Circuit Sculptures

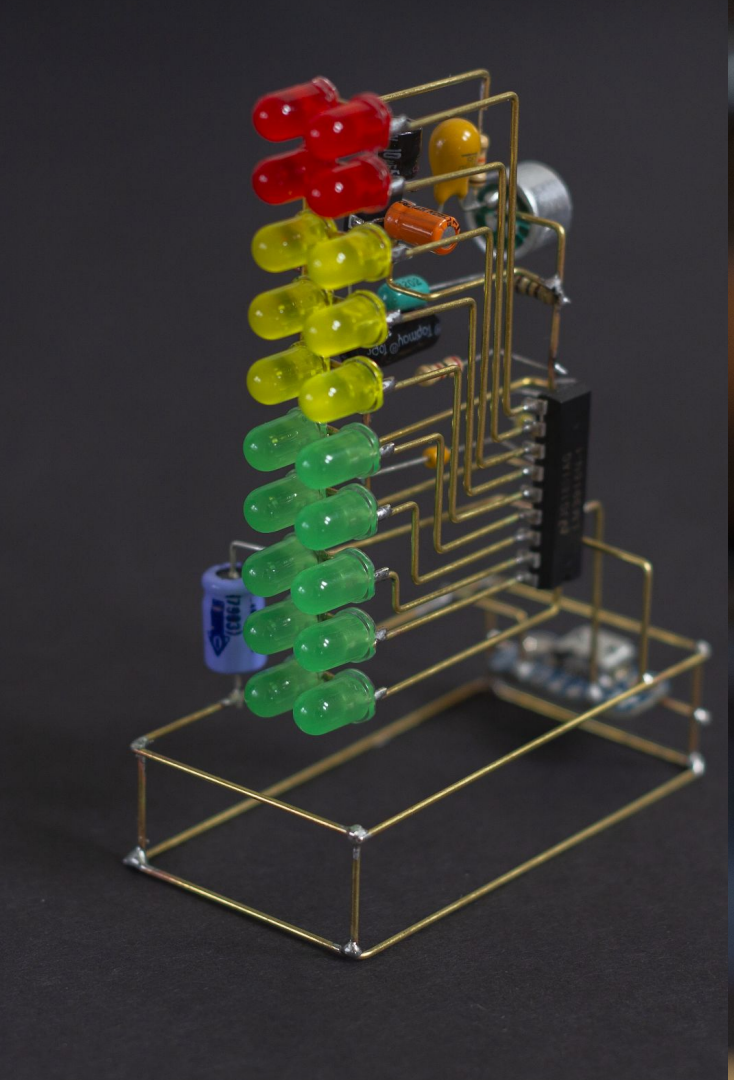
Remoticon 2020

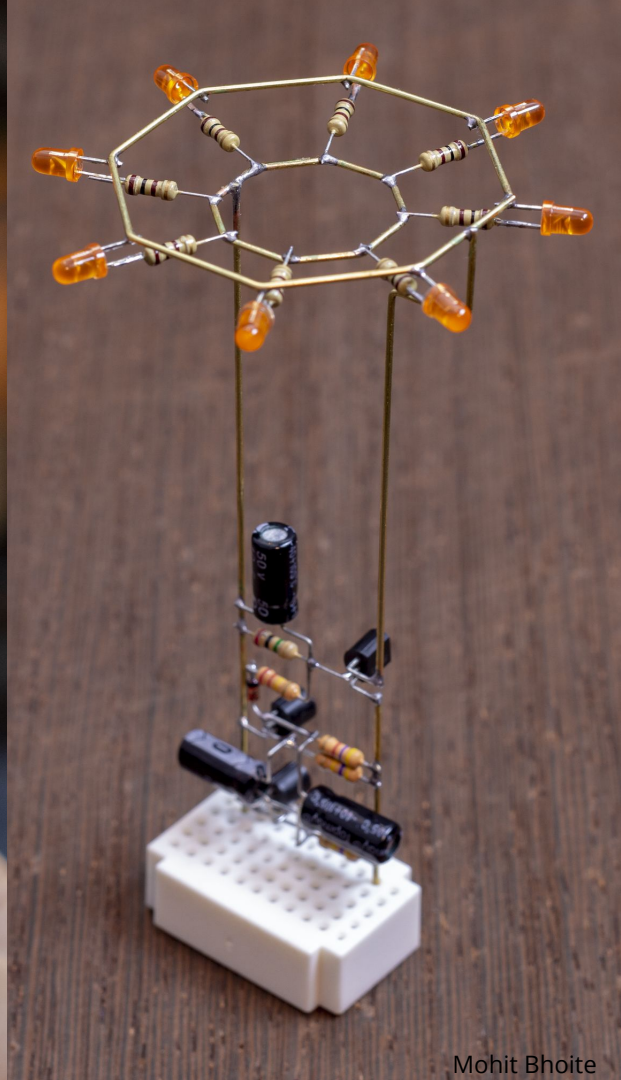
Kelly Heaton, Jiří Praus, and Mohit Bhoite

