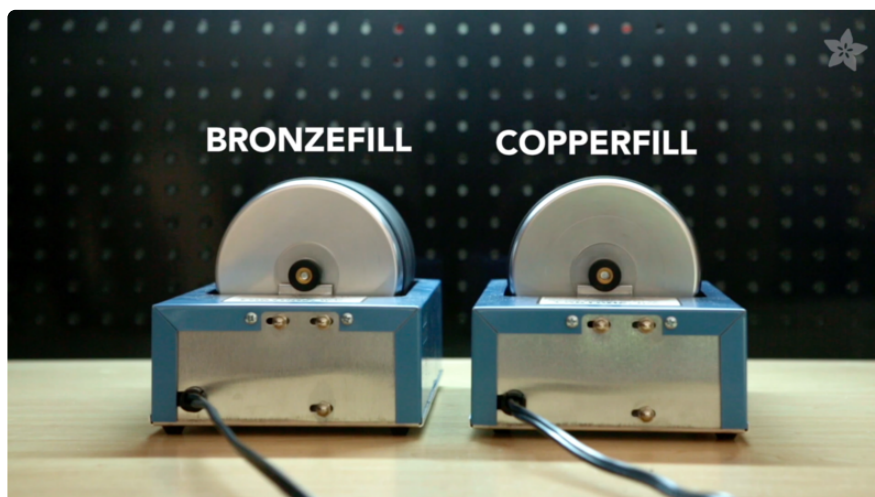
| Quantity | File name | Notes |
|----------|------------------|--------------------------------|
| 4 | chess-center.stl | Connects to corners and sides. |
| 4 | chess-corner.stl | Connects to the side pieces |

| | | |
|----|------------------------|--|
| 8 | chess-side.stl | Connects to corners and center pieces |
| 32 | chess-square-solid.stl | Filled square holds more weight |
| 32 | chess-square-shell.stl | Optional square. Shelled to save on time and material. |

Processing

Prepping Parts

Remove any stringy bits and pieces from the parts. Use a hobby knife or flush snips. Clean out the cavities for the legs as they may have overhanging areas.



Rotary Tumbler

We recommend using two different rotary tumblers. This helps speed up the process and avoids mixing and blending the two materials.



Tumbling Medium

Use screws as the medium. Steel screws for bronzeFill parts and Brass screws for copperFill. Using different metal screws will differentiate the tones.



New Screws

You'll want to use new screws - Old screws that are worn out will not give you as much abrasion.

To get this amazing finish, tumble each part for about 8 hours. So it's best to do it over night.



Health & Safety

Be sure to tumble in a well ventilated area, wear proper breathing mask and gloves for safety.

Tumbling Tips

You'll have to tumble each part separately to avoid any damage during the tumbling process.

You can toss the part back in if the surface isn't completed polished. Remove any artifacts and clean the parts free from any left over dust.

Assembly



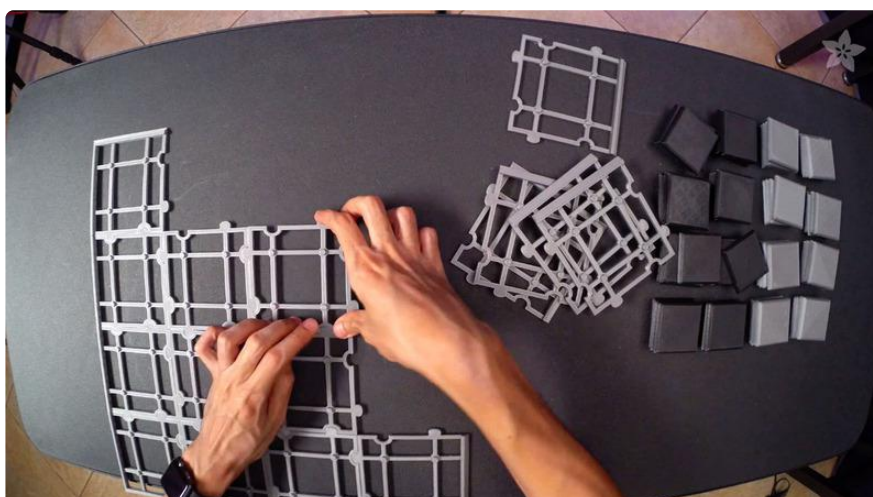
Adhesives

Use adhesives such as E6000 or super glue to permanently bond the pieces together. The tolerances in the parts have a 0.2mm clearance for parts that need to be connected.



Assembling Players

Insert the legs into the body first, then apply glue to the base. Be sure to align the legs by inserting them into the slots. Inserting the legs into the body before gluing helps properly align the legs.



Assembling Board

These have tight tolerances which gives the board a bit of flexibility but enough rigidity to move around.

Assembly is like a puzzle game that doesn't take too long. Simply snap them together. Each square is a standard 5cm piece which makes a full size 40 x 40cm chess board. The chess board requires no glue and everything just snap fits together.

Play



Game On!

Setup the pieces for each player and get yourself a worthy opponent.



Storage

If you printed the players in metal filament, you should store them in a dry air-tight container to avoid the copper from oxidizing or getting dusty. The chess board can be disassembled and storage away in zip-loc bags or boxes.



Build it and show it!

Did you make this project? Tell us by sharing it on the [Adafruit forums](#) and the [Thingiverse](#) page. We'll feature it on our blog, social networks and videos!