Off Factor

Voltage

Ohm’s Law

- V = IxR
- V = Voltage
- I = Current measured in Amps
- R = Resistance measured in Ohms

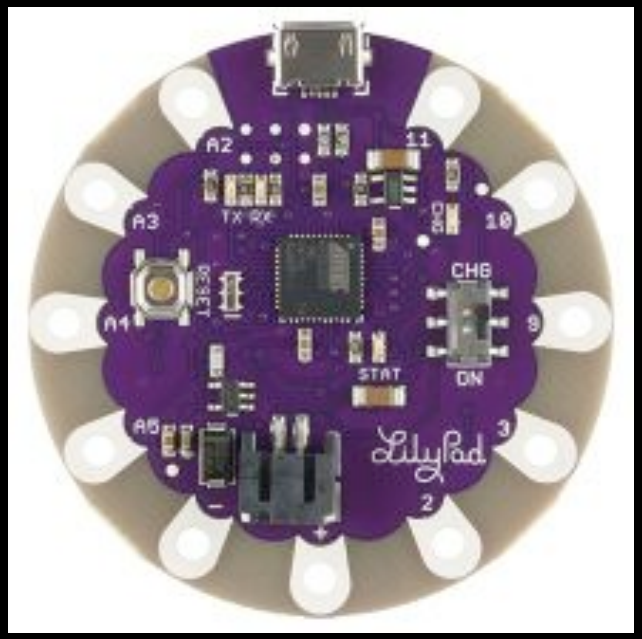
- Also R= V/I
- Also I = V/R

Voltage


Panasonic
CR 2025
3V
Made in Indonesia


E603450 7820
E7B0Z-D60-1
1000mAh 3.7V

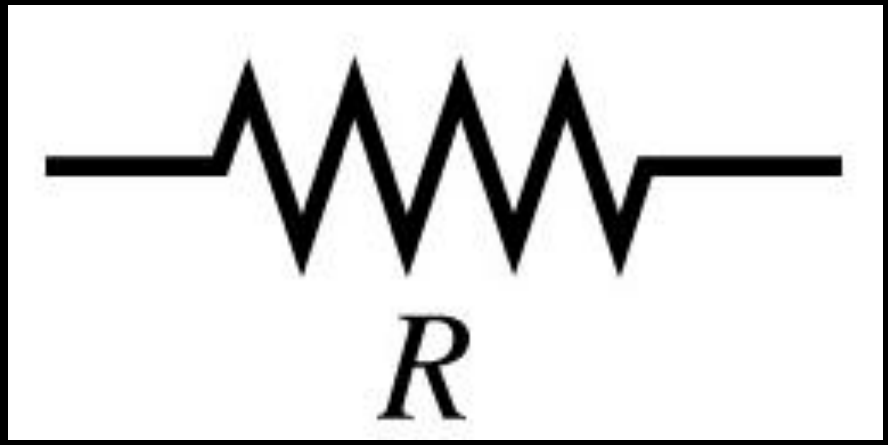
Your Magical Voltage Number = 3.3v



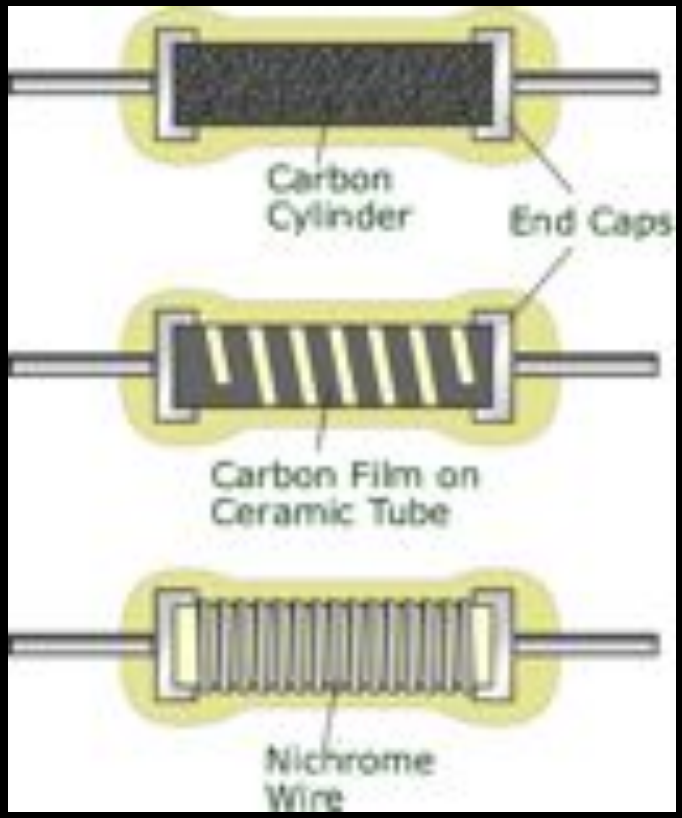
* Most sensors also run at 3.3v

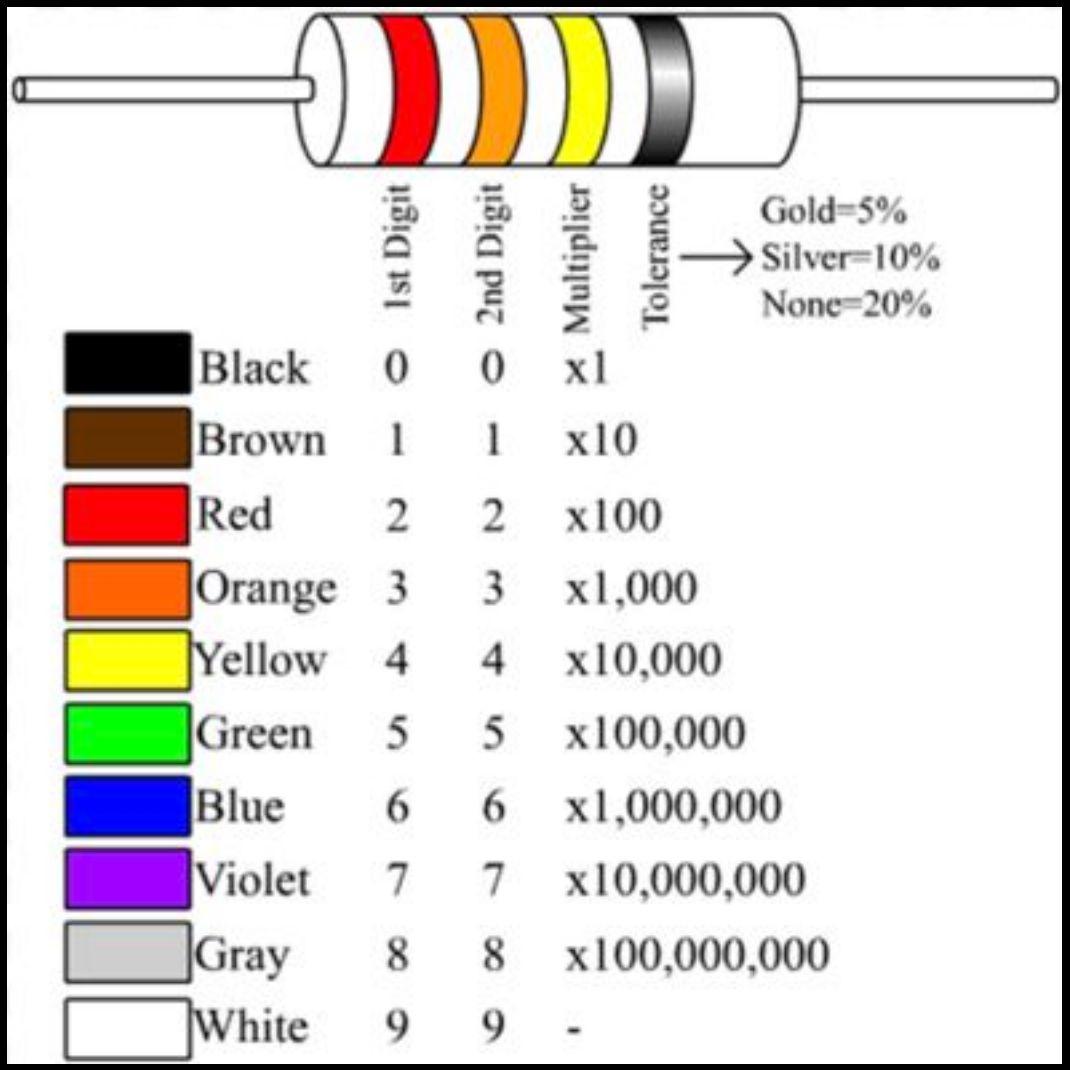
Don’t let out the magic smoke

Resistor



Resistor


Carbon
Cylinder
End Caps
Carbon Film on
Ceramic Tube
Nichrome
Wire


1st Digit
