

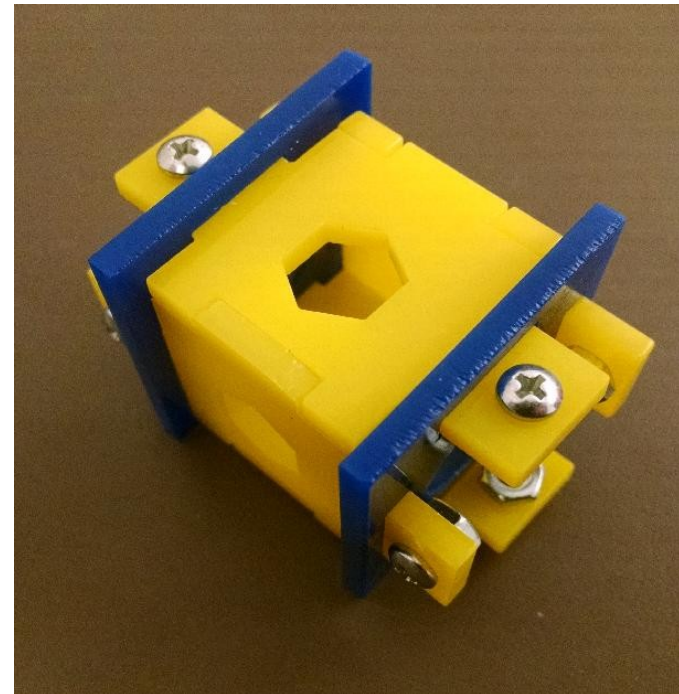
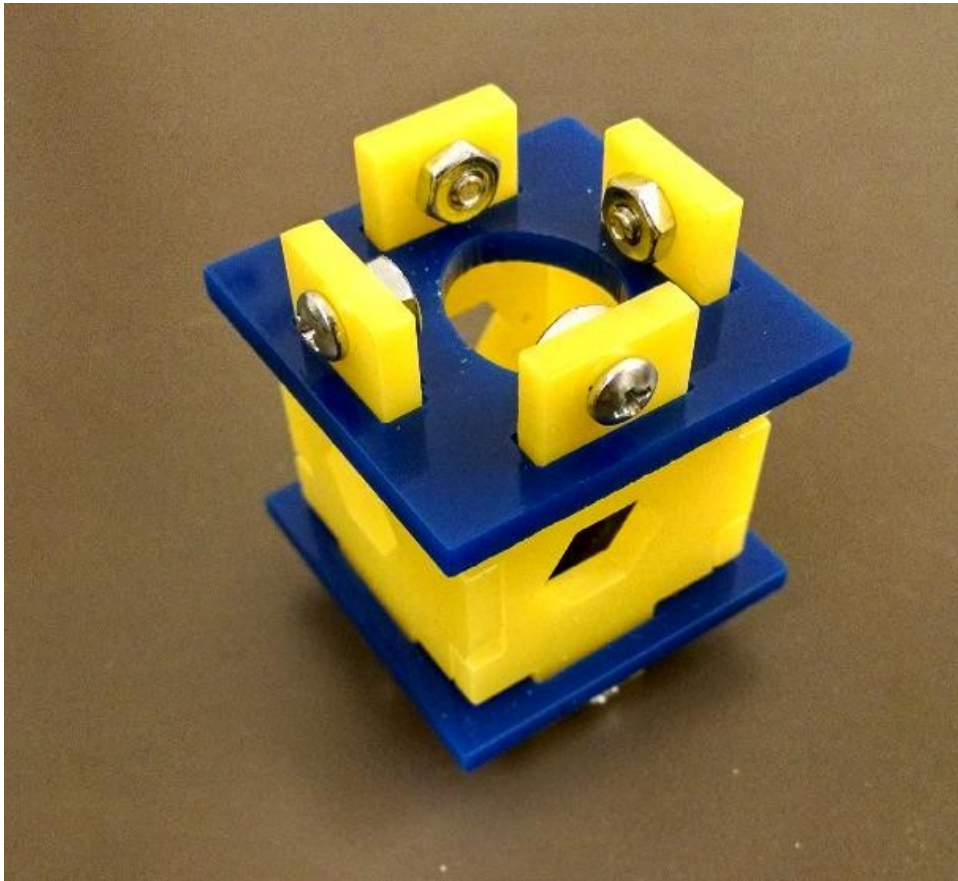
15-294 Rapid Prototyping Technologies:

Construction Tricks

Dave Touretzky
Computer Science
Carnegie Mellon University

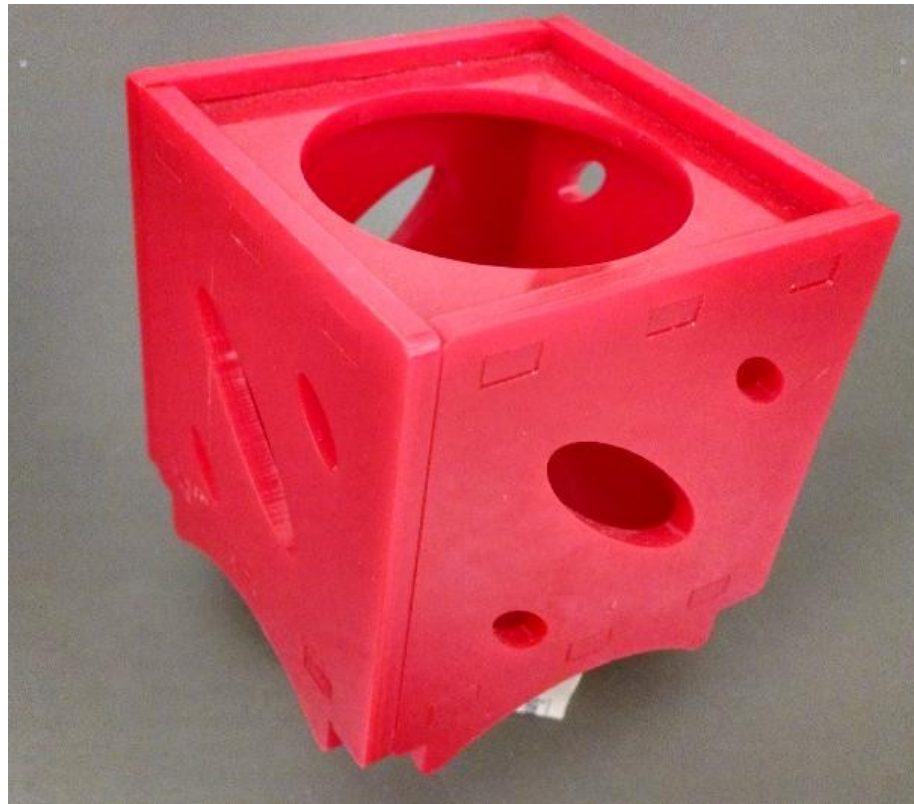
Making a Box

- Tab and slot construction
- Fasteners through the tabs



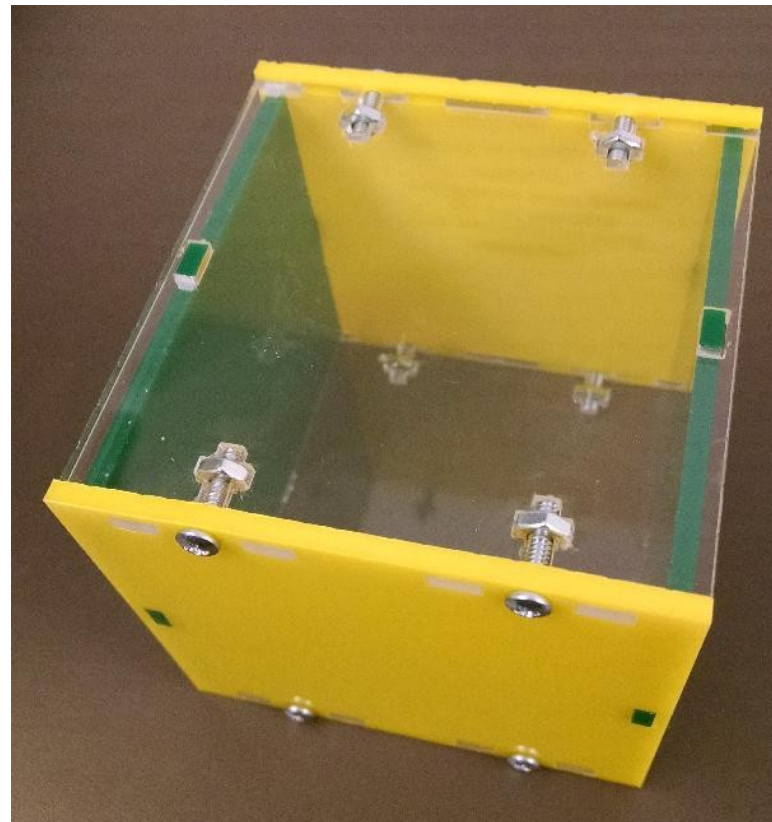
Making a Flush Box

