

# PACE Electrical Engineering

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## Circuit Troubleshooting Tips

So, you've finished building your circuit and it doesn't work. What do you do? Try these tips in order.

- Make sure you in fact have a problem. Check the directions and verify that the circuit is not working the way it's supposed to

If you're sure the circuit is *not* working correctly, continue with these checks:

- Check that you have connected the circuit elements together correctly.
- Check for short circuits. Make sure elements that shouldn't be connected to each other aren't
- Check for open circuits. Look for elements or wires that are not fully pushed into the breadboard. Check for any other loose connections. Make sure that wires and leads that should be connected are in the same row of the breadboard
- Make sure that elements, such as diodes, LEDs, and polarized capacitors that must be wired in a particular direction are.
- Reread the directions to make sure you didn't miss something that may not be identified in the schematic (circuit diagram). For example, what should be done with unused IC pins?
- Verify that you have the right components. Check
  - resistor values
  - transistor types
  - capacitor values
  - chip types
- Make sure your batteries are fresh. Test their voltages using a voltmeter
- If all else fails, check for defective components
  - Swap out one component at a time with another of the same type and test the circuit with the new component
  - If you can test a component, you may do that instead of swapping it for another one