2nd Digit
Multiplier
Tolerance
Gold=5%
Silver=10%
None=20%
Black 0 0 x1
Brown 1 1 x10
Red 2 2 x100
Orange 3 3 x1,000
Yellow 4 4 x10,000
Green 5 5 x100,000
Blue 6 6 x1,000,000
Violet 7 7 x10,000,000
Gray 8 8 x100,000,000
White 9 9 -

Thread has resistance but not that much

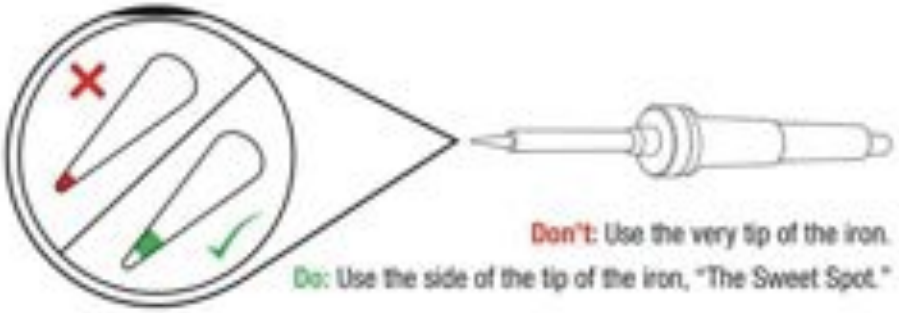
Resistance: 28 Ohms/ft

Voltage and Resistance are important for:

- Not blowing out your board or components
- Making all LEDs have the same brightness
- Battery life
- Sensors

Attaching

Soldering



Don't: Use the very tip of the iron.
Do: Use the side of the tip of the iron, "The Sweet Spot."