Mohit Bhoite

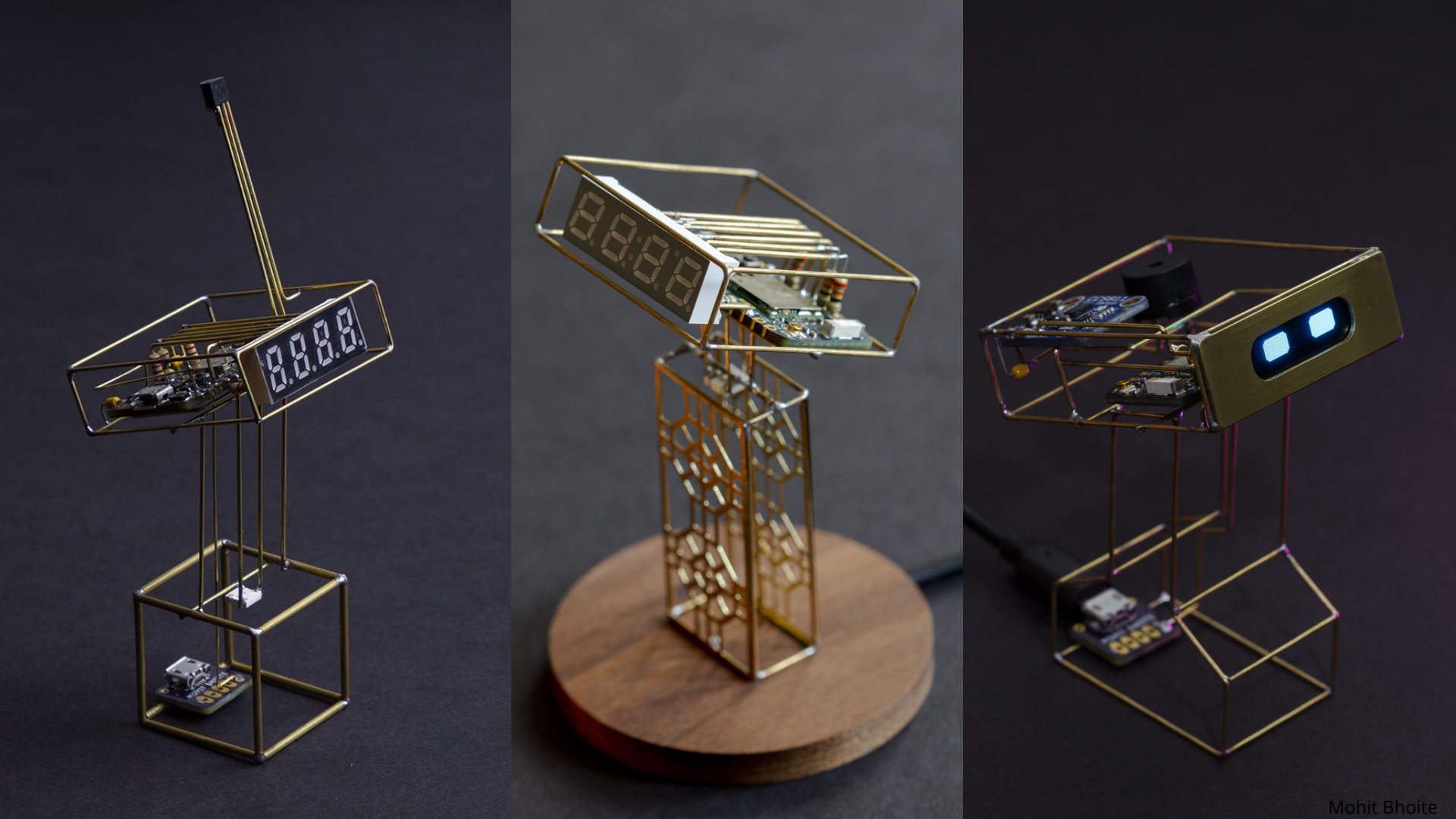
Sr. Hardware Engineer at Particle

I help design Particle's flagship IoT hardware products

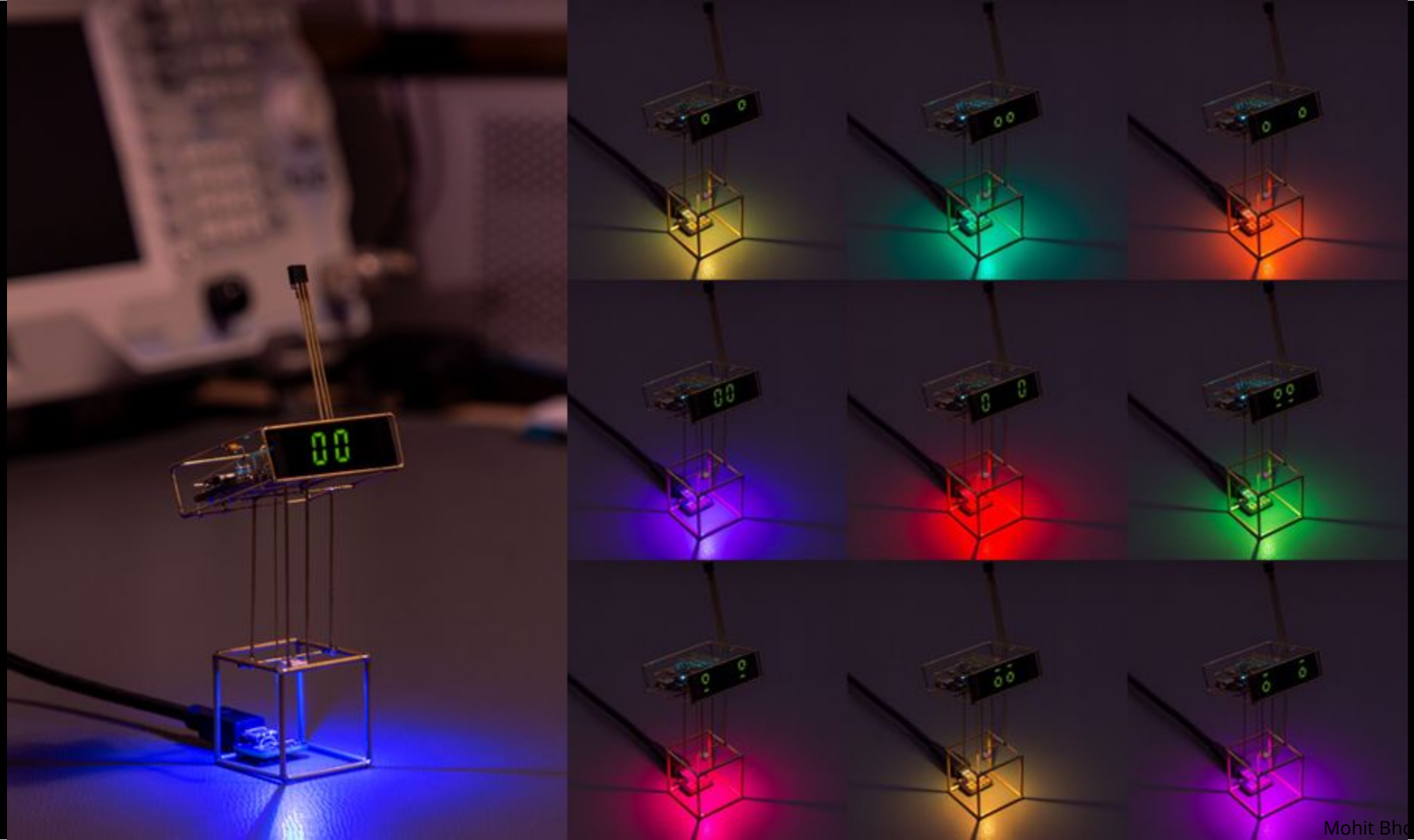




Mohit Bhoite



Mohit Bhoite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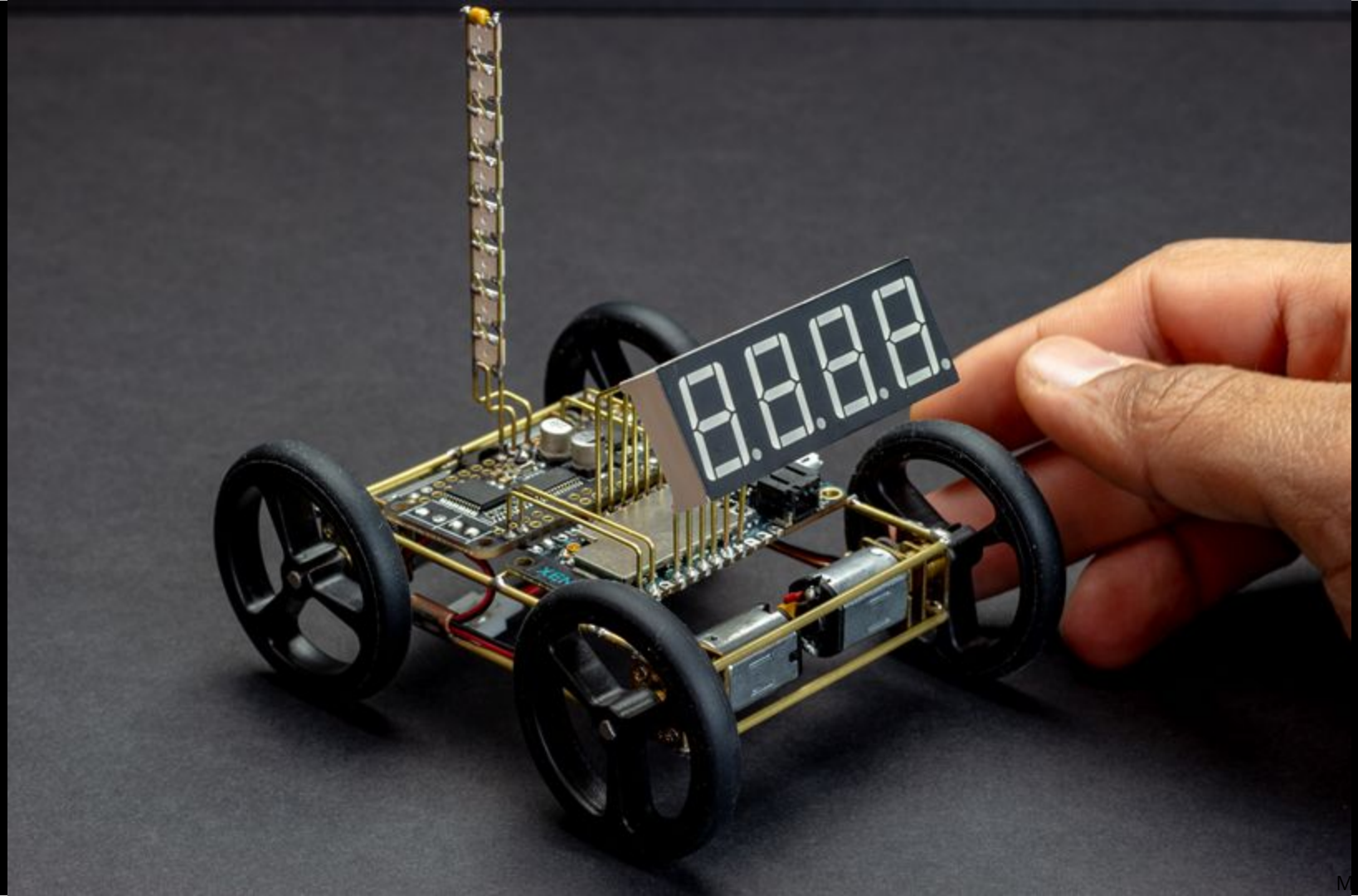
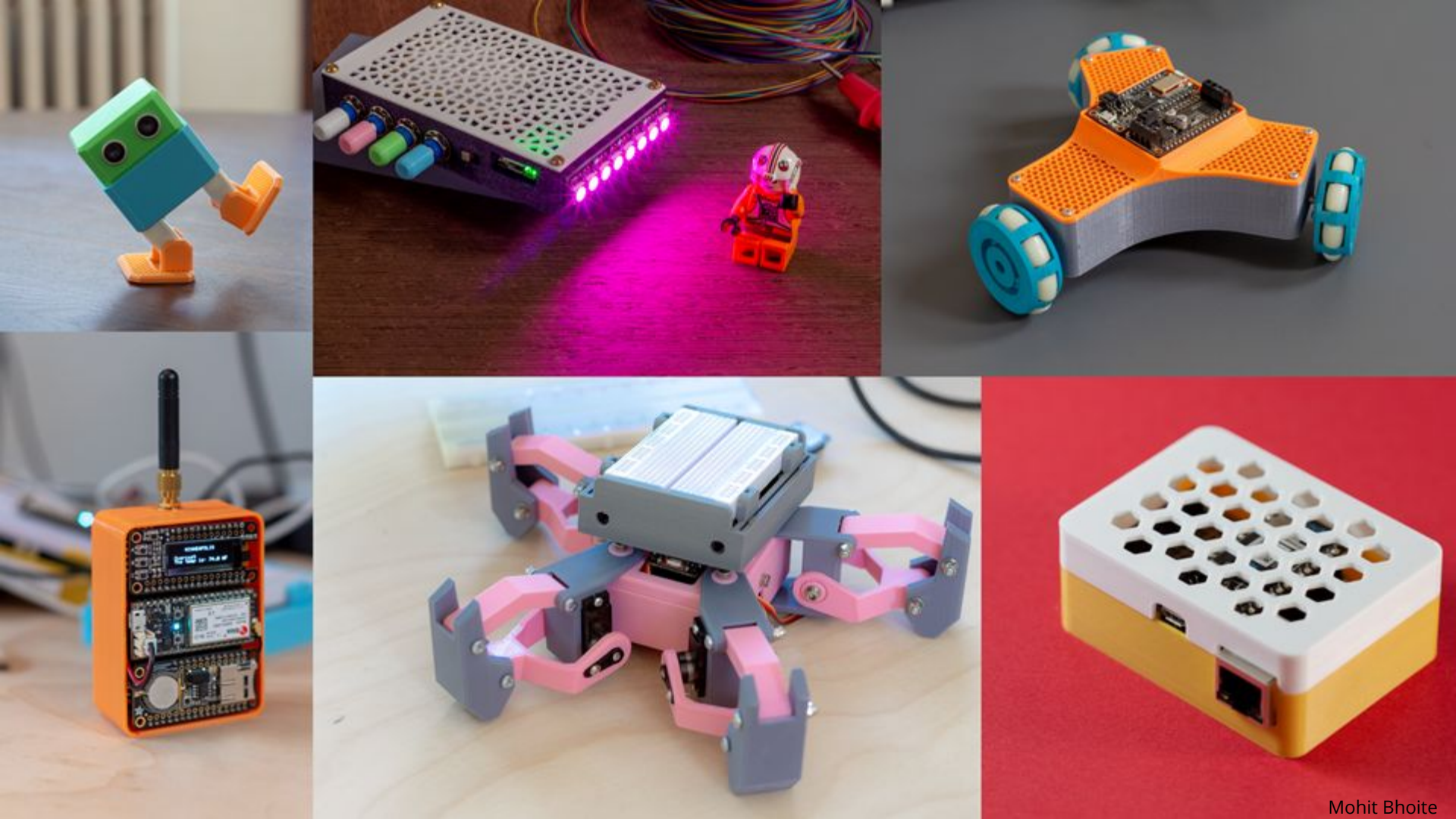

8.8.8.8.

Mohit Bhoite

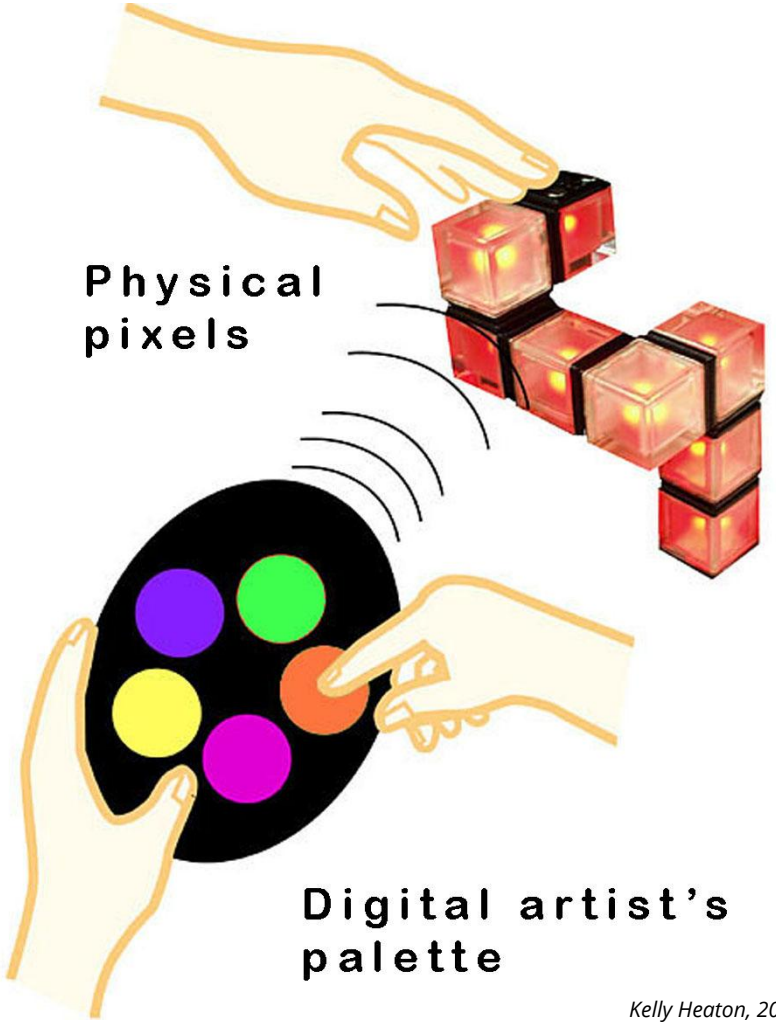

Mohit Bhoite

Kelly Heaton

Artist++

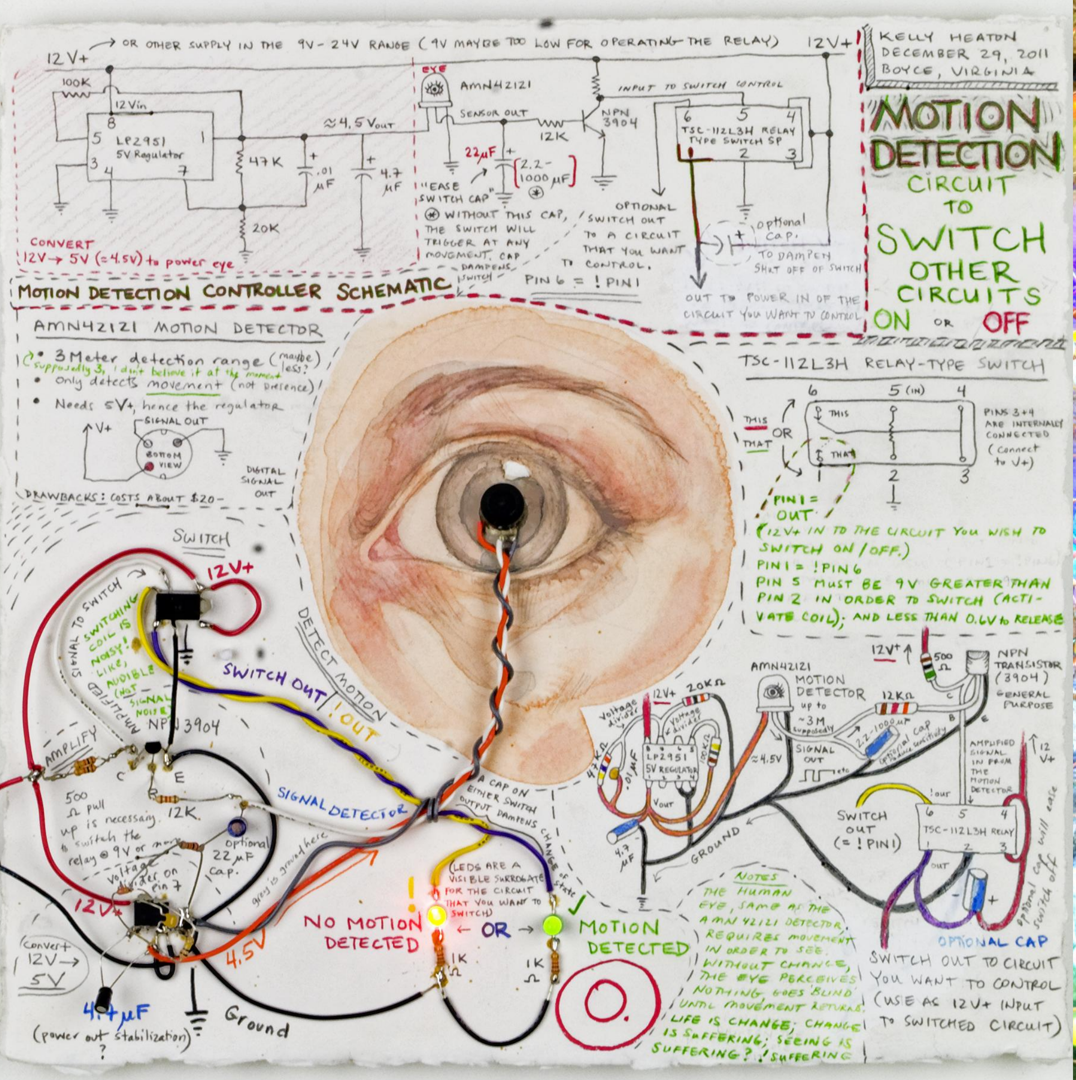
I’m a nature-lover fascinated by the definition of “life” and the origins of consciousness.

