# Solar Charging Handbag

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https://learn.adafruit.com/solar-charging-handbag

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# Overview

Welcome to the summer of solar! Why not soak up some free power from the sun? Charge your gadgets on the go by making your own solar battery charger, then affix it to your favorite handbag or backpack. This is a fun soldering project you can build in an afternoon!

When you're out in the sun (or as long as your bag is), the battery charges up. You can simultaneously charge your phone when the sun is bright, and the battery will keep supplying juice long after the sun goes down.

We've upgraded this project to use the newer PowerBoost 500 Basic and a 3D printed enclosure, check it out! ()

Before you begin, read through the following guides:

- USB, DC & Solar Lipoly Charger ()
- MintyBoost ()


## Tools & Supplies

Bill of materials:

- USB/DC/Solar Lithium Ion/Polymer charger kit (http://adafru.it/390)
- MintyBoost kit (http://adafru.it/14)
- Altoids mints sized tin (http://adafru.it/97)
- A large solar panel (http://adafru.it/500) or a medium solar panel (http://adafru.it/200)
- A large lithium polymer battery (http://adafru.it/328) or a smaller one (http://adafru.it/258)
- 2.1mm DC Barrel Plug (http://adafru.it/1329)
- Double sided tape
- Adhesive Velcro tape
- A sturdy handbag or backpack

Any entry level 'all-in-one' soldering iron that you might find at your local hardware store should work. As with most things in life, you get what you pay for.
Upgrading to a higher end soldering iron setup, like the Hakko FX-888 that we stock in our store (http://adafru.it/180), will make soldering fun and easy.

Do not use a "ColdHeat" soldering iron! They are not suitable for delicate electronics work and can damage the Flora (see here ()).

Click here to buy our entry level adjustable 30W 110V soldering iron. (http://adafru.it/180)

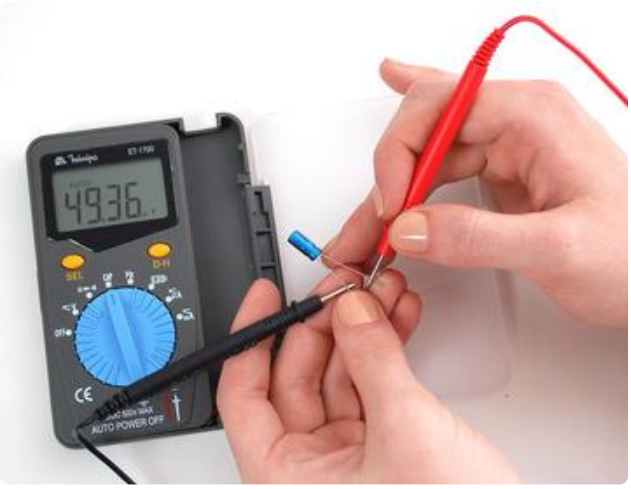
Click here to upgrade to a Genuine Hakko FX-888 adjustable temperature soldering iron. (http://adafru.it/303)

Learn how to solder with tons of tutorials! ()


You will want rosin core, 60/40 solder. Good solder is a good thing. Bad solder leads to bridging and cold solder joints which can be tough to find.

Click here to buy a spool of leaded solder (recommended for beginners). (http://adafru.it/145)

Click here to buy a spool of lead-free solder. (http://adafru.it/734)



You will need a good quality basic multimeter that can measure voltage and continuity.

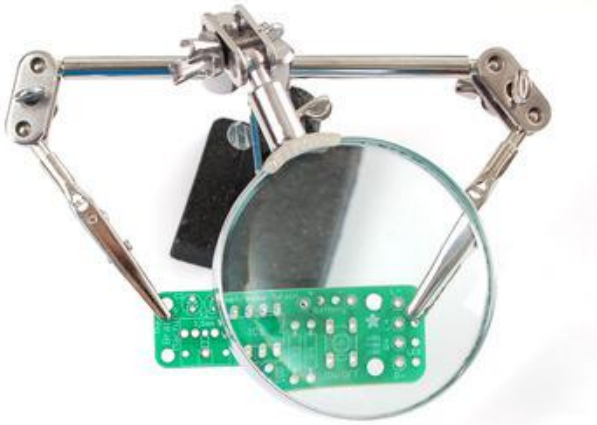
Click here to buy a basic multimeter. (http://adafru.it/71)

Click here to buy a top of the line multimeter. (http://adafru.it/308)

Click here to buy a pocket multimeter. (http://adafru.it/850)

