How to Keep a Clean Breadboard

Problems with messy wires:

- They can pick up unwanted noise.
    - Especially when dealing with low amplitude (physiological) signals.
- They make it more difficult to troubleshoot circuits because it is not as easy to see where wires are going (See Figure 1).
- They look untidy or disorganized.

Although it may seem like a waste of time, in the long run, it is well worth it to keep your breadboard clean.

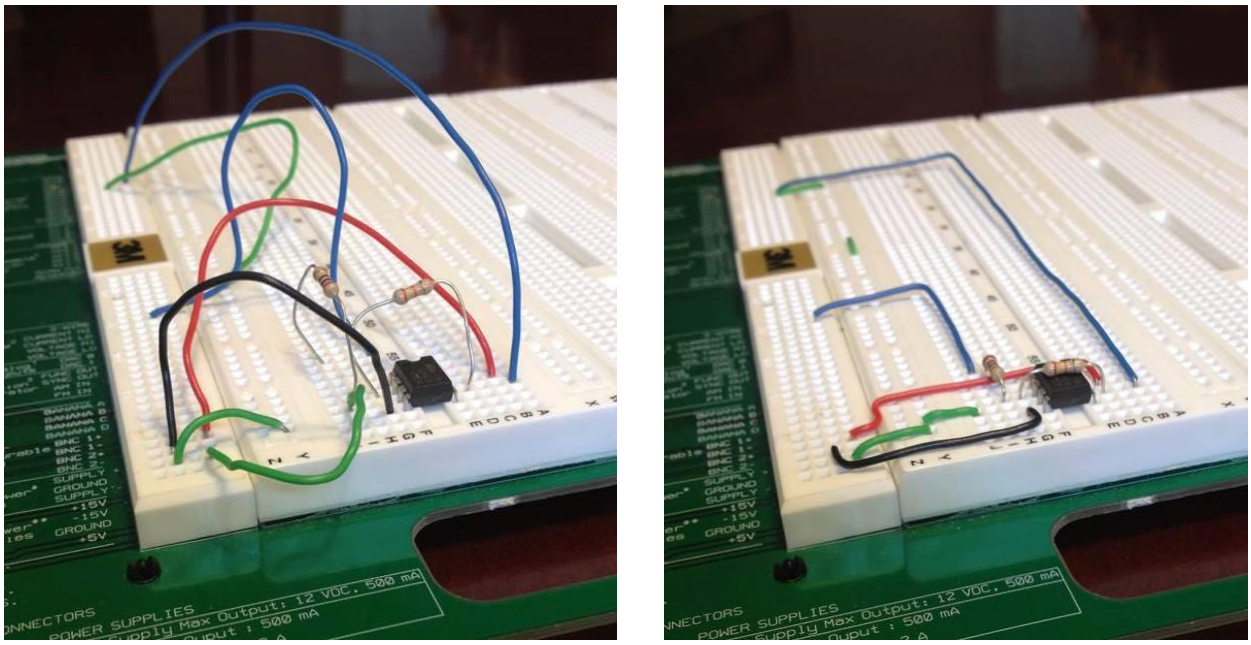


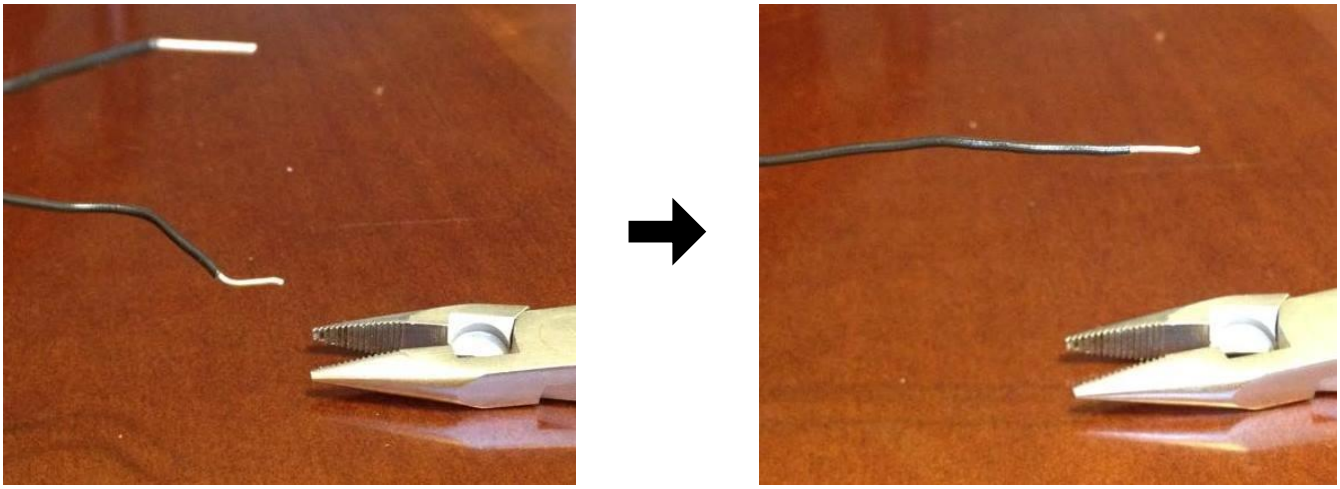
***Figure 1**. Before and after cleaning up a breadboard.*
In this tutorial, we will go through the clean-up process with the black wire