Do: Touch the iron to the component leg and metal ring at the same time.

Do: While continuing to hold the iron in contact with the leg and metal ring, feed solder into the joint.

Don't: Glob the solder straight onto the iron and try to apply the solder with the iron.

Do: Use a sponge to clean your iron whenever black oxidization builds up on the tip.

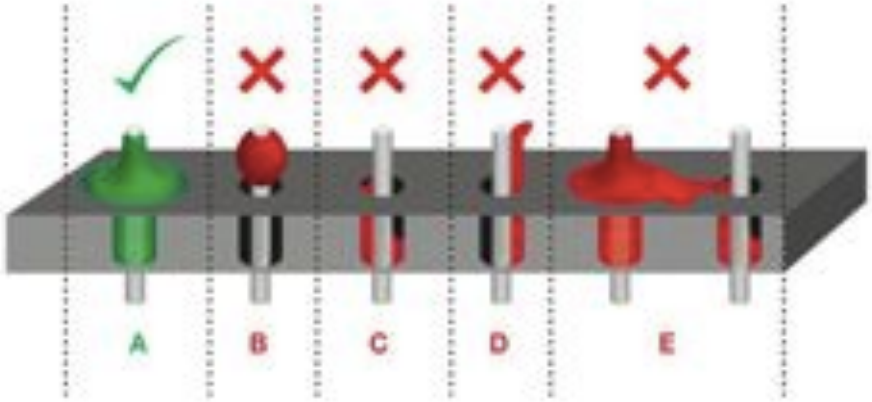
A Solder flows around the leg and fills the hole - forming a volcano-shaped mound of solder.

B Error: Solder balls up on the leg, not connecting the leg to the metal ring.
Solution: Add flux, then touch up with iron.