Don't forget to learn how to use your multimeter too! ()

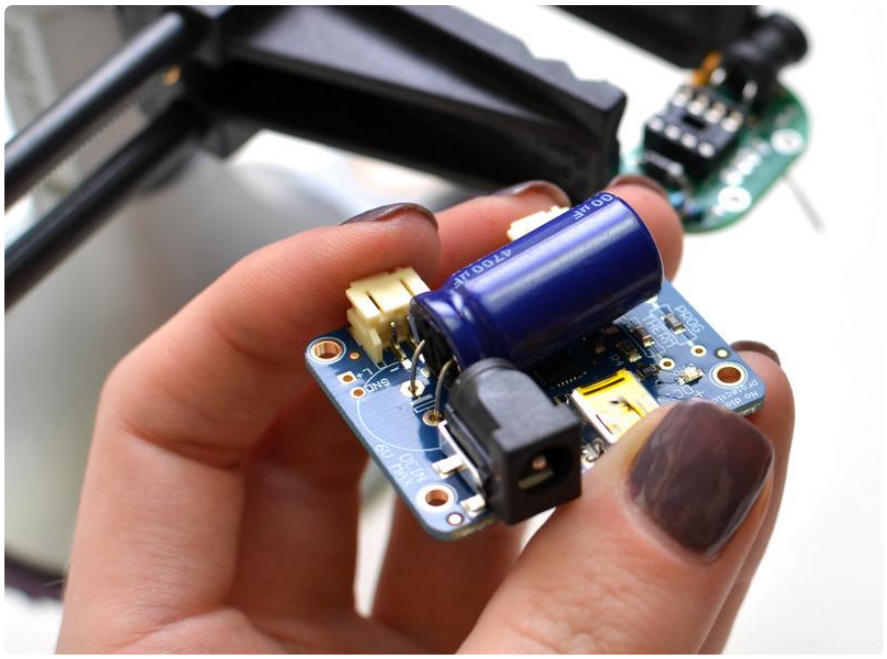
A PanaVise (http://adafru.it/151) is handy for assembling kits, but not strictly required.



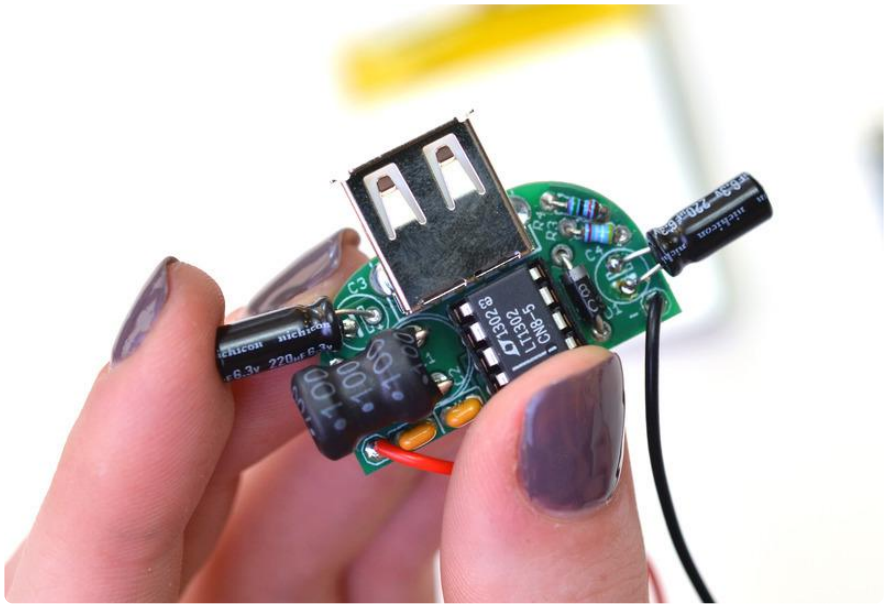
A third hand tool (http://adafru.it/291) makes soldering wires a breeze.


Don't forget your wire strippers (http://adafru.it/527), pliers (http://adafru.it/146), and flush snips (http://adafru.it/152)!