I make artistic and philosophical circuits.

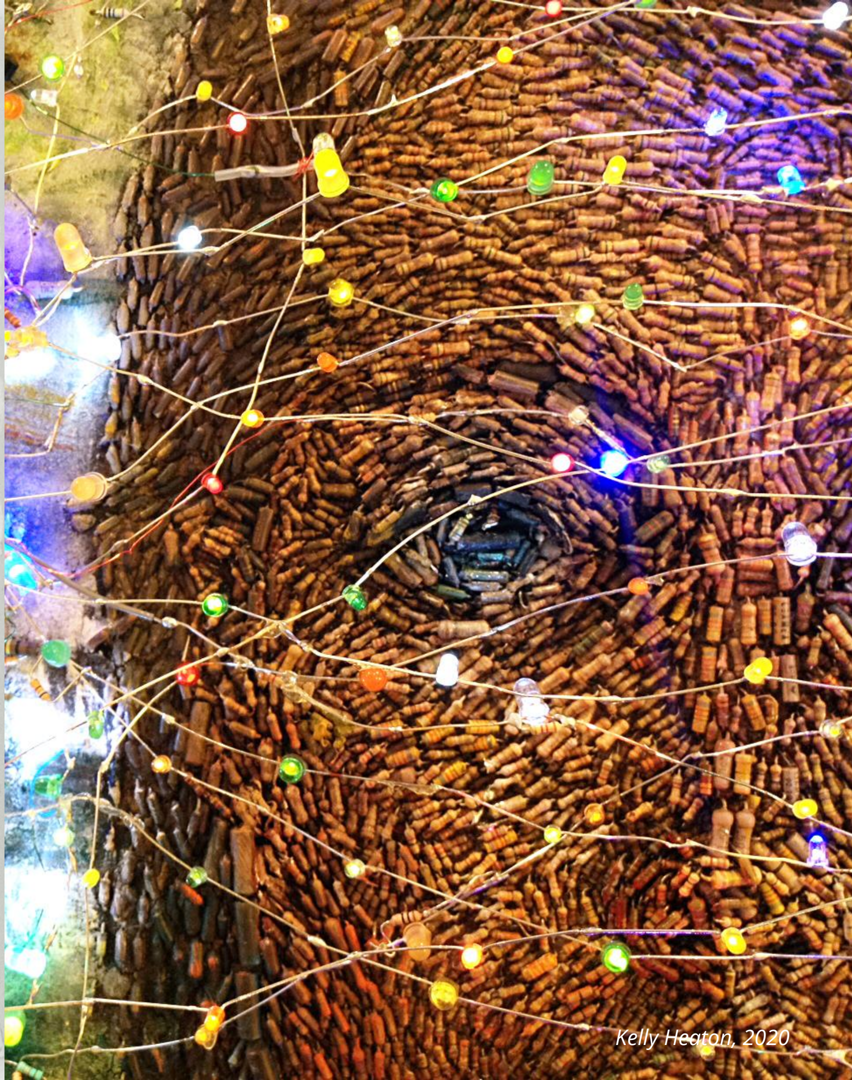


Kelly Heaton, 2020

Kelly Heaton, 2020

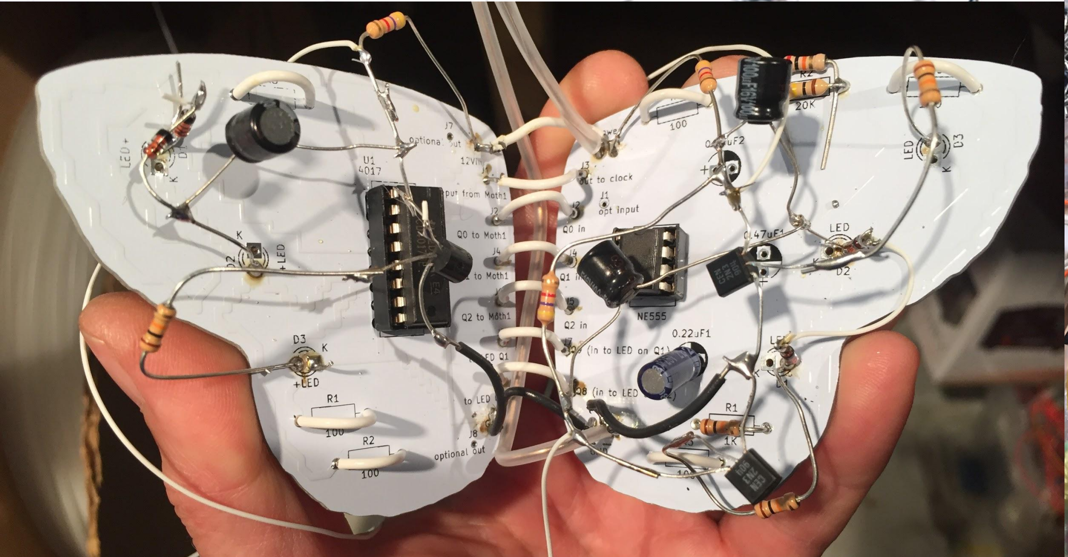


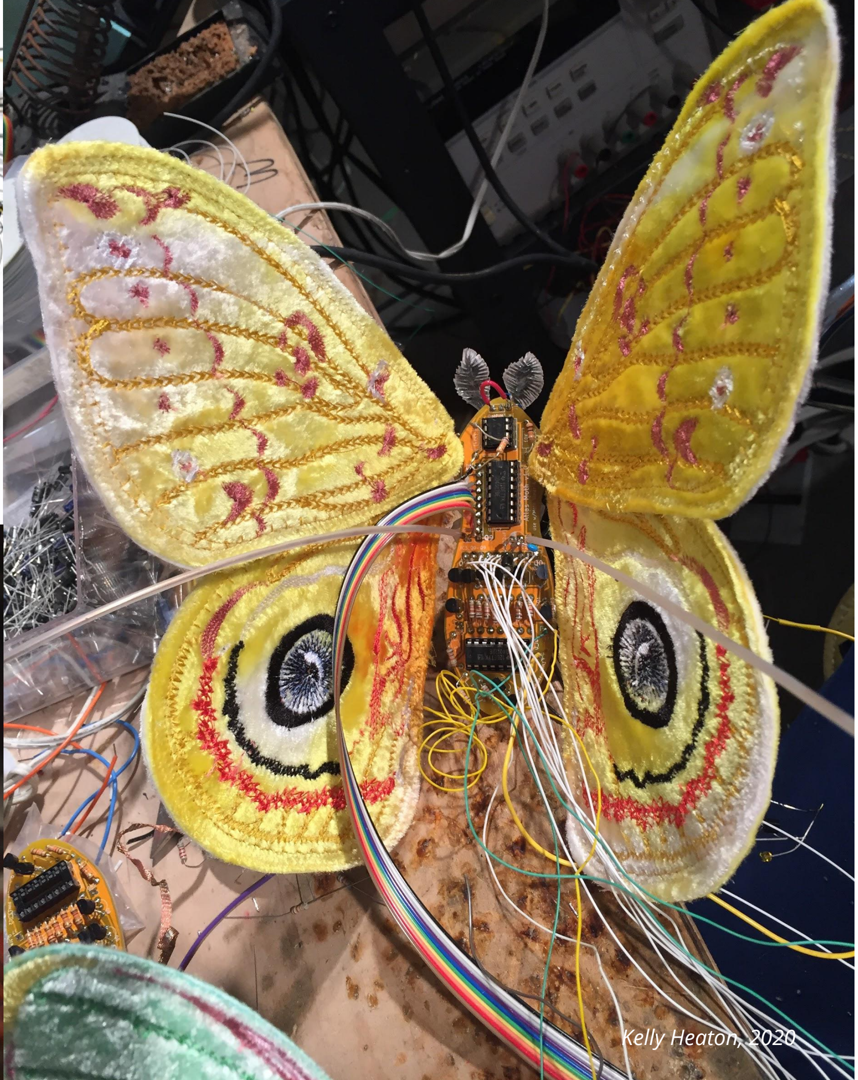
KELLY HEATON
DECEMBER 29, 2011
BOYCE, VIRGINIA
MOTION DETECTION
CIRCUIT TO SWITCH OTHER CIRCUITS
ON or OFF
MOTION DETECTION CONTROLLER SCHEMATIC
12V+ → OR OTHER SUPPLY IN THE 9V-24V RANGE (9V MAYBE TOO LOW FOR OPERATING THE RELAY)
LP2951 5V Regulator
AMN42121
SENSOR OUT
INPUT TO SWITCH CONTROL
NPN 3904
TSC-112L3H RELAY TYPE SWITCH SP
CONVERT 12V → 5V (≈4.5V) to power eye
PIN 6 = ! PIN 1
OUT TO POWER IN OF THE CIRCUIT YOU WANT TO CONTROL
AMN42121 MOTION DETECTOR
• 3 Meter detection range (maybe less?)
• Only detects movement (not presence)
• Needs 5V+, hence the regulator
DRAWBACKS: COSTS ABOUT $20-
TSC-112L3H RELAY-TYPE SWITCH
PINS 3+4 ARE INTERNALLY CONNECTED (connect to V+)
PIN 1 = OUT
(12V+ IN TO THE CIRCUIT YOU WISH TO SWITCH ON / OFF.)
PIN 1 = ! PIN 6
PIN 5 MUST BE 9V GREATER THAN PIN 2 IN ORDER TO SWITCH (ACTIVATE COIL); AND LESS THAN 0.6V to RELEASE
SWITCH
12V+
SWITCH OUT / ! OUT
DETECT MOTION
SIGNAL DETECTOR
AMPLIFY
NPN 3904
NO MOTION DETECTED
OR
MOTION DETECTED
Ground
OPTIONAL CAP
SWITCH OUT TO CIRCUIT YOU WANT TO CONTROL (USE AS 12V+ INPUT TO SWITCHED CIRCUIT)
NOTES
THE HUMAN EYE, SAME AS THE AMN 42121 DETECTOR, REQUIRES MOVEMENT IN ORDER TO SEE. WITHOUT CHANGE, THE EYE PERCEIVES NOTHING, GOES 'BLIND' UNTIL MOVEMENT RETURNS. LIFE IS CHANGE; CHANGE IS SUFFERING; SEEING IS SUFFERING? ! SUFFERING



Kelly Heaton, 2020

Kelly Heaton, 2020



Kelly Heaton, 2020


Kelly Heaton, 2020


Kelly Heaton, 2020

Kelly Heaton, 2020

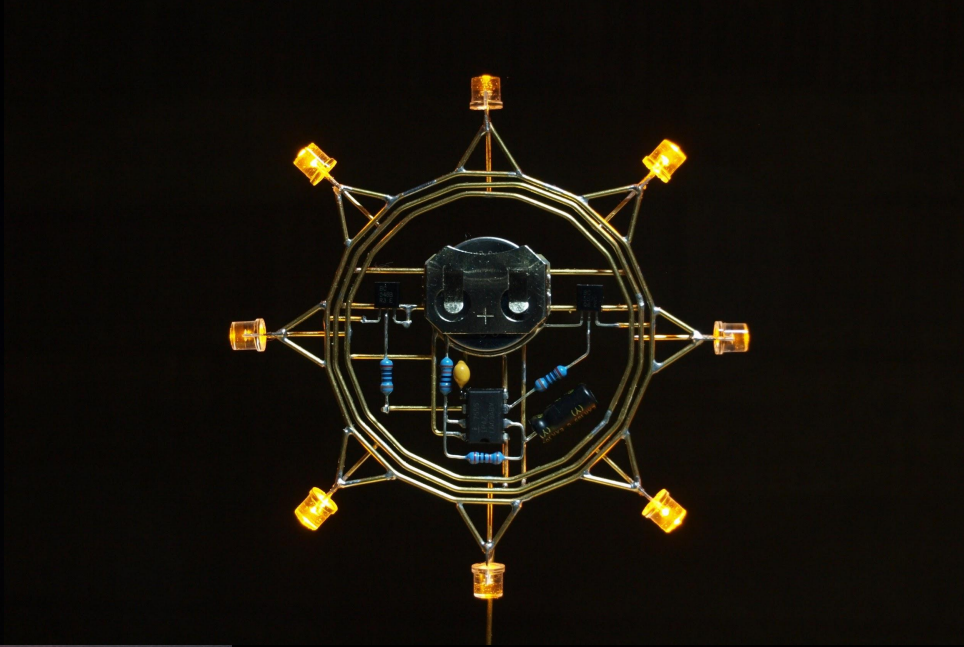

R8
R22
R23
R25
R18
R20
R21
R12
C1
470uF
C10
220uF
100uF
LS1
8ohm speaker
KELLY HEATON
PRETTY BIRD
2019
ON/OFF
J1
GND