Tip: It is okay to have extra slack in your wires when you first start working on your project. This allows you to easily rearrange components when you are still building your circuit.

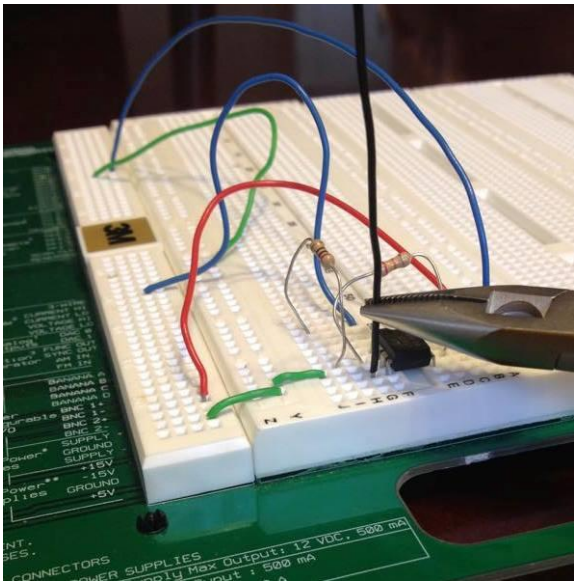
Steps:

1. Plan ahead.
    a. If you have a lot of crisscrossing wires, try to rearrange some of the connection points so it will be easier to lay everything flat.
    b. Start with shorter wires that don't have as much flexibility.
    c. In general, start near key components in the center and work outwards.

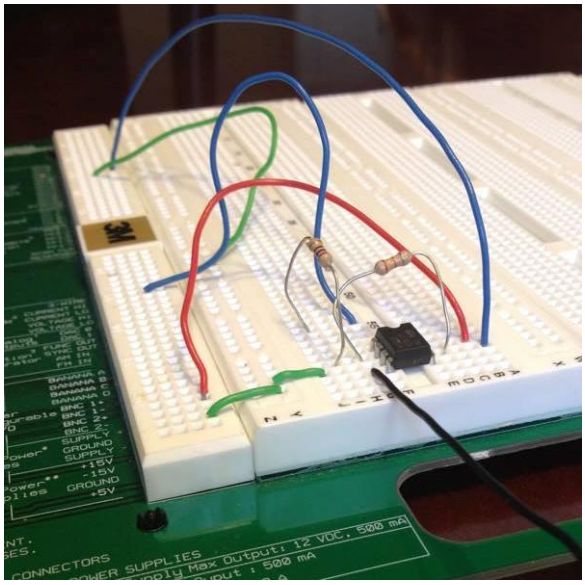
2. Remove the first wire (remember where it goes!) and use pliers to straighten it out.



