

# Safety rules & tips

Soldering can be a dangerous activity for children if done improperly.

- Leave enough space for the soldering iron and cables.
- Explain how to use a soldering iron and the dangers.
- Keep a cream against burns in case of small accidents.
- Ask kids to wear goggles when they cut the extra legs of electronic components.



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# Voodoo Dolls

An Introduction to Electronics and Sewing

## Materials & Tools

### Materials

- ▶ PCB Voodoo Lapins file
- ▶ Attiny45
- ▶ Pinheader 1x4
- ▶ Resistor 100 Ohm
- ▶ Resistor 10kOhm
- ▶ Battery holder
- ▶ LED 3mm (green, yellow or red)
- ▶ LED 5mm (green, yellow or red)
- ▶ 5 resistors 1% : 110 Ohm, 220 Ohm, 330 Ohm, 470 Ohm, 680 Ohm
- ▶ Wires
- ▶ Conductive fabric
- ▶ Thermocollant fabric
- ▶ Thin felt
- ▶ Thread
- ▶ Laser cutter
- ▶ Iron
- ▶ Sparkfun AVR programmer
- ▶ Soldering iron
- ▶ Solder
- ▶ Goggles
- ▶ Portable fume extractors
- ▶ Cutting pliers for electronics
- ▶ Needles

# Voodoo Dolls

## Step by step instructions

### Process overview

- ▶ Step 1 : Preparation
- ▶ Step 2 : Solder the components to the PCB
- ▶ Step 3 : Iron the conductive tissue and add resistors
- ▶ Step 4 : Sew and assemble
- ▶ Step 5 : Test and the debug



### Step 1 : Preparation

- ▶ Laser cut the felt : 2 pieces for the body of the doll, mouth and patch-eye for decoration (.svg file [available](#))
- ▶ Iron the thermocollant fabric to the conductive fabric. Laser cut it. (.svg files available)
- ▶ Upload the Voodoo Lapin code on the Attiny45 via a AVR programmer.

### Step 2 : Solder the components to the PCB

- ▶ Solder all the components and the wires following the attached schema.

### Step 3 : Iron the conductive tissue and add resistors

- ▶ Glue the conductive fabric to the felt with an iron following the schema below.
- ▶ Solder the resistors and the wires to the conductive fabric following the schema below.
- ▶ Test the connections using a crocodile wire: by connecting each of the 6 pieces on the back of the Voodoo lapin to the conductive fabric on the front part, the LEDs shall blink differently.

### Step 4 : Sew and assemble

- ▶ Fill the lapin with cotton or fillings for dolls.
- ▶ Sew the borders to connect the parts. We recommend to use the blanket stitch following the pre-cut holes.
- ▶ Glue the mouth, the eye patch and the button around the small LED with white glue. It might be needed to enlarge the hole of the button to make the light of the led more visible.

### Step 5 : Test and the debug

- ▶ Test the Voodoo Lapin with a needle: depending on where it's picked, the eyes of the lapin should blink differently. If not picked, the leds shall not be on.
- ▶ If one or more connections don't work, massage the doll to see if it's caused by a short-circuit between the conductive fabric.