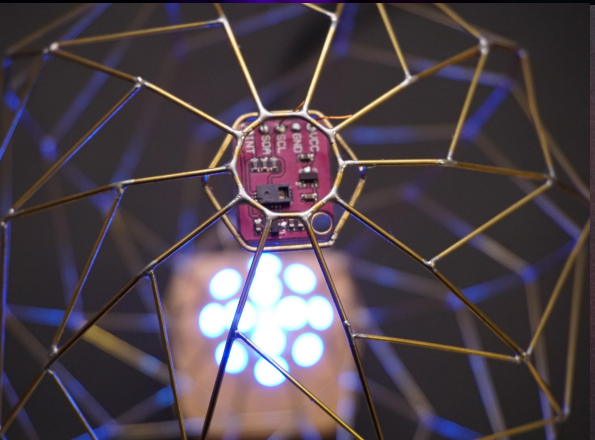

Kelly Heaton, 2020

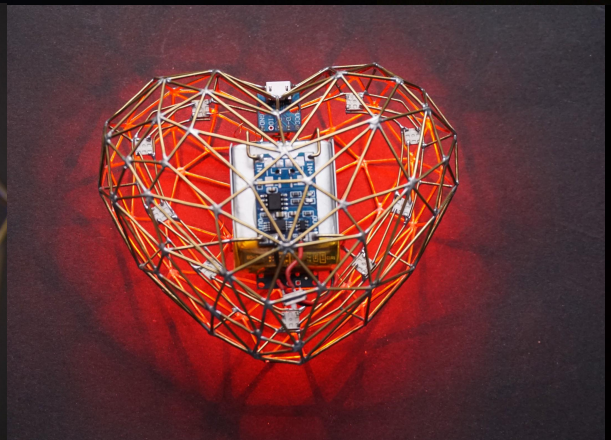
Jiří Praus

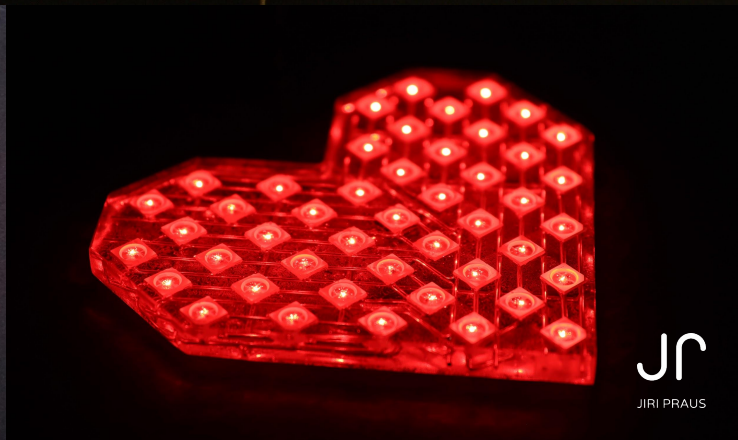
Maker, Software Engineer

I love 3D design, electronics and programming. Making electronics sculptures combines all my passions.