3. Plug one end of the straightened wire into the harder to reach connection point.



4. Fold the wire over so that it is flat with the board and direct it so that it runs on top of the desired pin.



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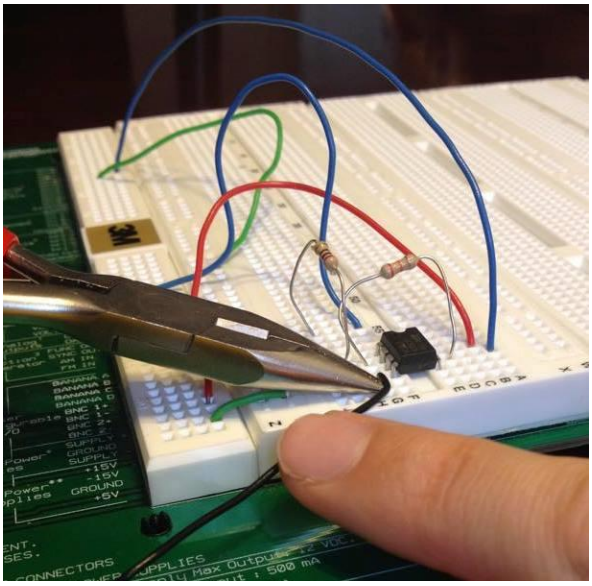
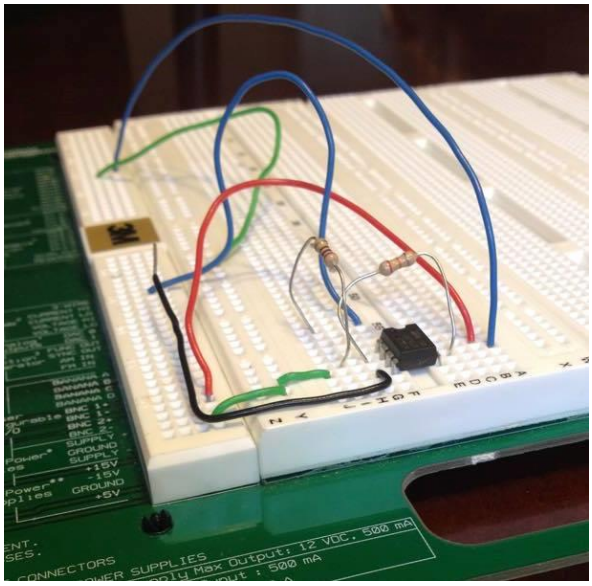
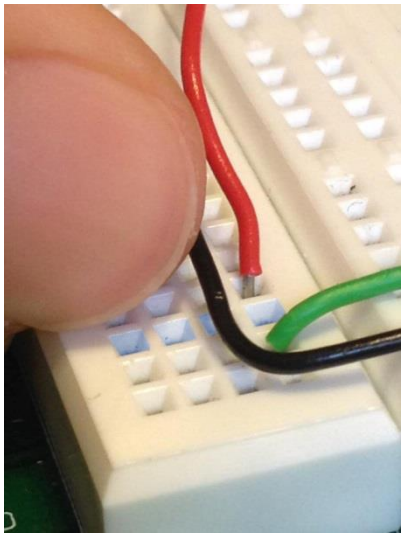
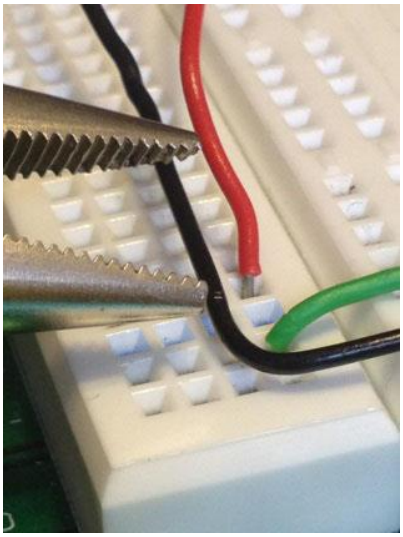
4a. If your desired path is not straight, simply bend the wire along the desired path (right angles are suggested).