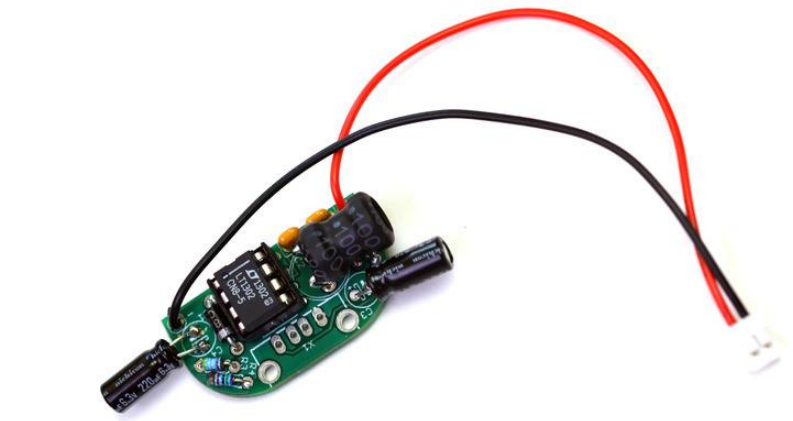
# Assemble Kits



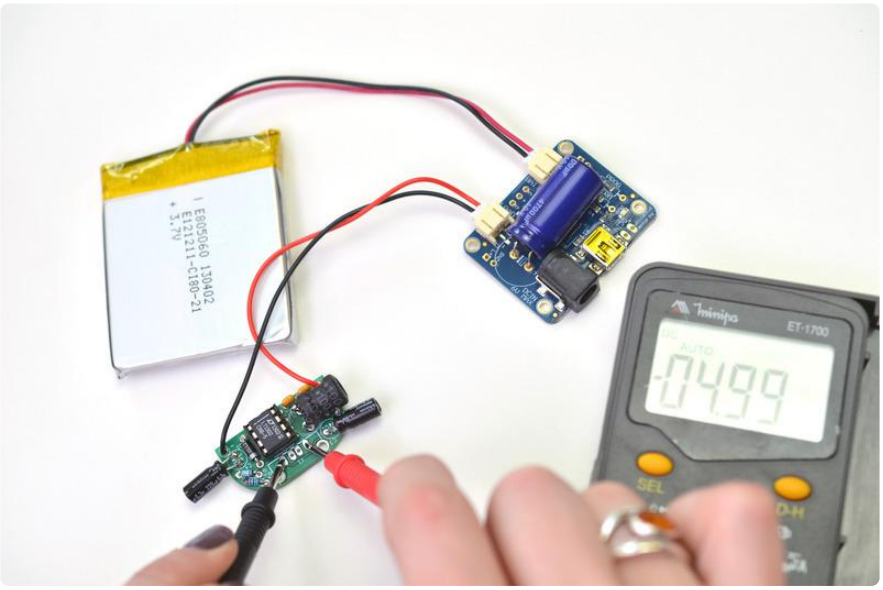
Follow the instructions in the Solar LiPoly Charger Guide (), but when it comes time to solder in the capacitor, bend it over so it lays down on the board first. This will help it fit better with everything else inside the enclosure.



Assemble the MintyBoost as instructed (), but lay down the tall capacitors and boost converter before soldering.



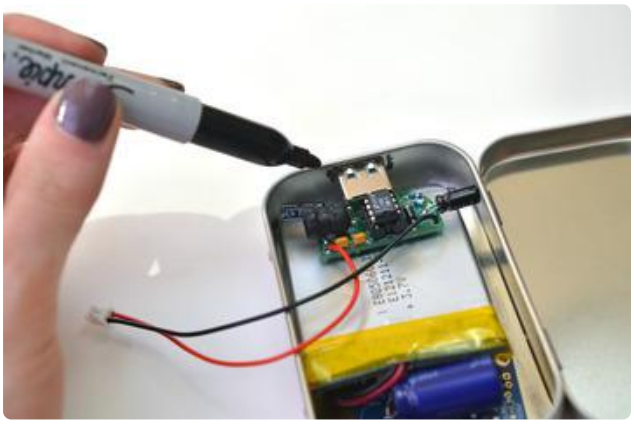
Instead of soldering on the MintyBoost's battery holder, solder on the JST cable that comes with the solar lipoly charger kit (red to + and black to -).



Plug the MintyBoost into the LOAD port on the solar charger, and plug a lithium polymer battery into the BATT port. Test that your MintyBoost is putting out 5 volts, then unplug the MintyBoost and solder on the USB jack as instructed.