- Tabs are flush with the slots
- Fastened with acrylic cement



T-Slot Joints

- Nut embedded in the panel
- Panels held under tension



T-Slot Pattern

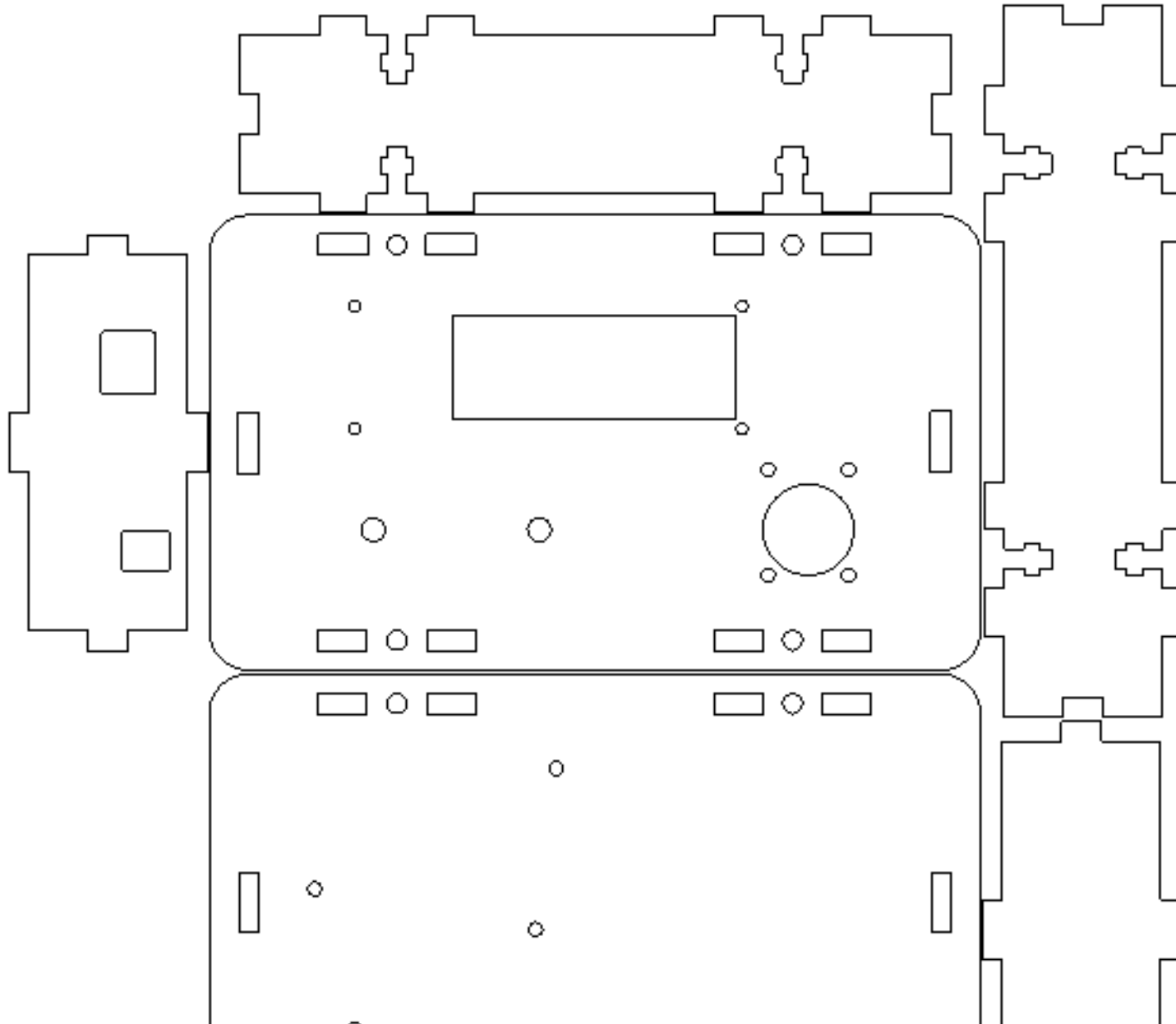


Image from Xiaoyang Kao
xy-kao.com

T-Slot in Wood



Image from Xiaoyang Kao
