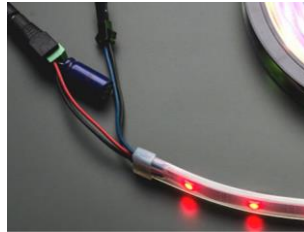


**Improper use can damage your NeoPixels. Before diving in, be aware of the following:**



- Before connecting NeoPixels to any power source, add a large **capacitor** (1000  $\mu$ F, 6.3V or higher) across the + and - terminals as shown above.
- Place a **300 to 500 Ohm resistor** between the Arduino data output pin and the input to the first NeoPixel. This resistor must be at the NeoPixel end of the wire to be effective! *Some products already incorporate this resistor...if you're not sure, add one...there's no harm in doubling up!*
- Try to **minimize the distance** between the Arduino and first pixel.
- **Avoid connecting NeoPixels to a live circuit.** If you simply *must*, always **connect ground first**, then +5V, then data. Disconnect in the reverse order.
- If powering the pixels with a separate supply, apply power to the pixels before applying power to the microcontroller.
- Observe the same precautions as you would for any **static-sensitive** part; ground yourself before handling, etc.
- NeoPixels powered by 5v **require** a 5V data signal. If using a 3.3V microcontroller you must use a logic level shifter such as a [74AHCT125](#) or [74HCT245](#). (If you are powering your NeoPixels with 3.7v like from a LiPoly, a 3.3v data signal is OK)
- Make sure that your connections are secure. Alligator clips do not make reliable connections to the tiny solder pads on NeoPixel rings. Better to solder a small pigtail wire to the ring and attach the alligator clips to that.

Some of our NeoPixel project guides fail to mention the above precautions...they were written before these lessons were learned, and will be updated as required. The design changes are usually minimal (e.g. add inline resistor on data pin in circuit diagrams).

Smaller, battery-operated projects (e.g. FLORA and sewables) are usually fine omitting the capacitor and/or the resistor, but more substantive projects incorporating NeoPixel rings, matrices or a meter or more of NeoPixel strip, or using a plug-in power supply should *definitely* include both!