

Circuit Basics

6.S188 IAP 2026

This is just a quick little intro about how to build circuits for 6.S188 this IAP. This is a really quick intro with probably less information than you need if you're seeing this stuff for the first time, so if things aren't making sense, no worries, that's probably on us; if you need help with anything, come and talk to us (or your peers) in the lab, and we're happy to help.

Breadboards

We'll be hooking up our circuits using [breadboards](#), which is an electrical prototyping device that contains rows of springs intended for holding component leads. Each little hole is labeled with a letter and a number, and particular groups of these holes are connected together underneath by conductors. As a result, the breadboard allows us to conveniently attach circuit components together and quickly generate circuits. For example, anything that we put in row 10 column "A" will also be connected to the other pieces in row 10 columns "B", "C", "D", and "E" automatically by the breadboard, so if we want to connect components together, we can plug them into the same row and we're good (the little holes are grippy and so if you jam a wire in there, it'll stay in place and make an electrical connection).

The front and inside of a breadboard is shown below to give more of a sense of what little holes are connected to each other. Do NOT remove your breadboard back like we did below. We dirtied our hands so you don't have to.

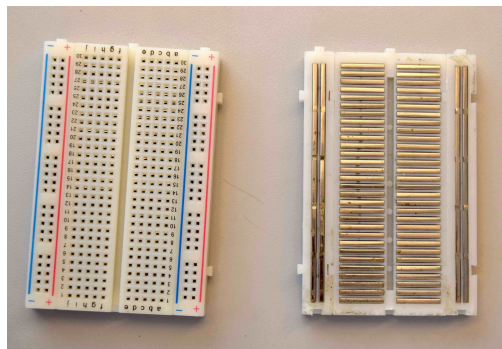


Figure 1: A Torn-apart breadboard

Power

We'll power our circuits using these little USB breakout boards. If you plug a USB-C cable in (and plug the other side into your computer or a wall adapter or something), then we can use the pin labeled **GND** as our ground (reference voltage), and the pin labeled **VBUS** will be at +5Volts relative to that reference point. So every time you see a schematic with a "5V" label, that should be hooked up to **VBUS**. And the little upside-down Christmas tree ground symbol should be hooked up to **GND**.

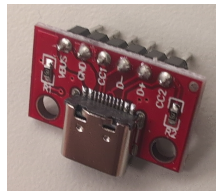


Figure 2: USB-C Breakout Board