xy-kao.com

Flash Forge T-Slots



Dragon's Claw Joints

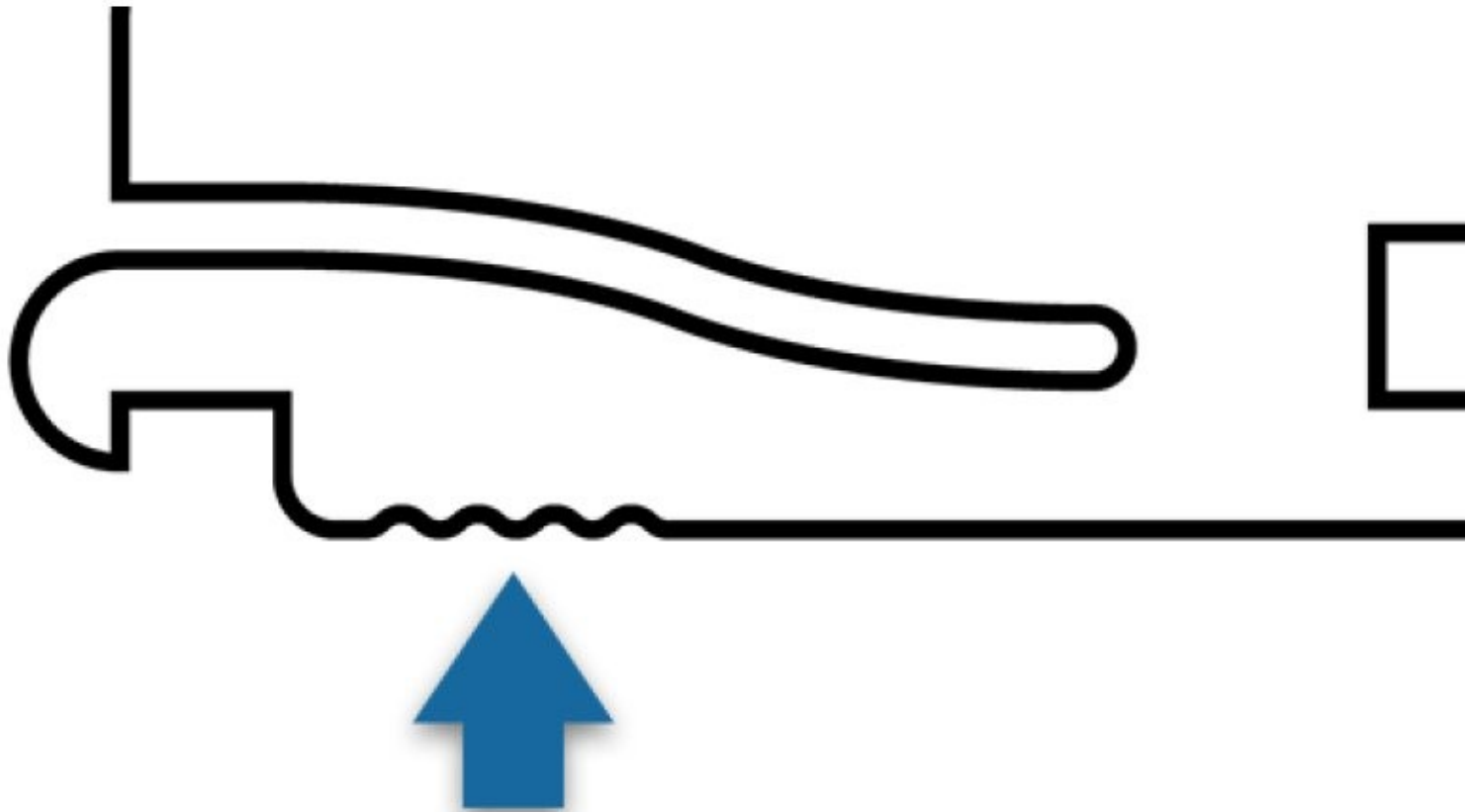


Image from Phil Burgess, Adafruit Industries.

Dragon's Claw

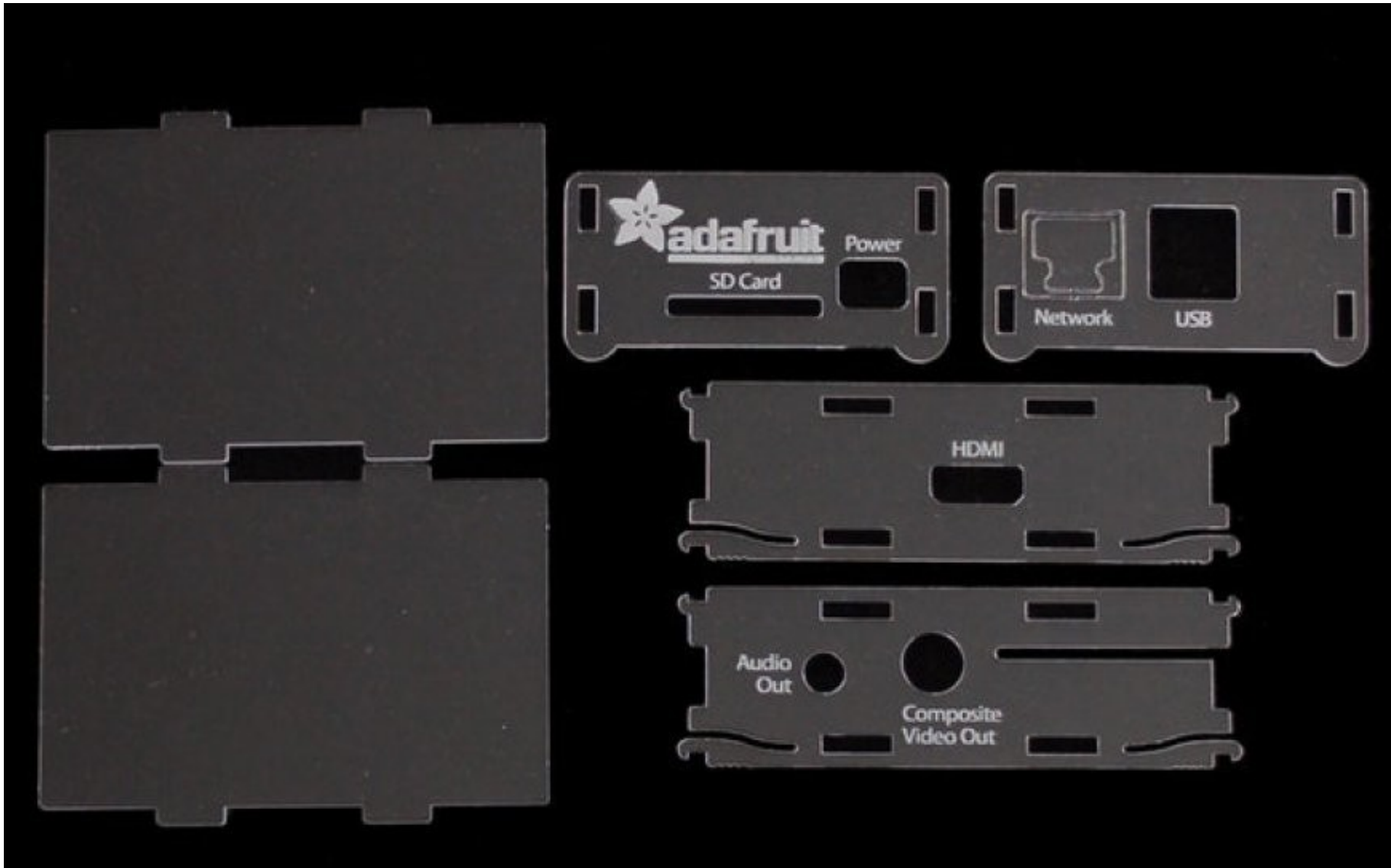


Image from Phil Burgess, Adafruit Industries.