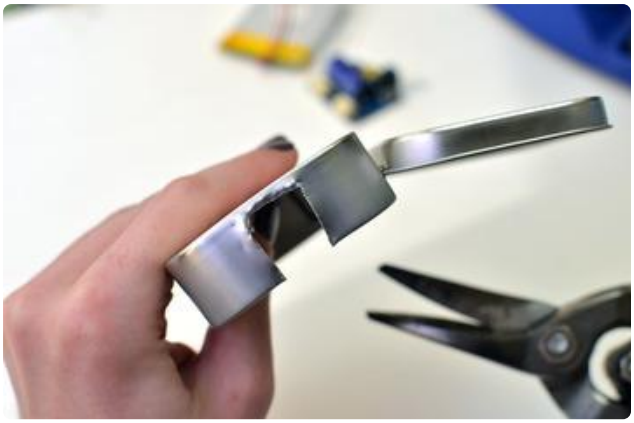
The solar charger has an output as high as 6V, this is a little higher than the Mintyboost is designed for but will work. The output voltage to the USB may end up at 6V. If you want to keep the Voltage out at a 'strict' 5V, connect the mintyboost to BATT not LOAD from the charger.

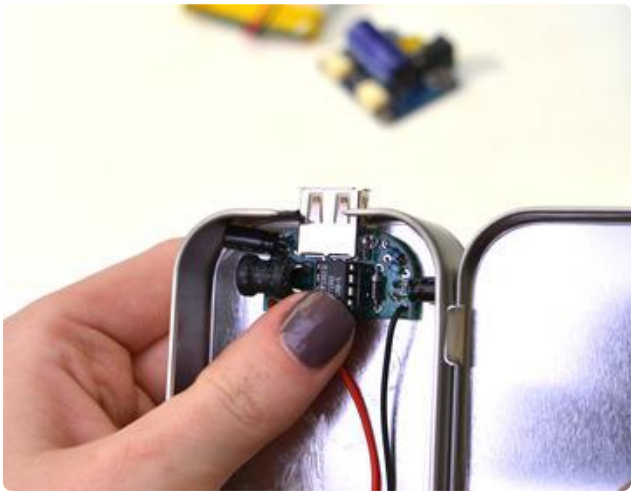
# Mint Tin Enclosure



Line the bottom of the mint tin with tape to insulate it from the metal contacts on your circuit board. Also wrap the battery in tape.

With your kits unplugged, place them facing opposite short edges of the tin and mark where the ports need access.



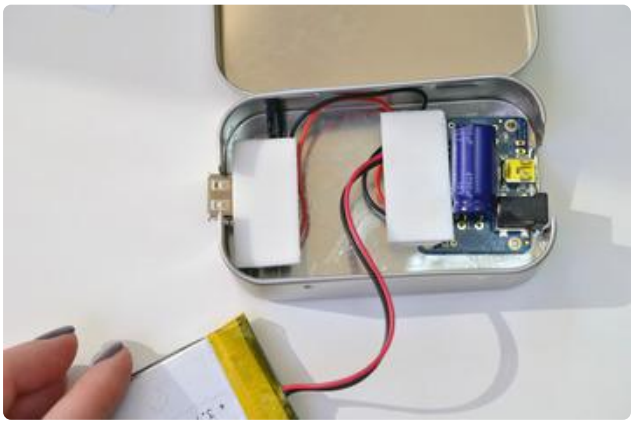


Snip out small rectangles from the short edges where you marked in the previous step. Curl the edges with pliers if you want it a bit smoother.

"Dry fit" the unplugged kits to see that they fit in the slots you snipped.

Use the double sided foam tape that came with the MintyBoost kit to secure it to the inside of the mint tin.

Use more foam tape or regular double-stick tape to secure the solar charging circuit, and plug the MintyBoost's JST cable into the LOAD port on the charging board.



Plug the battery in to the BATT port on the charging board, and use more double stick tape to secure the battery on top of the MintyBoost.

Remember that we earlier lined the tin with tape and wrapped the battery in tape as well!