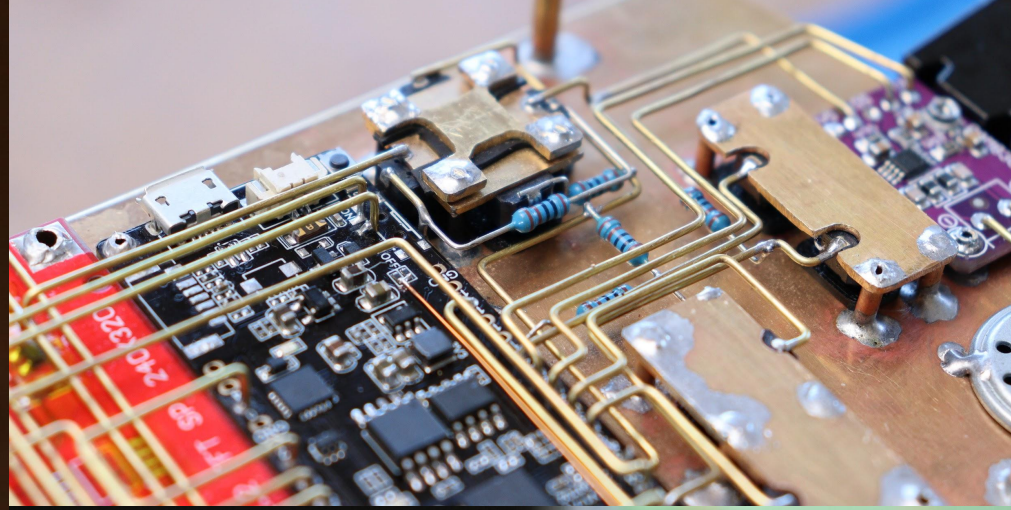


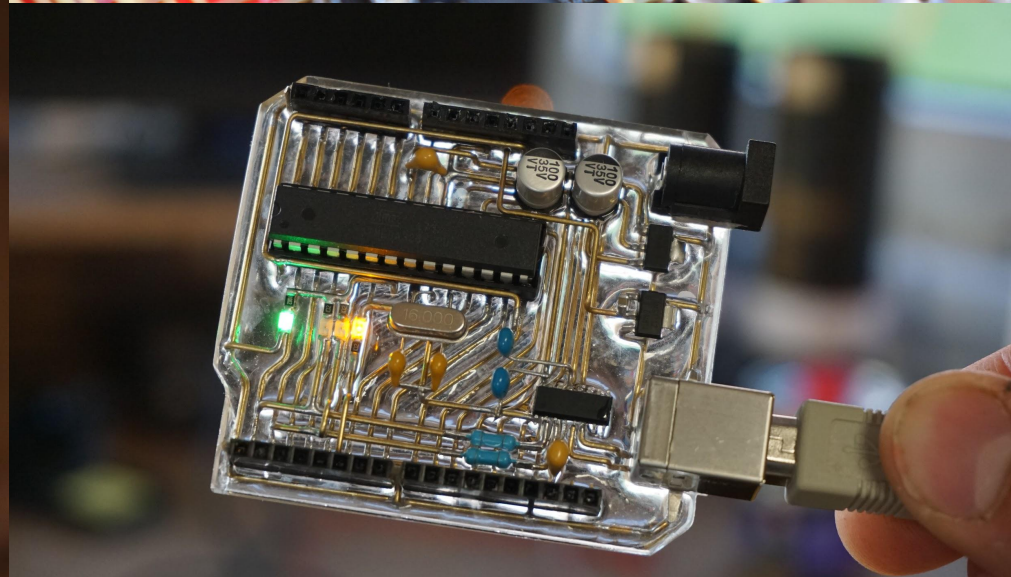




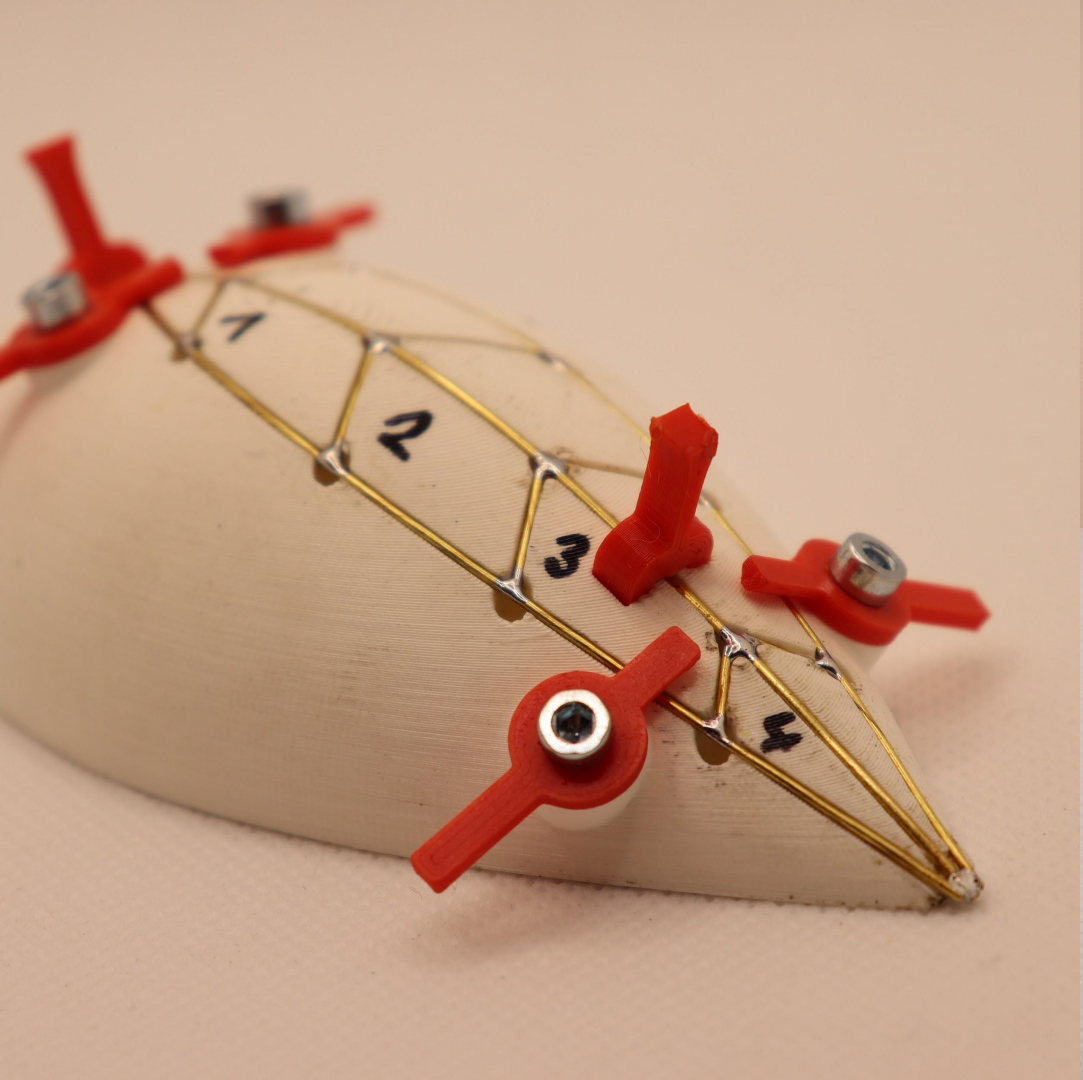

JIRI PRAUS

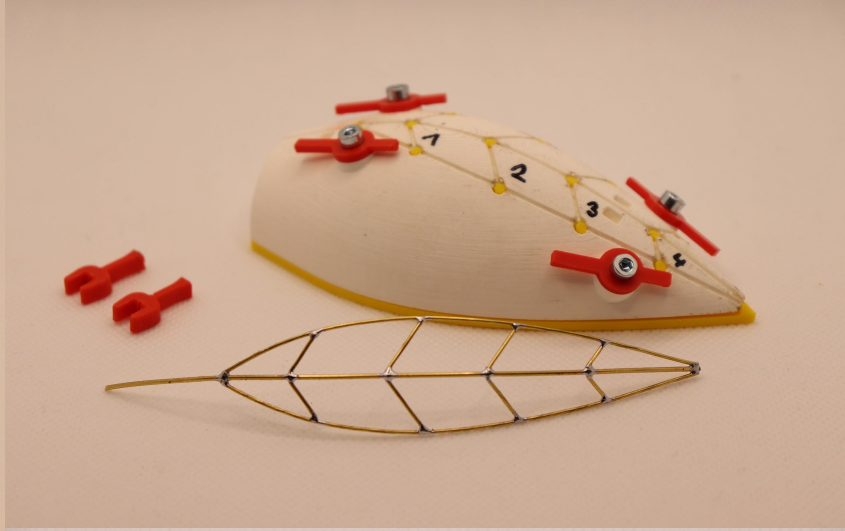

THE LEGEND OF
ZELDA
ORACLE OF
AGES™
©2001 Nintendo

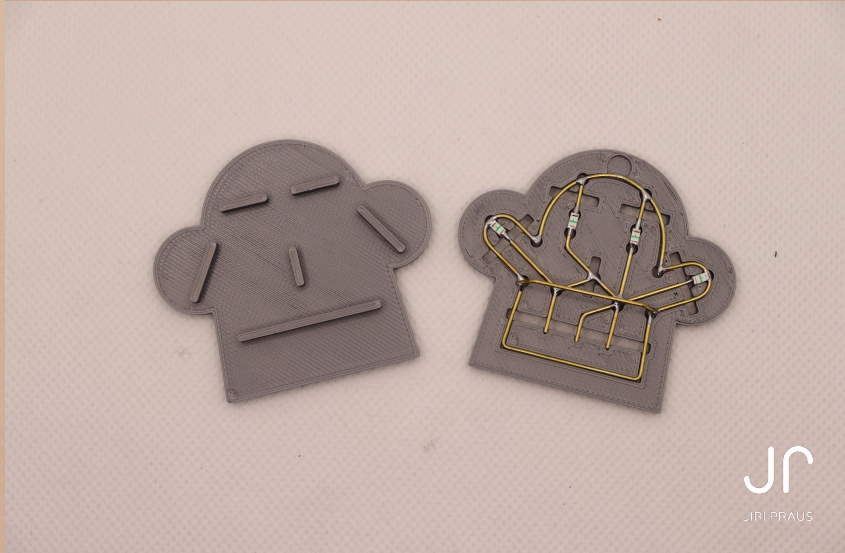





FLOWER







JIRI PRAUS


JIRI PRAUS

AGENDA

- Introductions
- Tools
- Soldering Techniques
- Building a firefly

GETTING STARTED

TOOLS

- Soldering Iron
- Solder
- Flux
- Pliers
- Diagonal/Flush cutters

SKILLS

- Basic soldering skills
- Basic understanding of electronics
- Patience

SOLDERING IRON

- 50W or higher
- Temperature controlled
- Replaceable tip
- Brass wool

Source: Digikey

SOLDER

- 0.4mm and 0.8mm
- No clean, water washable

Source: Digikey

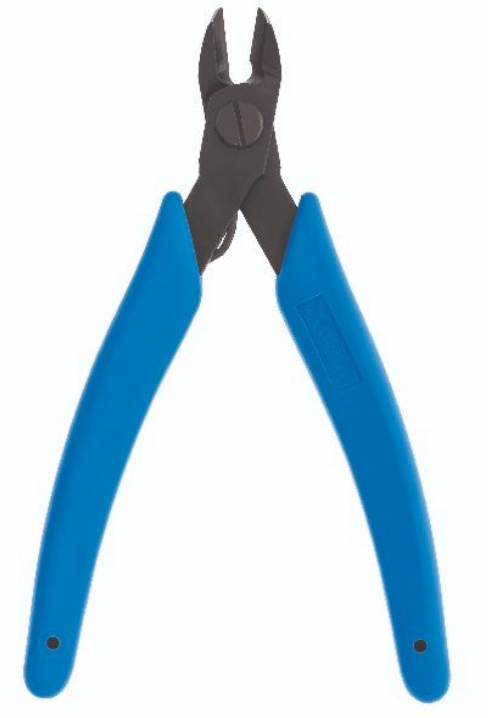
FLUX


goot
RoHS
HOBBY USE SOLDERING
PASTE
BS-10
はんだ付け用ペースト
ホビー・電線・電気工作用
プリント基板には使用できません。
Weak acid : Not applicable to PC boards.
弱酸性
NET.10g


circuitworks
WATER SOLUBLE
FLUX DISPENSING PEN
CW8300

PLIERS AND DIAGONAL CUTTERS

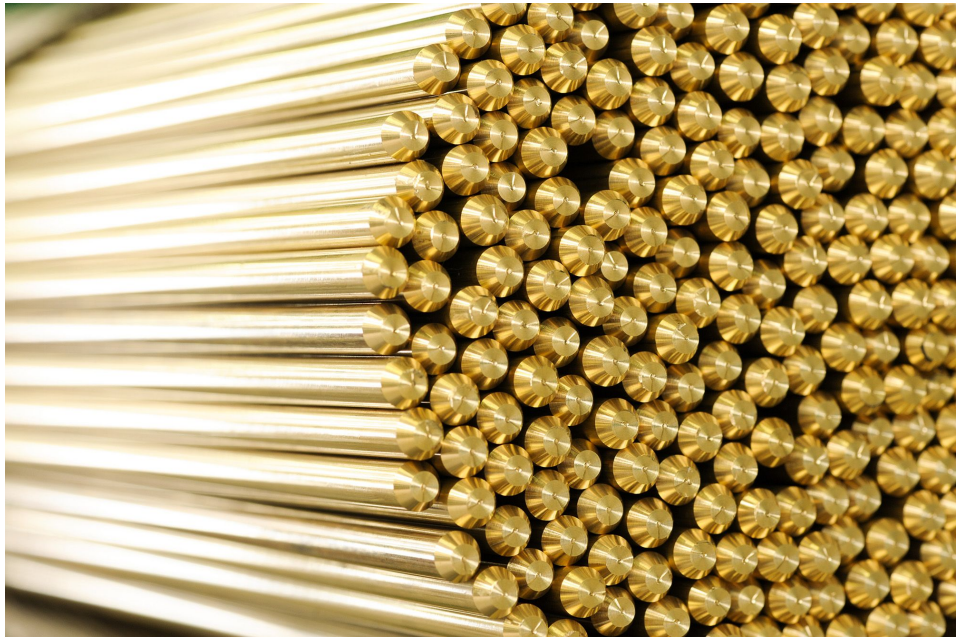
XURON 485



XURON 9100F

MATERIALS

BRASS RODS



0.5mm, **0.8mm**, 1mm

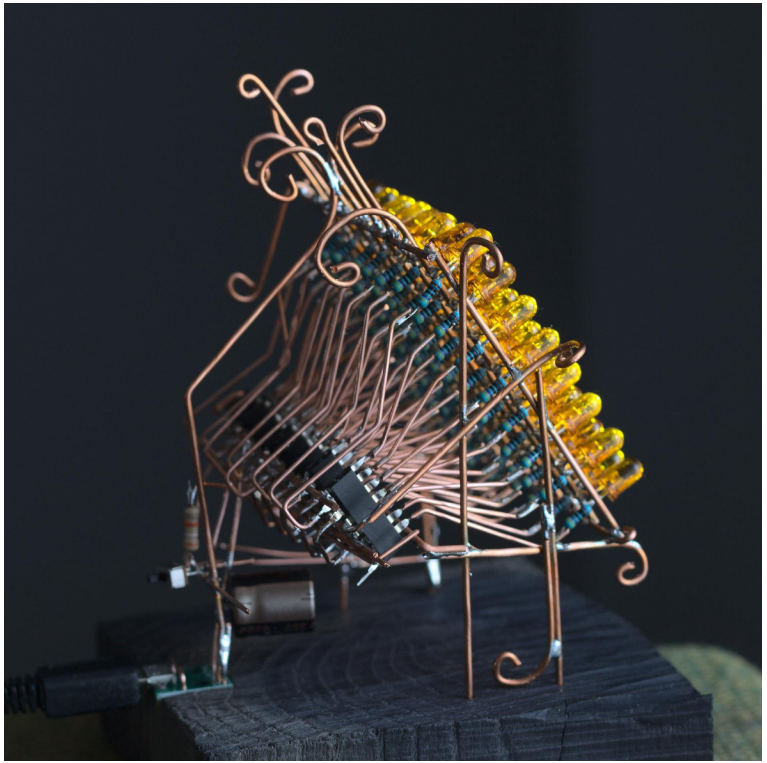
- K&S Metals
- Ace Hardware
- Most hobby stores
- BLICK Arts
- Micromark

BRASS WIRE

18 AWG, **20 AWG**

- Either red or yellow “half-hard” brass wire
- Don’t buy “dead-soft”