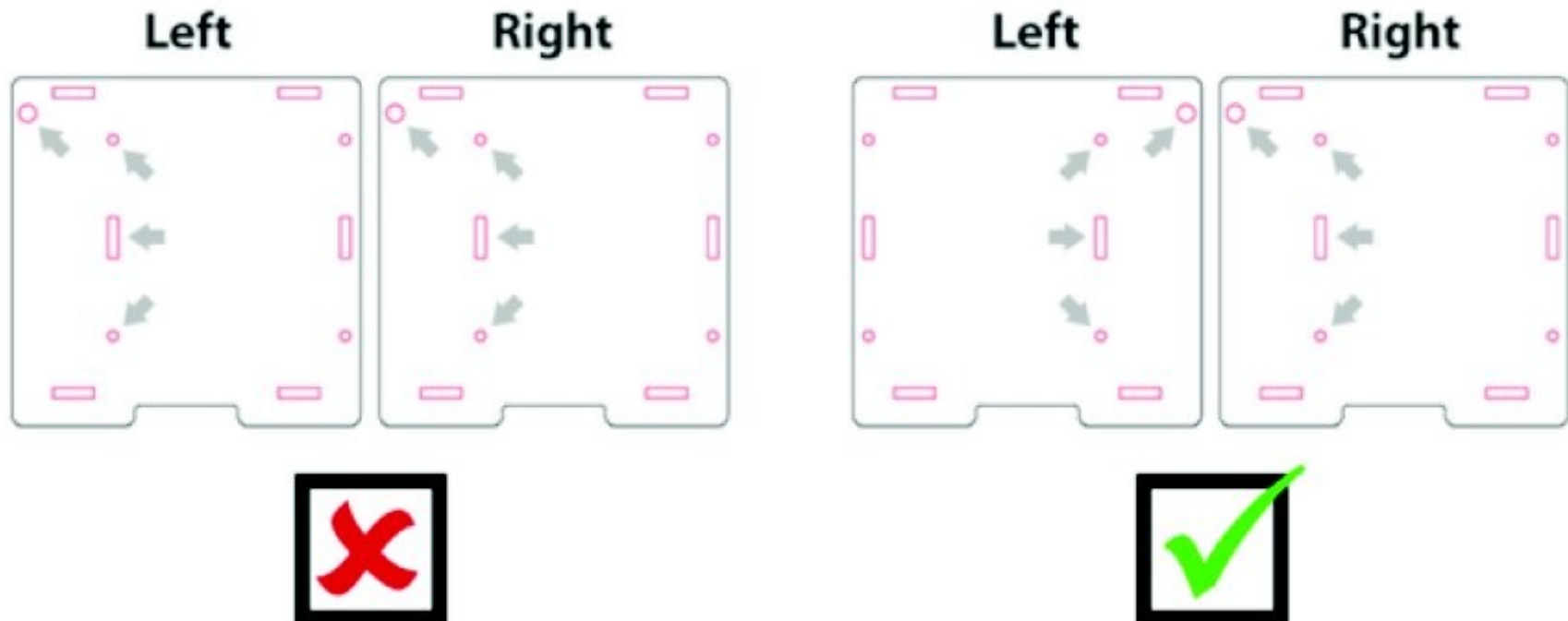
Dragon's Claw



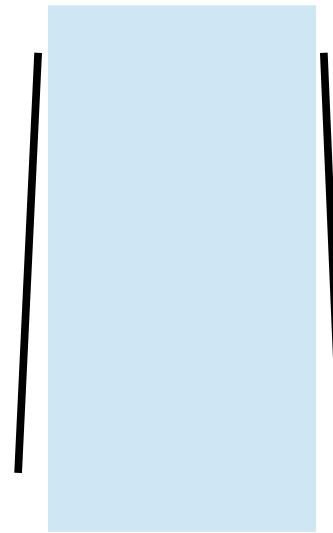
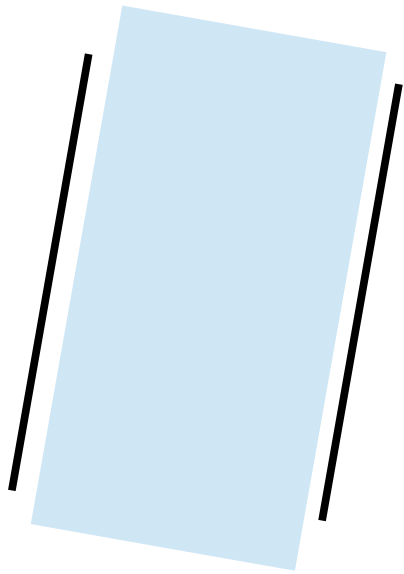
Image from Phil Burgess, Adafruit Industries.

Mirror Matching Parts Instead of Copying Them

Compensates for laser cutter asymmetries:
beveled edges due to depth of cut.