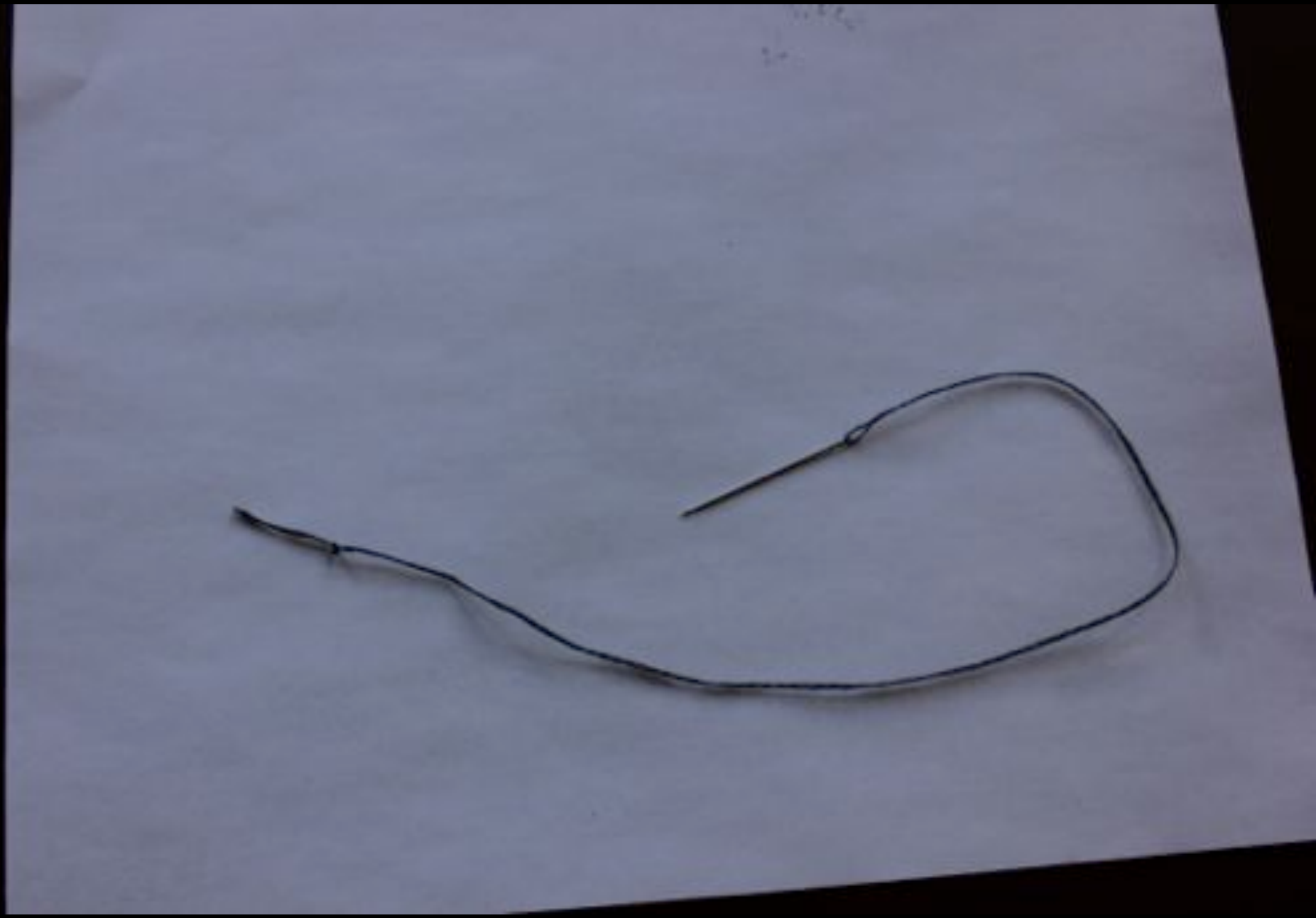
C Error: Bad Connection (i.e. it doesn't look like a volcano)
Solution: Flux then add solder.