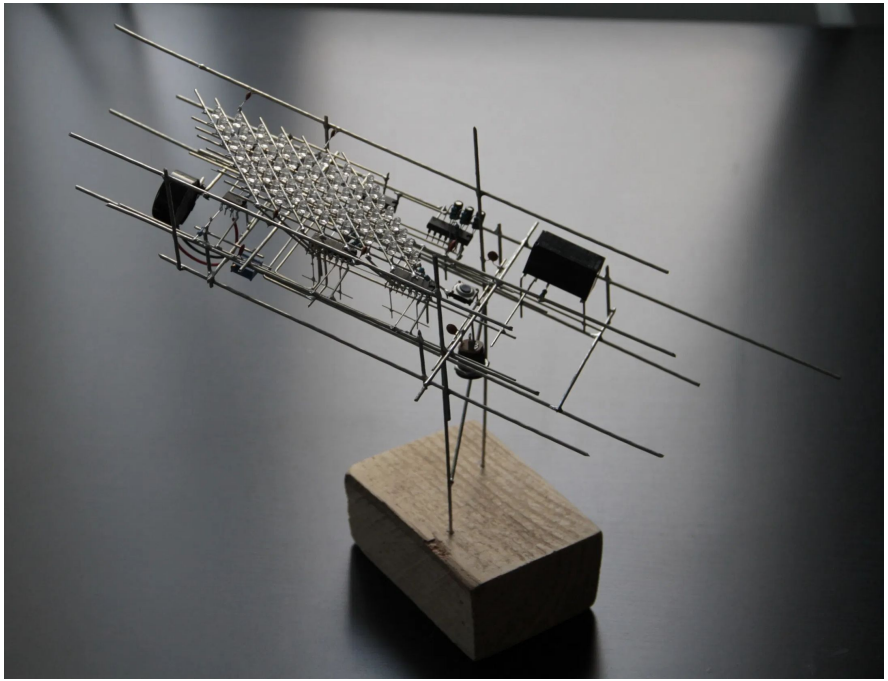
COPPER



18 AWG, **20 AWG**

Tauno Erik

TIN PLATED - COPPER/ STEEL

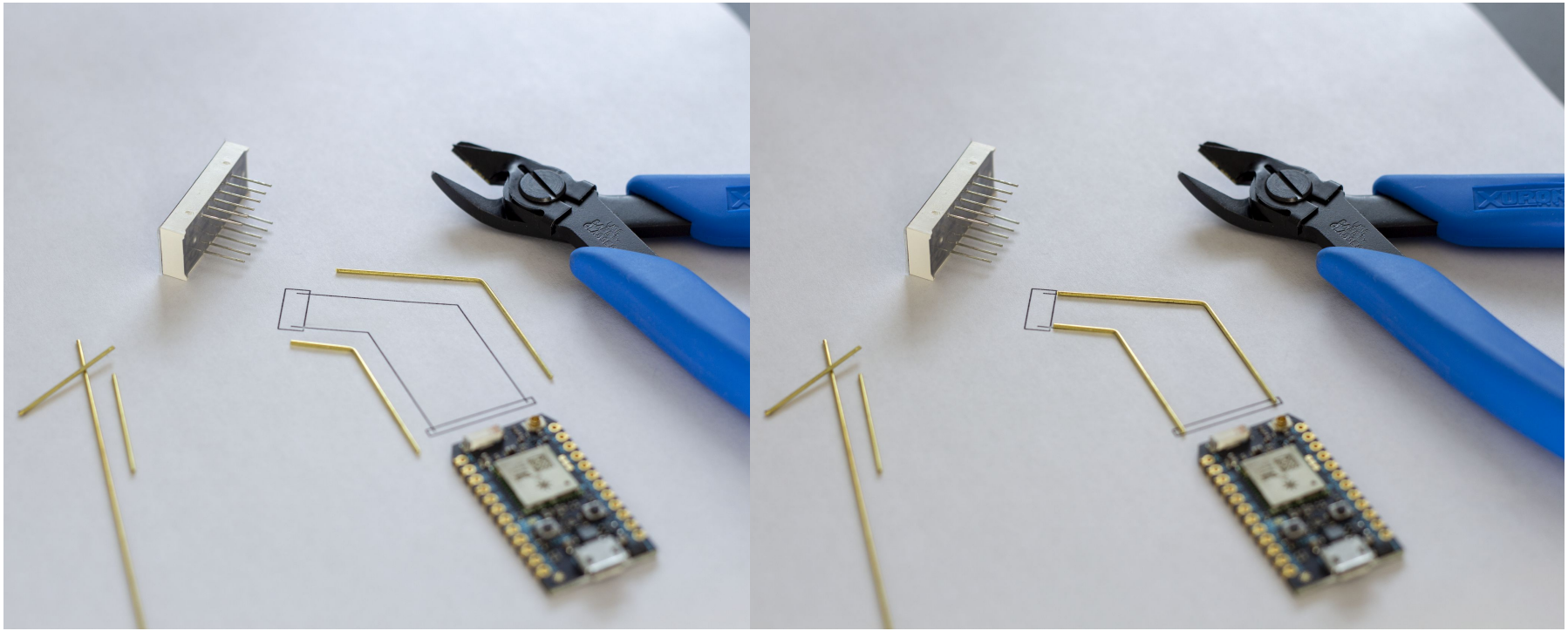


18 AWG, **20 AWG**

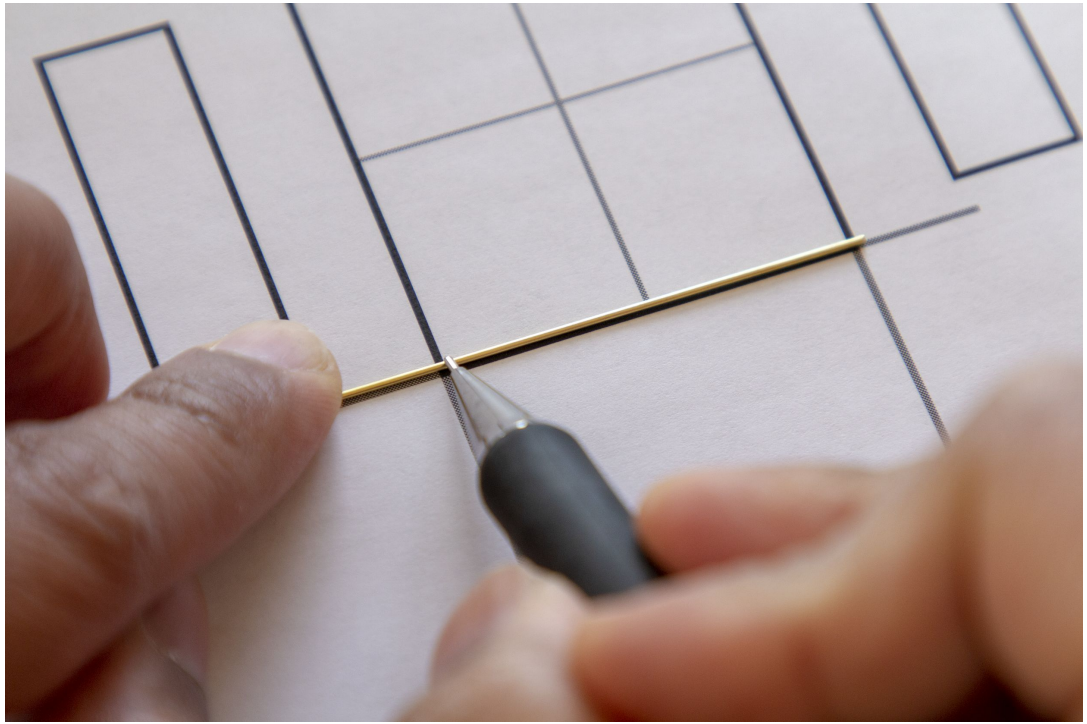
Eirik Brandal

WORKING WITH BRASS

CUTTING AND BENDING

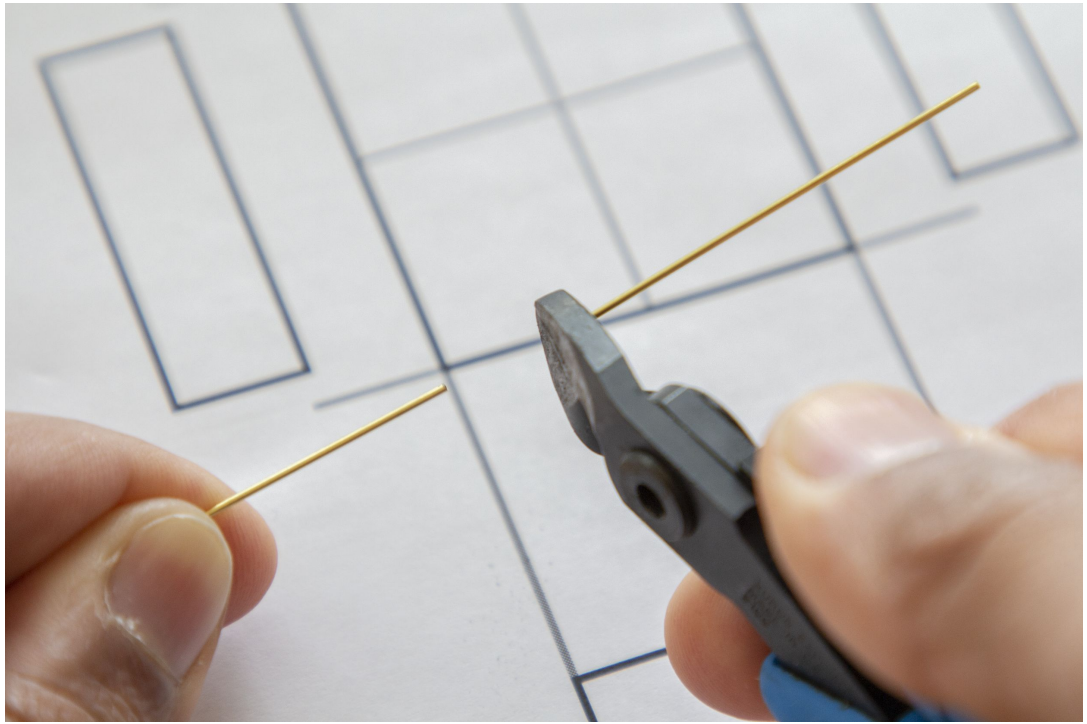


MARKING WITH A GRAPHITE PENCIL

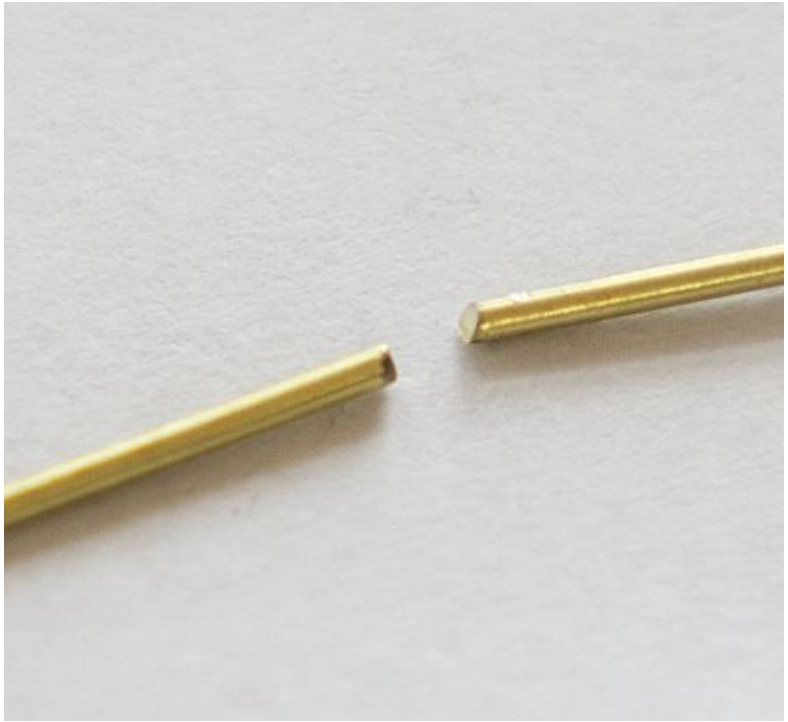


CUTTING

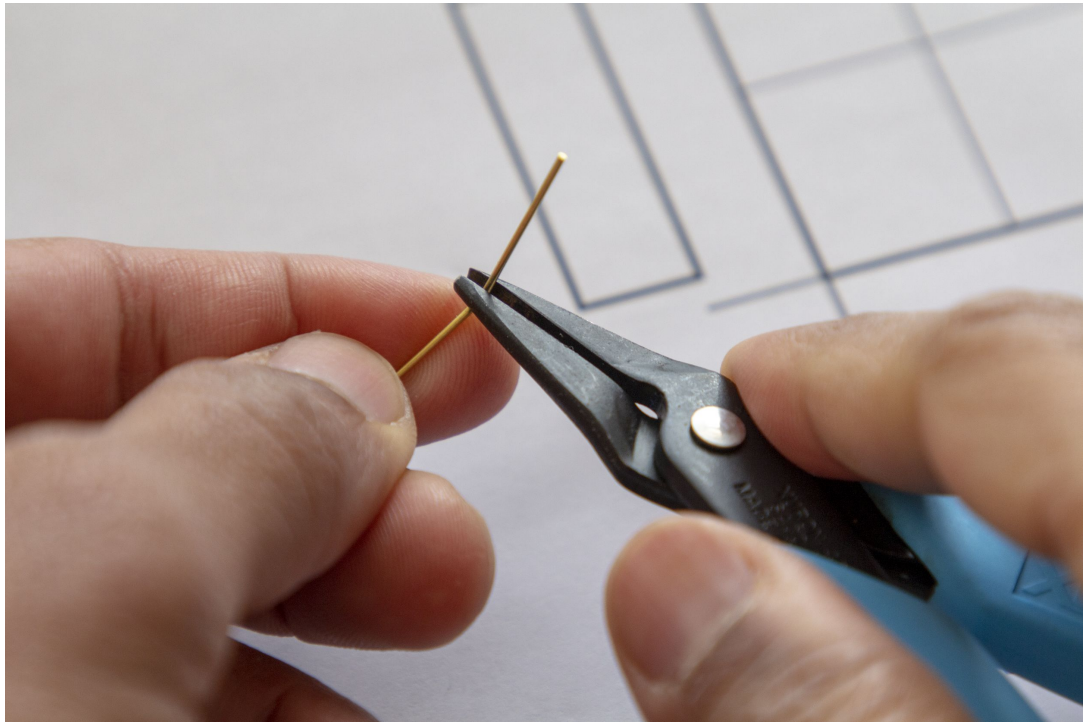
CUTTING: NO FLYING BRASS PROJECTILES!



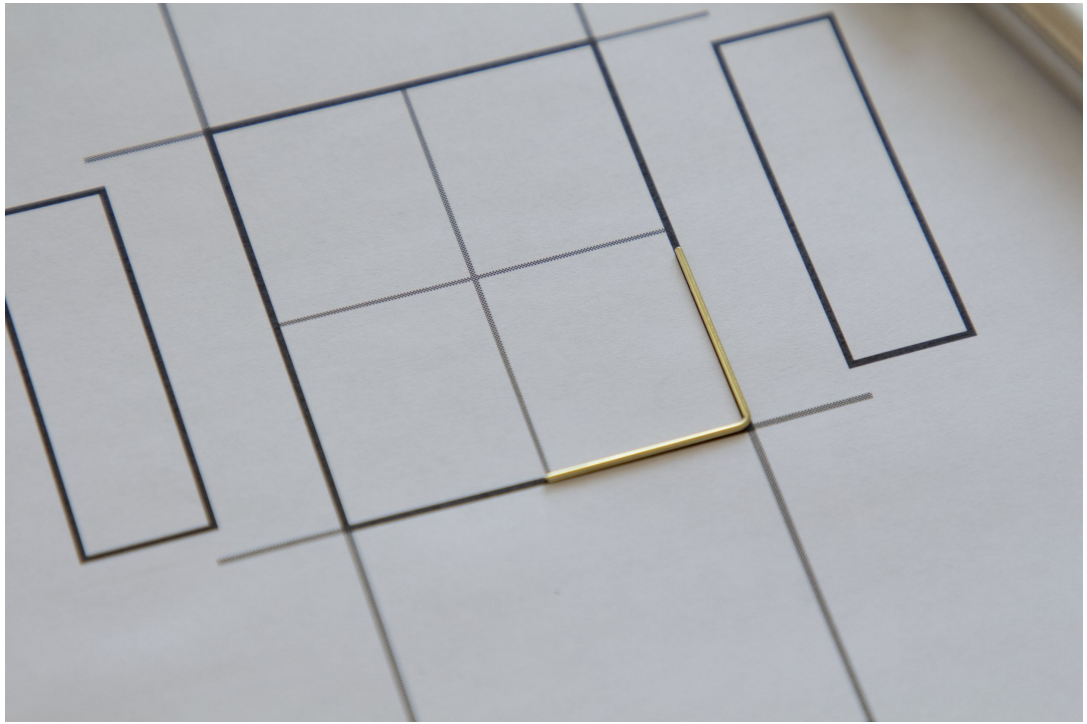
THE CUTS ARE NOT THE SAME!