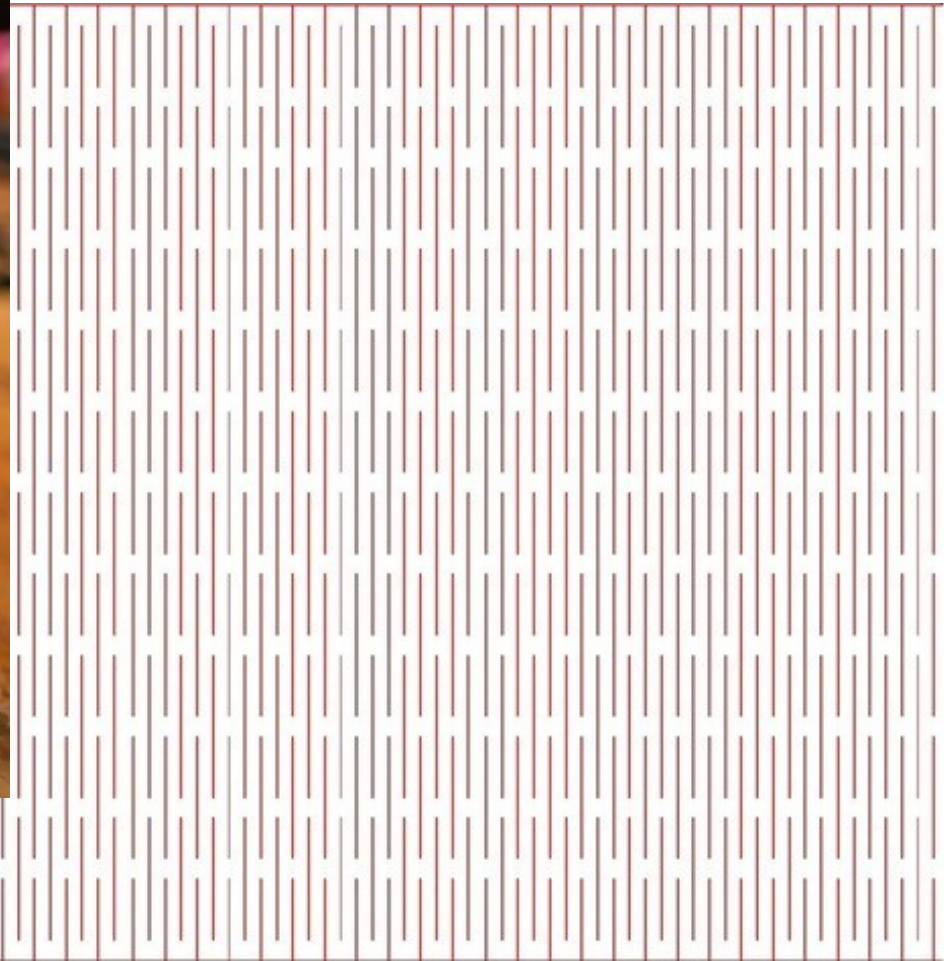
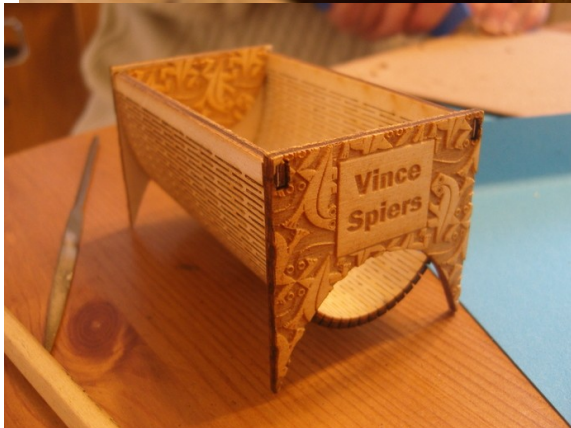
Mirror to Counteract Skew



Depressions in Laser Cut Parts

- You can use the laser cutter's “engrave mode” to erode the surface of a sheet, making a precise depression that another part can fit into.
- Adjust speed and power to control the depth of the depression. Might need multiple passes.