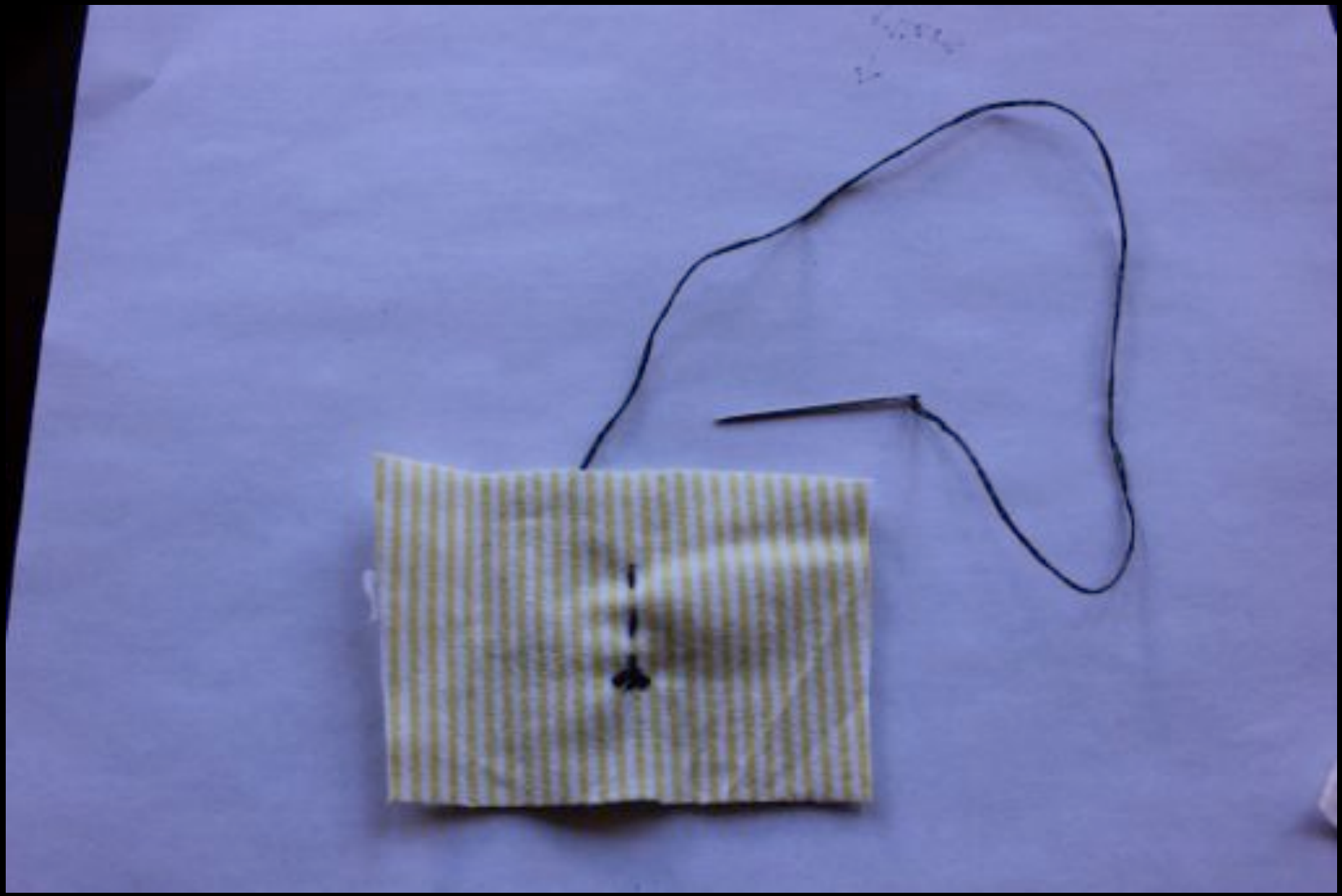
D Error: Bad Connection...and ugly...oh so ugly.
Solution: Flux then add solder.

E Error: Too much solder connecting adjacent legs (aka a solder jumper).
Solution: Wick off excess solder.



Sewing





Don’t cross your thread (or wire)!

Other methods – but remember your off value

- Hot glue – great insulator
- Snaps – are conductive!
- Iron on adhesive (just remember the adhesive itself may not be conductive)
- Velcro – excellent for larger items like battery packs – conductive Velcro exists
- Buttoneer – great for EL wire
- JST or Ethernet connectors
- Electrical tape – eventually falls off and gums things up (not recommended)