BENDING

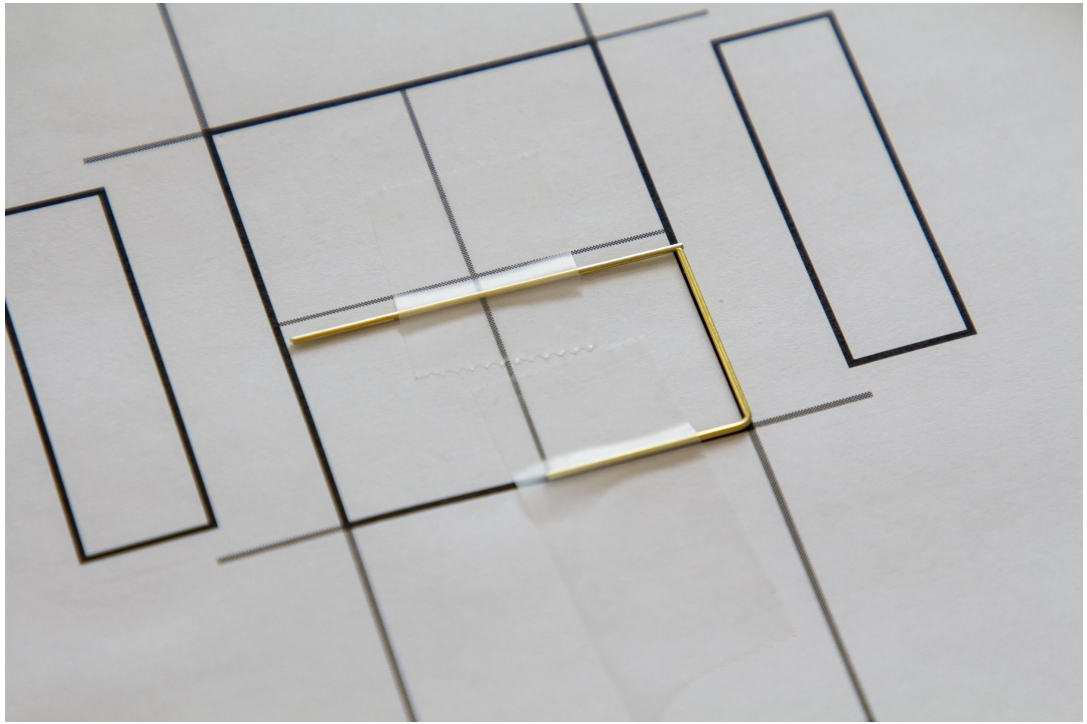


BENDING

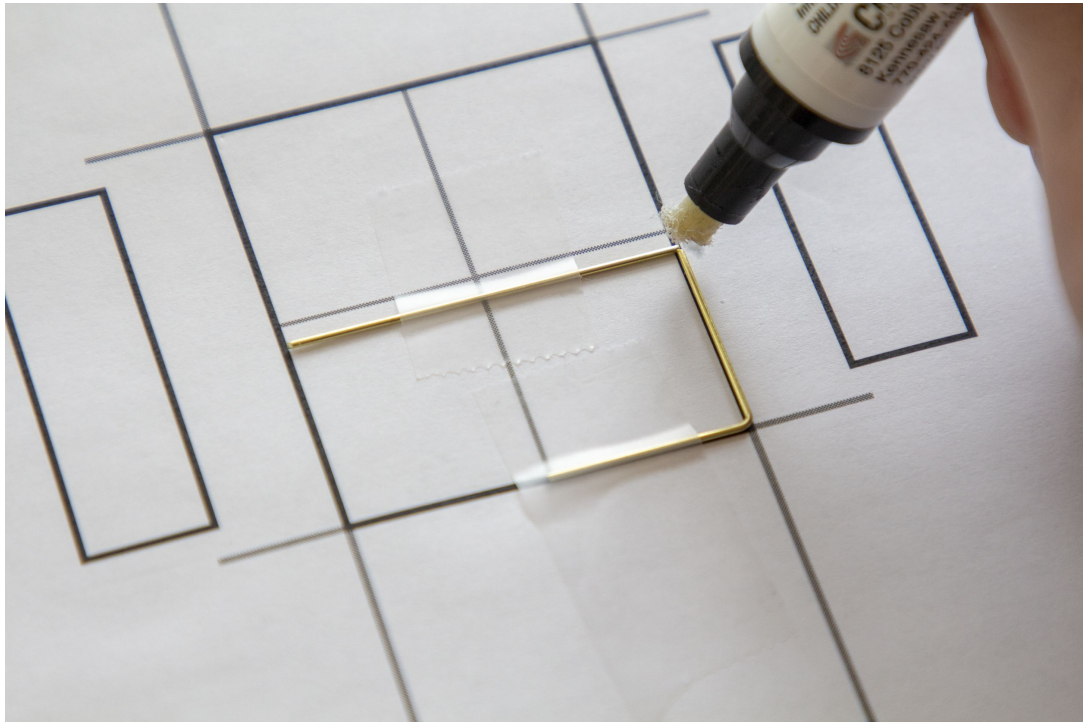


SOLDERING

SOLDERING: FIX DESIGN TO THE TEMPLATE

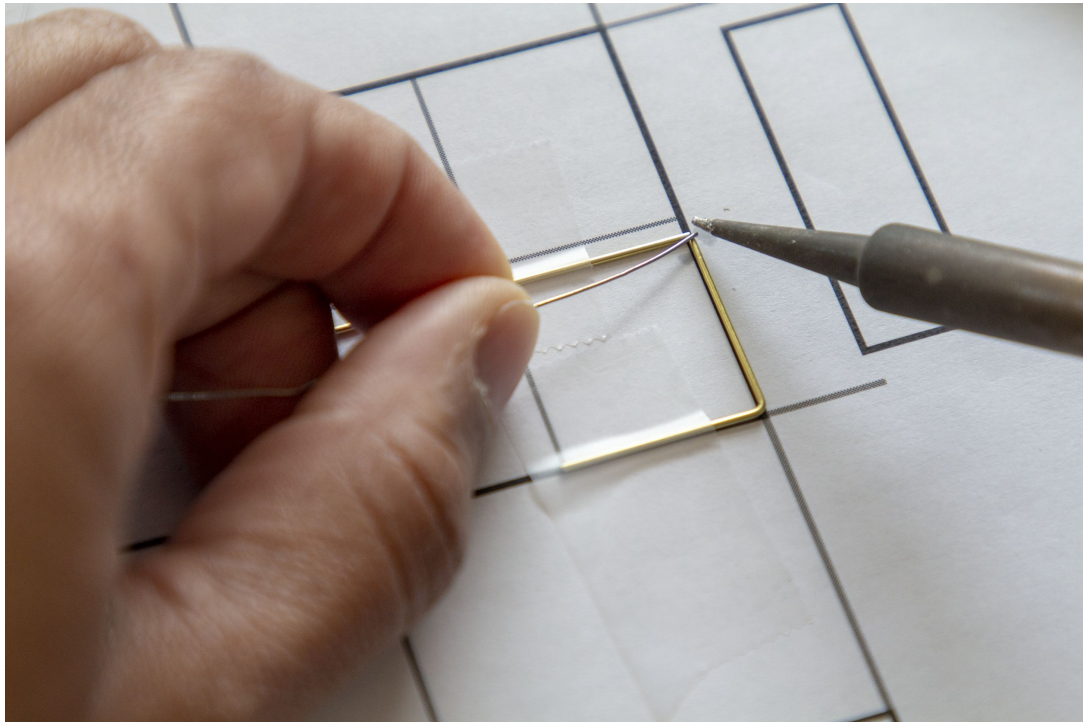


SOLDERING: APPLY FLUX



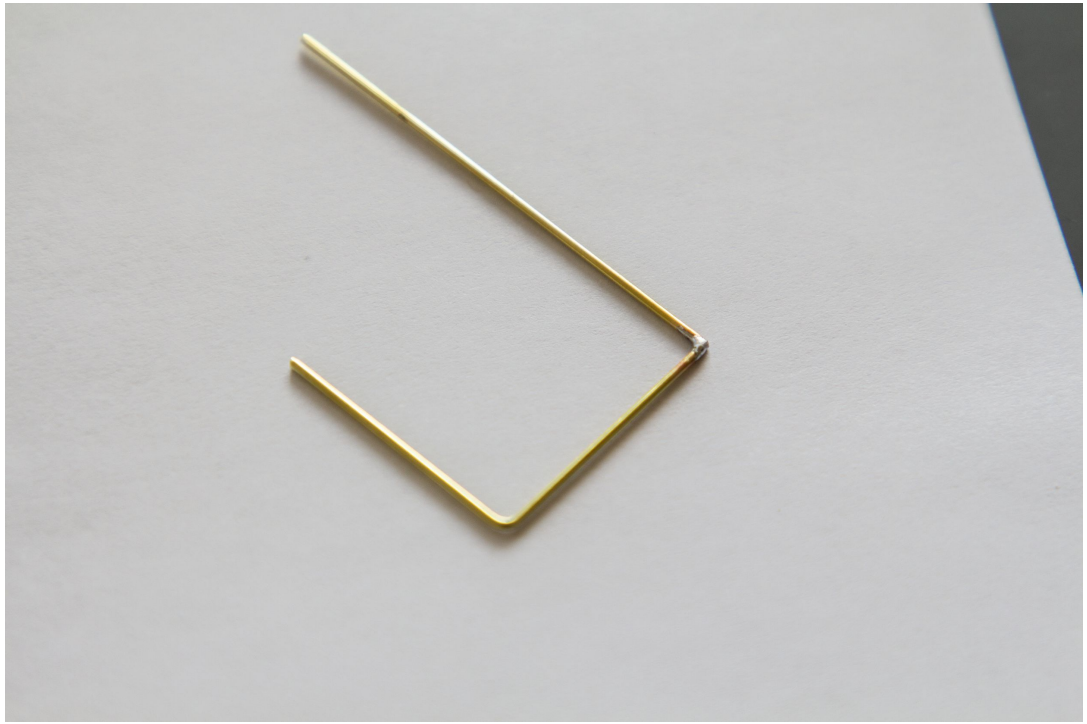
Mohit Bhoite

SOLDERING: SOLDER!

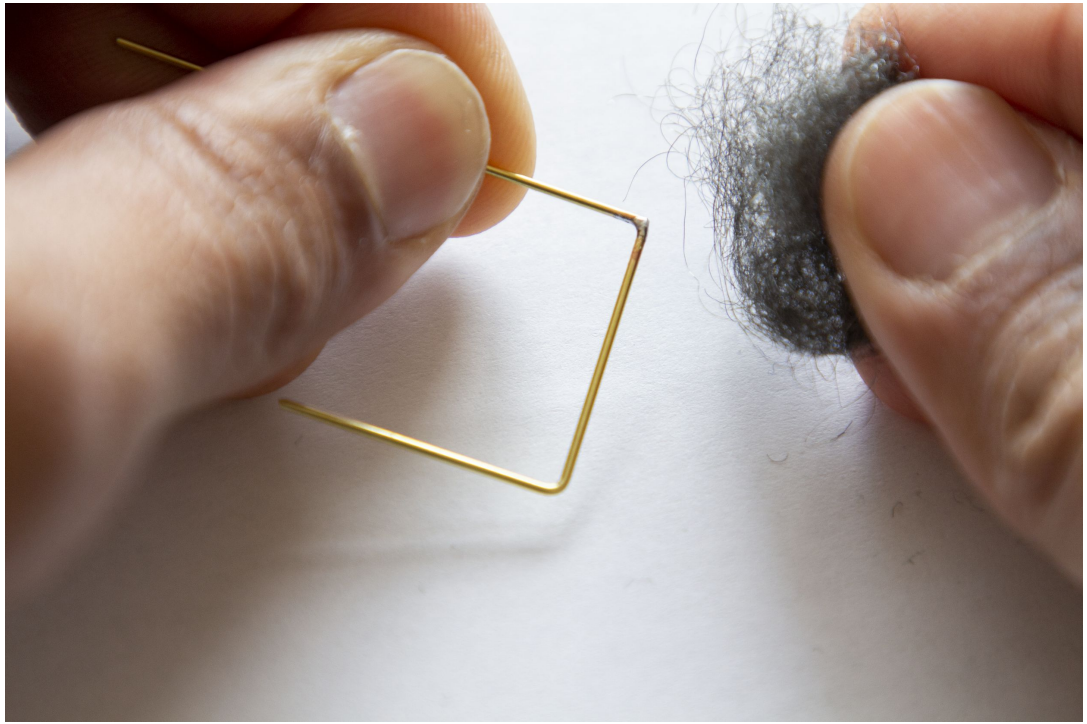


Mohit Bhoite

SOLDERING: TADA!