“Living Hinge” in Wood

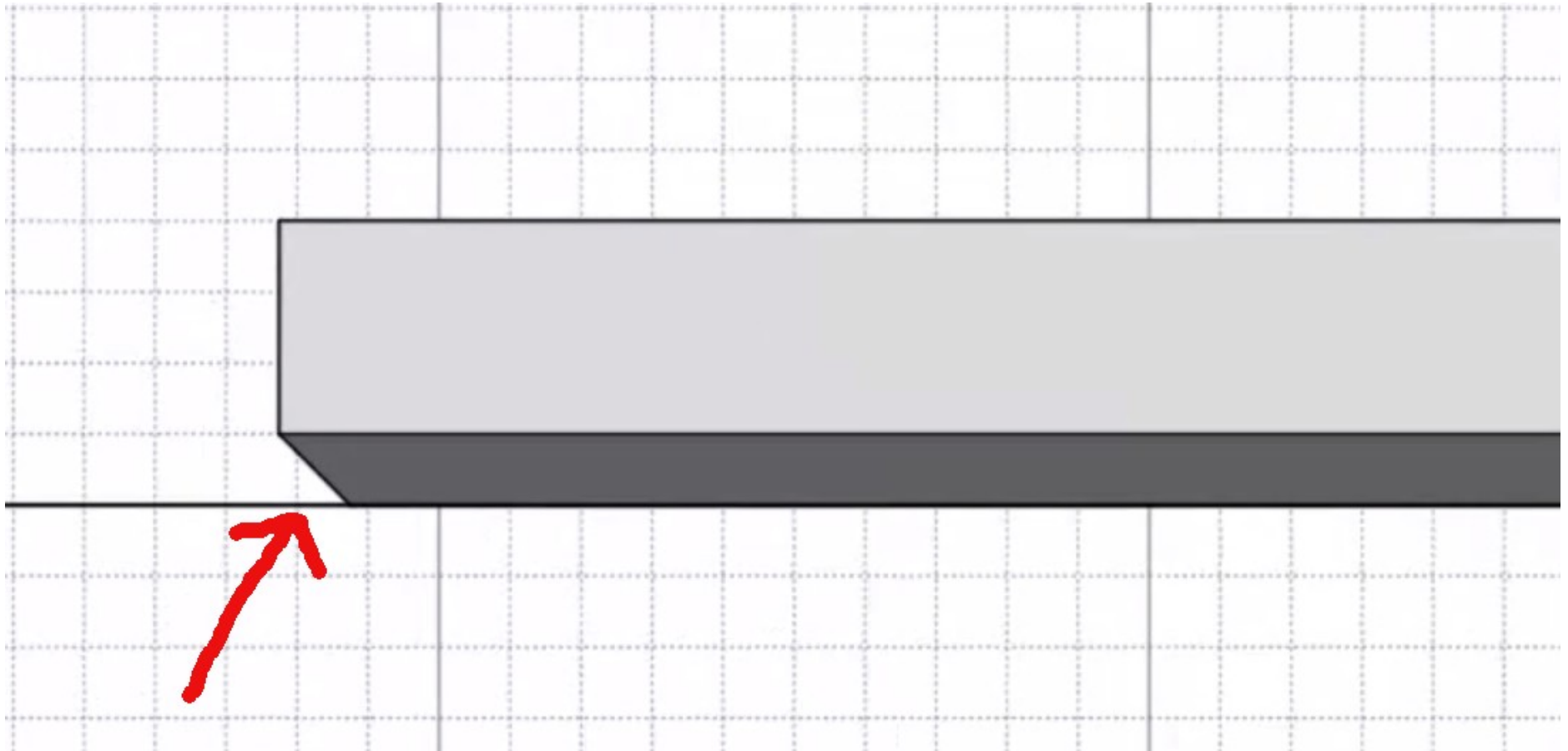


Bending Plastic

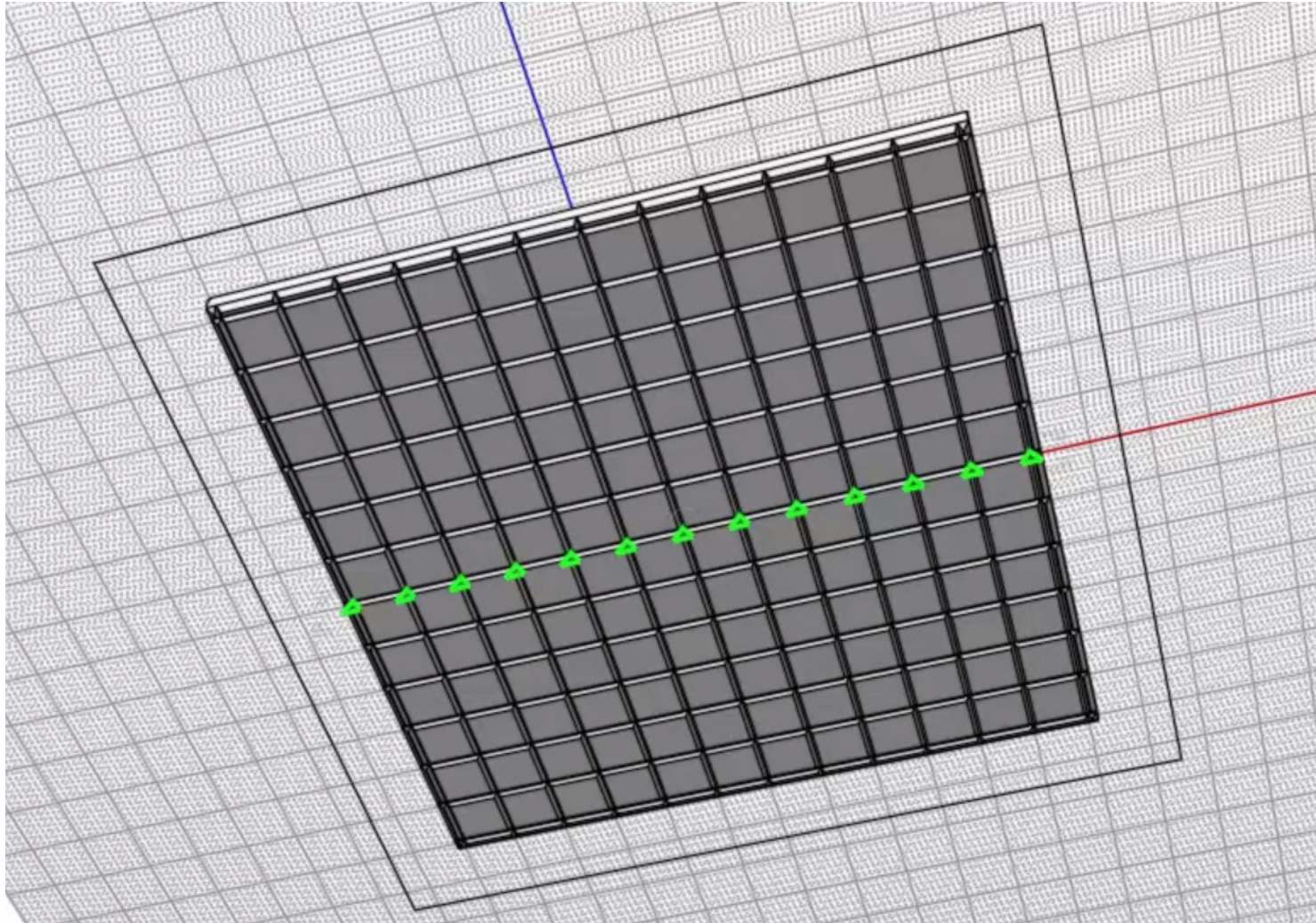
- You can bend plastic by hanging it over an edge and using the de-focused laser beam to melt it. (Idea from Dan Goncharov.)