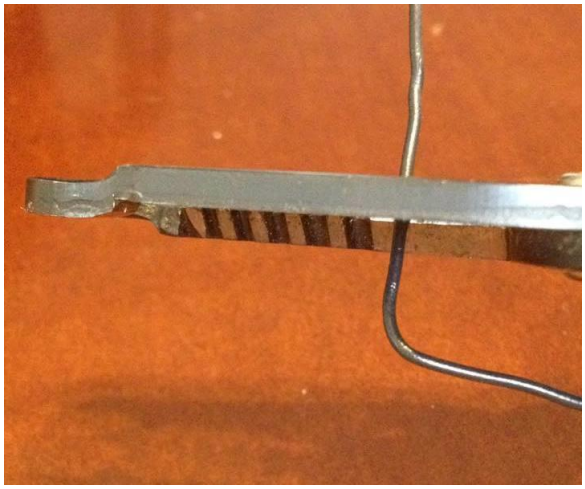
5. Nick the wire's plastic shell using your fingernail or pliers to mark the spot where you want it to plug in (in this case, the destination row is the one highlighted in light blue).

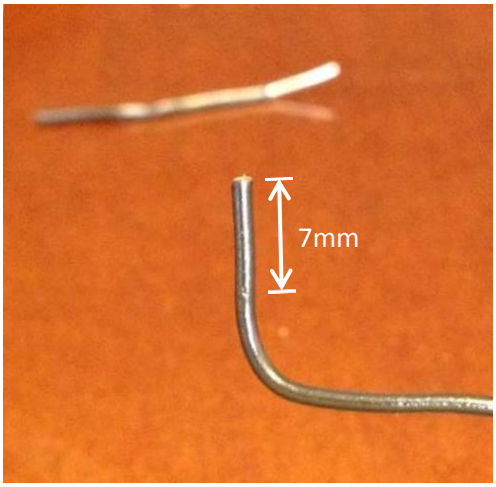




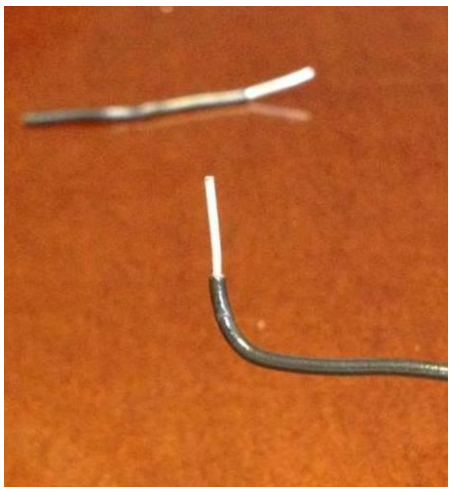
6. Pull the wire out of the board.

7. Cut the wire approximately 7mm past the mark you made. (For reference, an op amp shell measures 6 x 9 mm)





8. Strip the wire from the spot that you marked.



9. Bend the newly stripped section of wire to a 90 degree angle (matching the other bent end).

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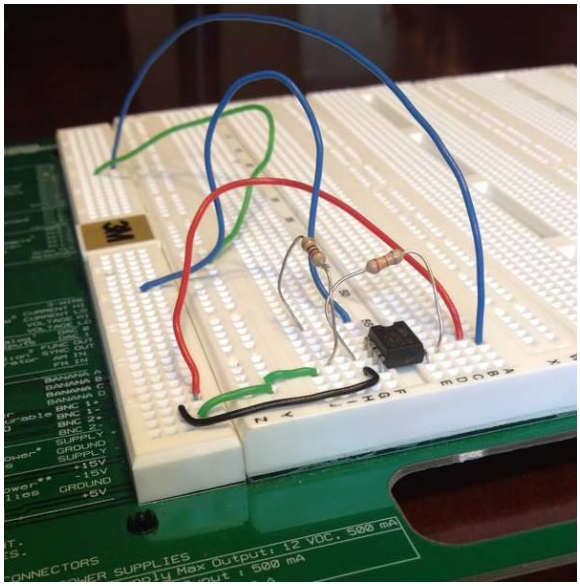
10. Plug the wire back into the breadboard. You did it!



11. Repeat until your board is a masterpiece!