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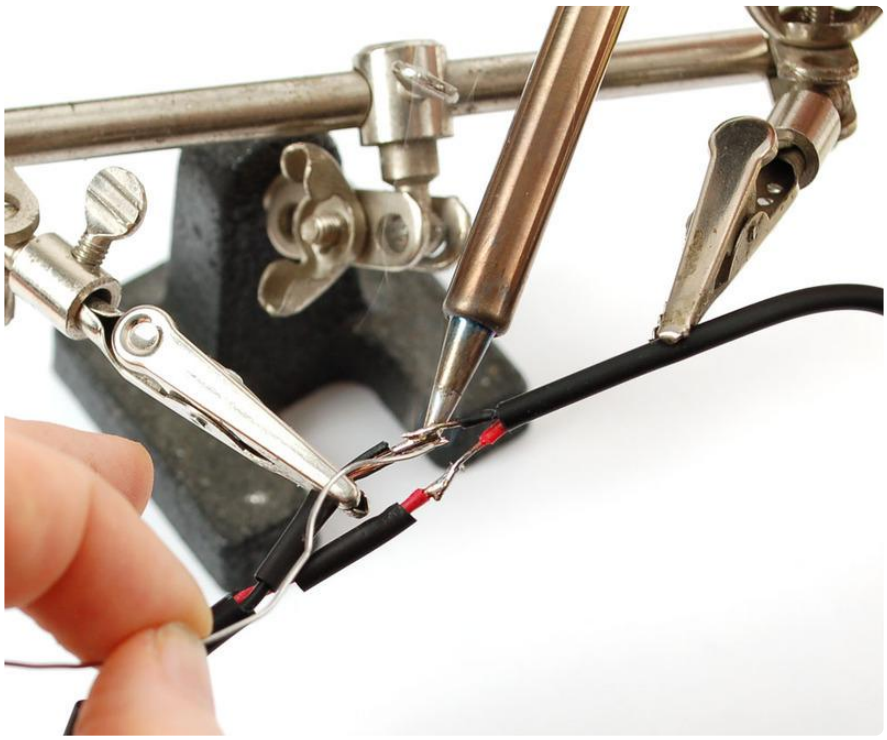
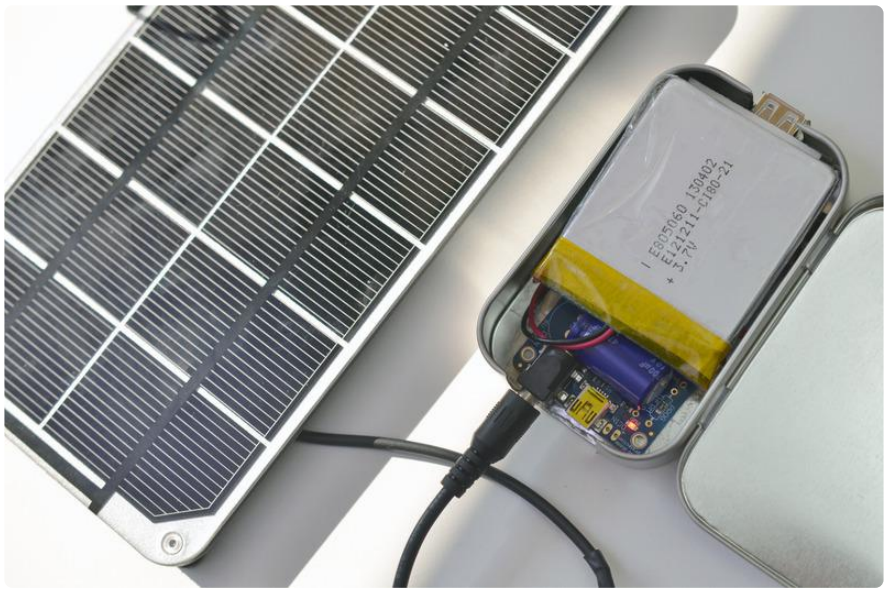
# Prepare Solar Panel



Follow Method 2 for replacing your solar panel's barrel jack () on the appropriate page of the LiPoly Charger Guide: first slide on a large piece of heat shrink tubing, two

smaller pieces (one on each wire). Tin the stripped wire leads and solder them together (red to red and black to black). Shrink the little heat shrink tubing pieces over the joints, then shrink the larger piece over the entire section for a finished look and added stability.



Test your circuit by plugging in the solar panel, then placing it in direct sunlight. The red charging light should be bright and solid, not flashing. To learn more about the charger, check out the LiPoly Charger Guide (). you can also charge your battery using the mini USB jack.


Plug your phone into the MintyBoost's USB port and see it charge up!

# Wear it!

Use two pieces of adhesive Velcro tape to secure the solar panel to your bag. Stick the fuzzy side to your bag neatly and aligned with the size of your solar panel, then mate the scratchy hook side of the Velcro to the fuzzy side, peel off the adhesive back and gently press on your solar panel. Then squish the glue joints before carefully separating the newly affixed Velcro pieces. If necessary, stitch or staple the fuzzy side of the Velcro to your bag.

We also had good luck affixing the solar panel (more permanently) with the four mounting screws at the corners. Unscrew the caps and make four holes in your bag with an awl. Line it up and screw the caps back on once the screw is through the fabric, holding it in place.

Get charging! Take this project camping, to the beach, or anywhere else you need backup power.