3D Printing Tricks

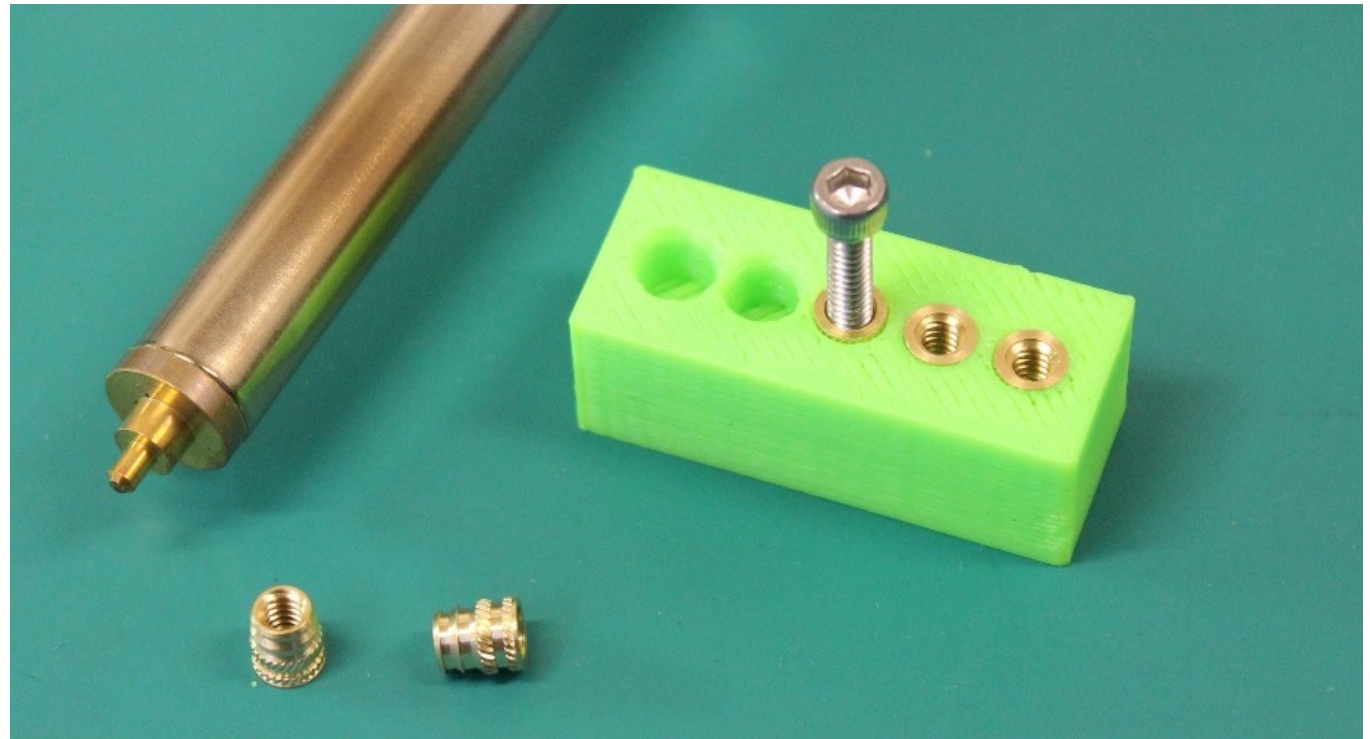
Chamfered Edges Aid Part Removal



Channels Make It Easier to Remove Flat Objects From the Print Plate



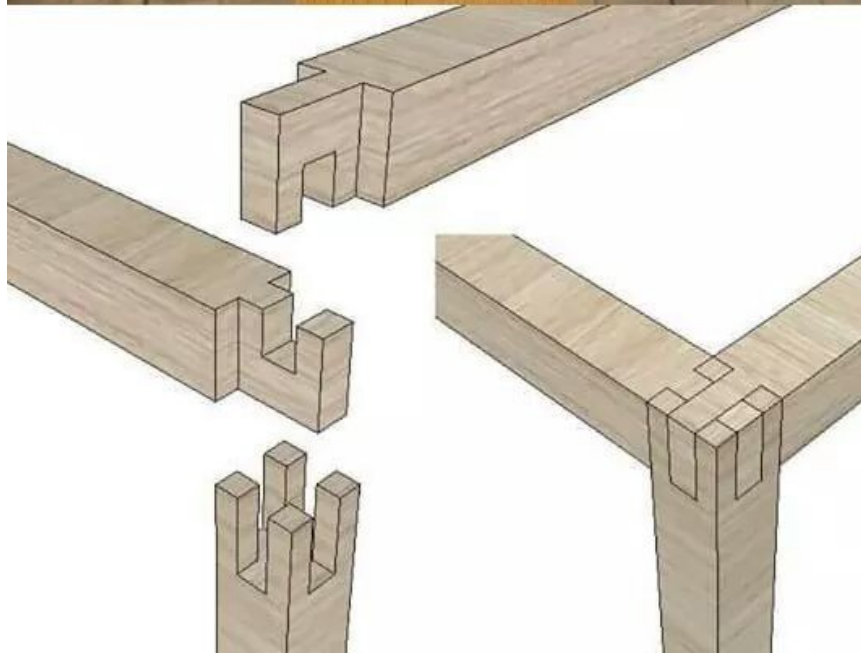
Threaded Inserts for Plastic Parts



Surface Smoothing of ABS

- Acetone vapor bath dissolves ABS plastic, creating a smooth finish.
- Wiping with MEK (methyl-ethyl ketone) can also work.
- Use caution when working with these solvents.

3D Joins



Articulated Figures



Test figurine from PieceMaker, Inc.