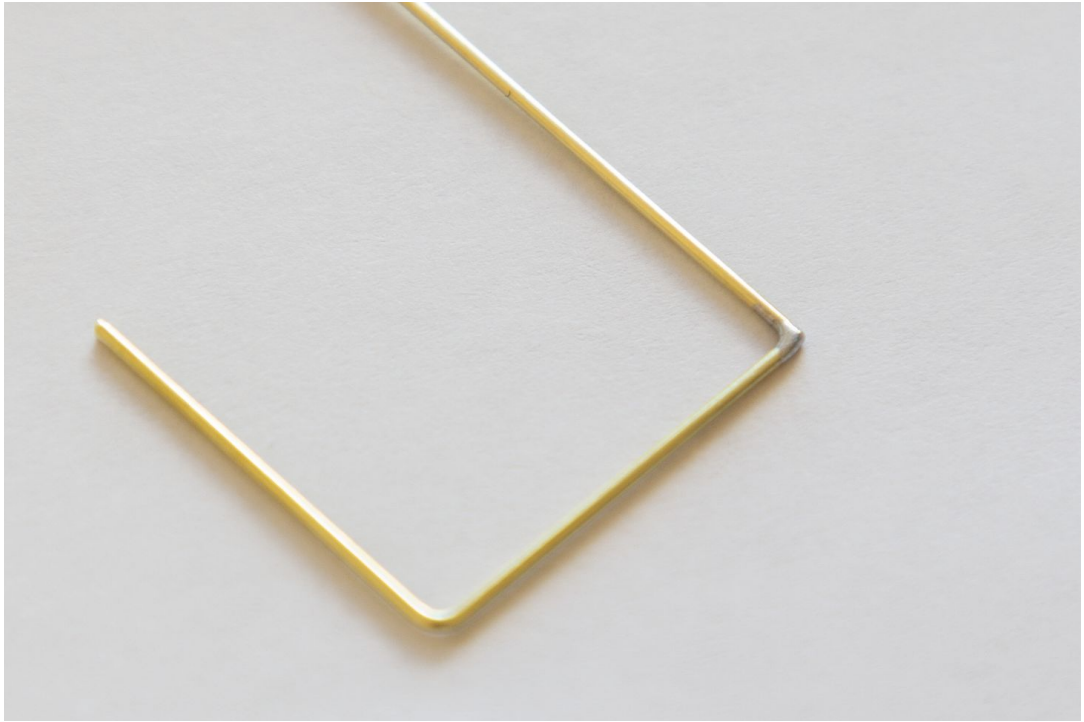


POST PROCESS: #000 STEEL WOOL

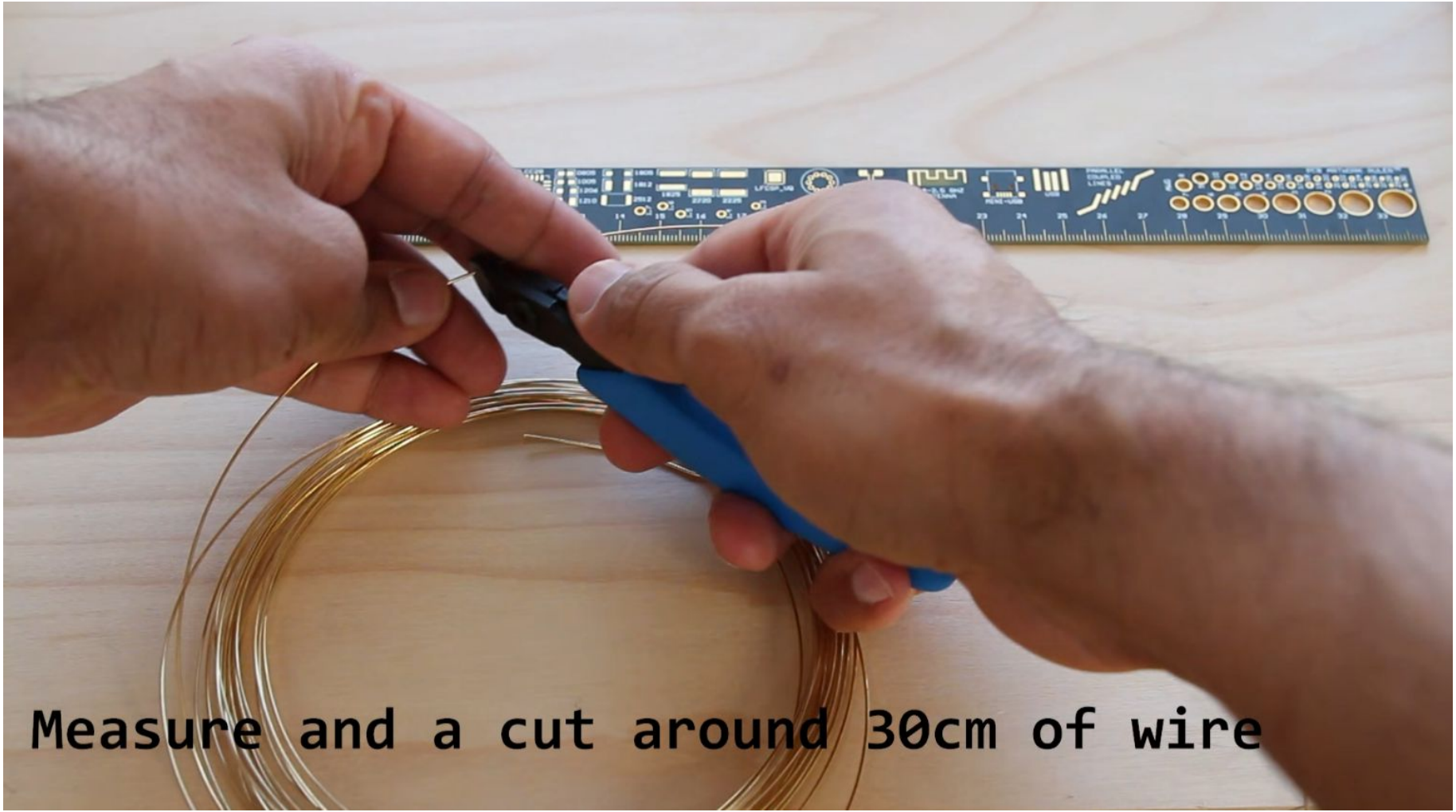


Mohit Bhoite

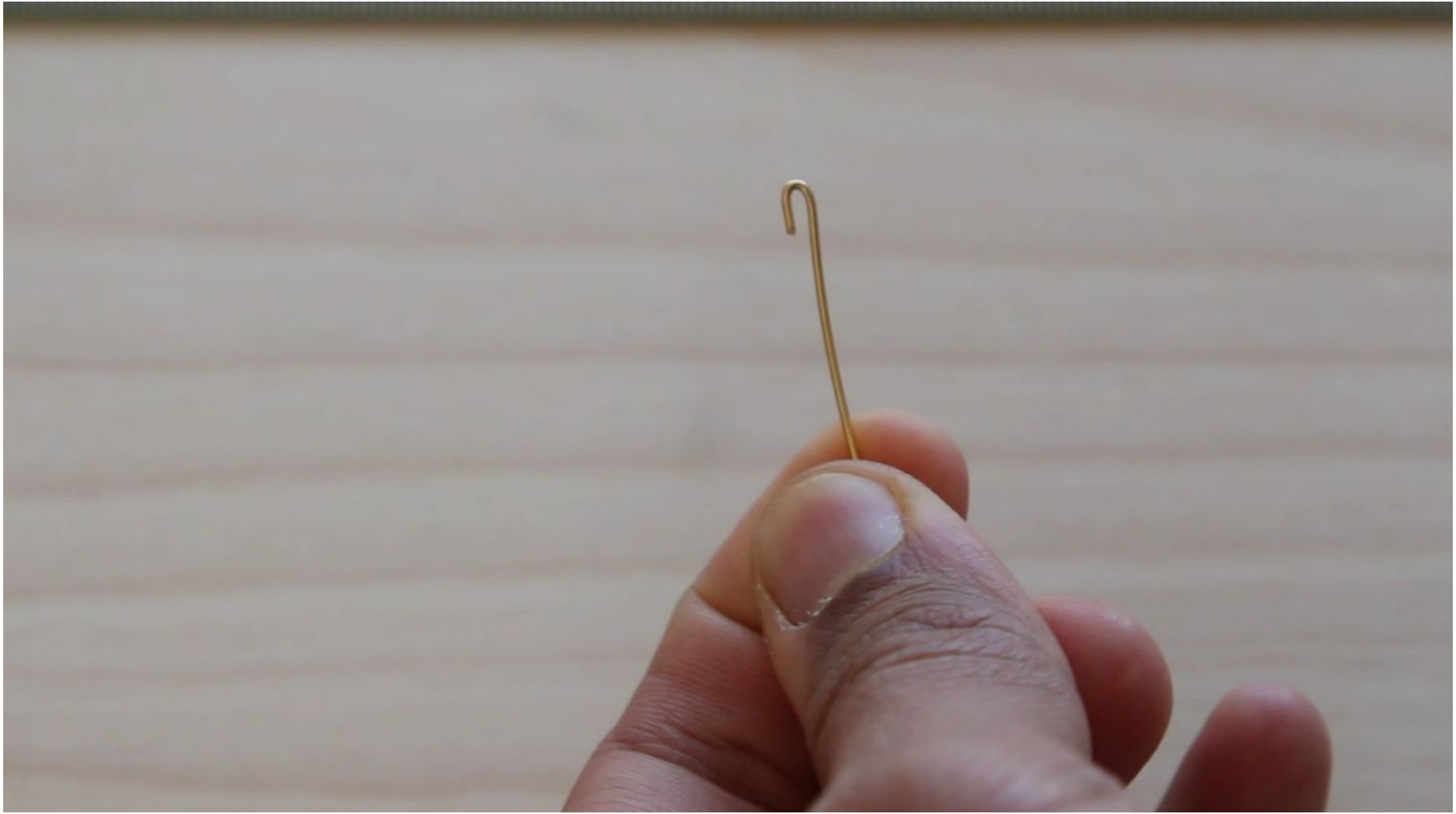
POST PROCESS: FINAL RESULT



TURNING WIRES INTO RODS

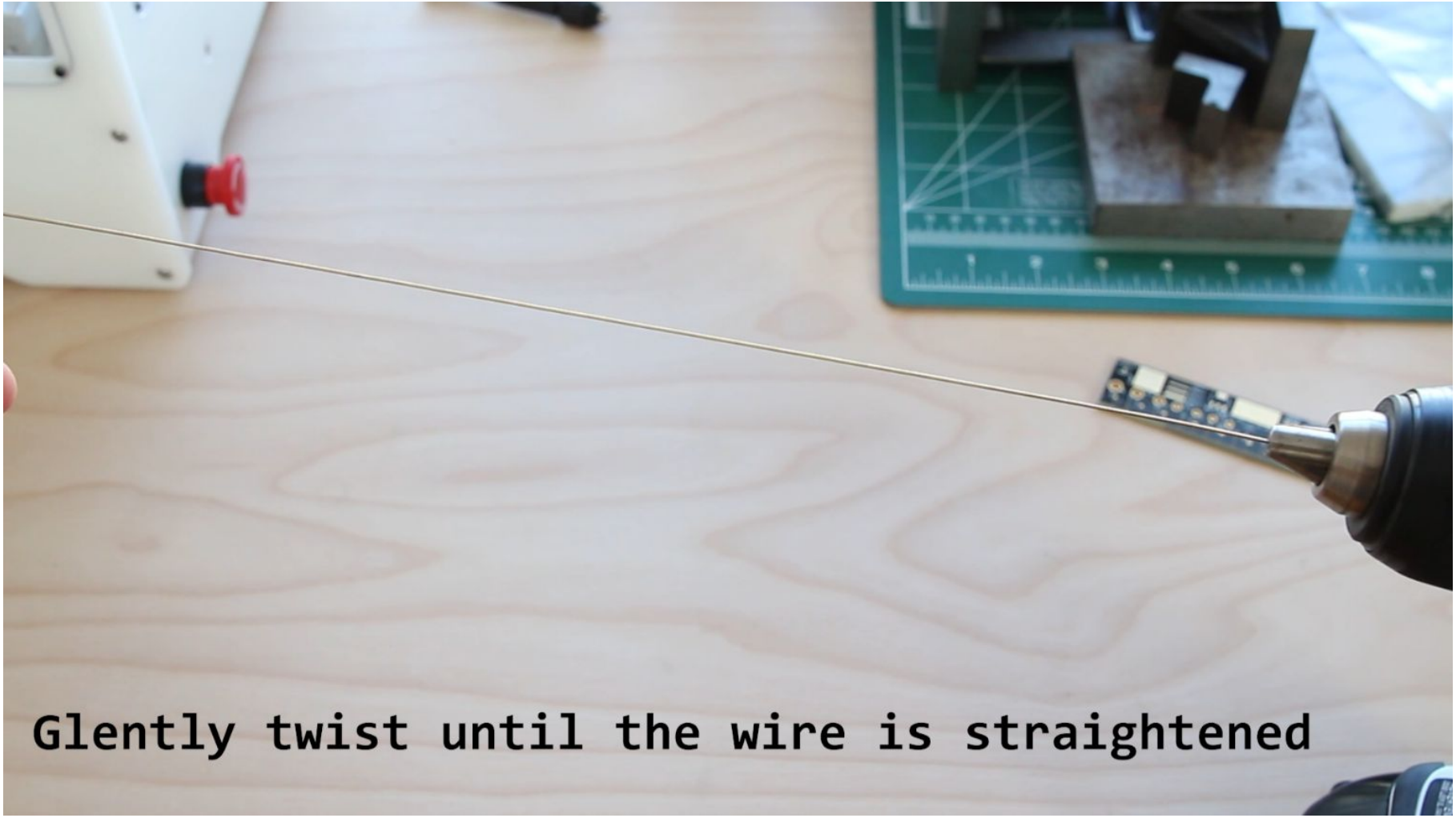


Mohit Bhoite



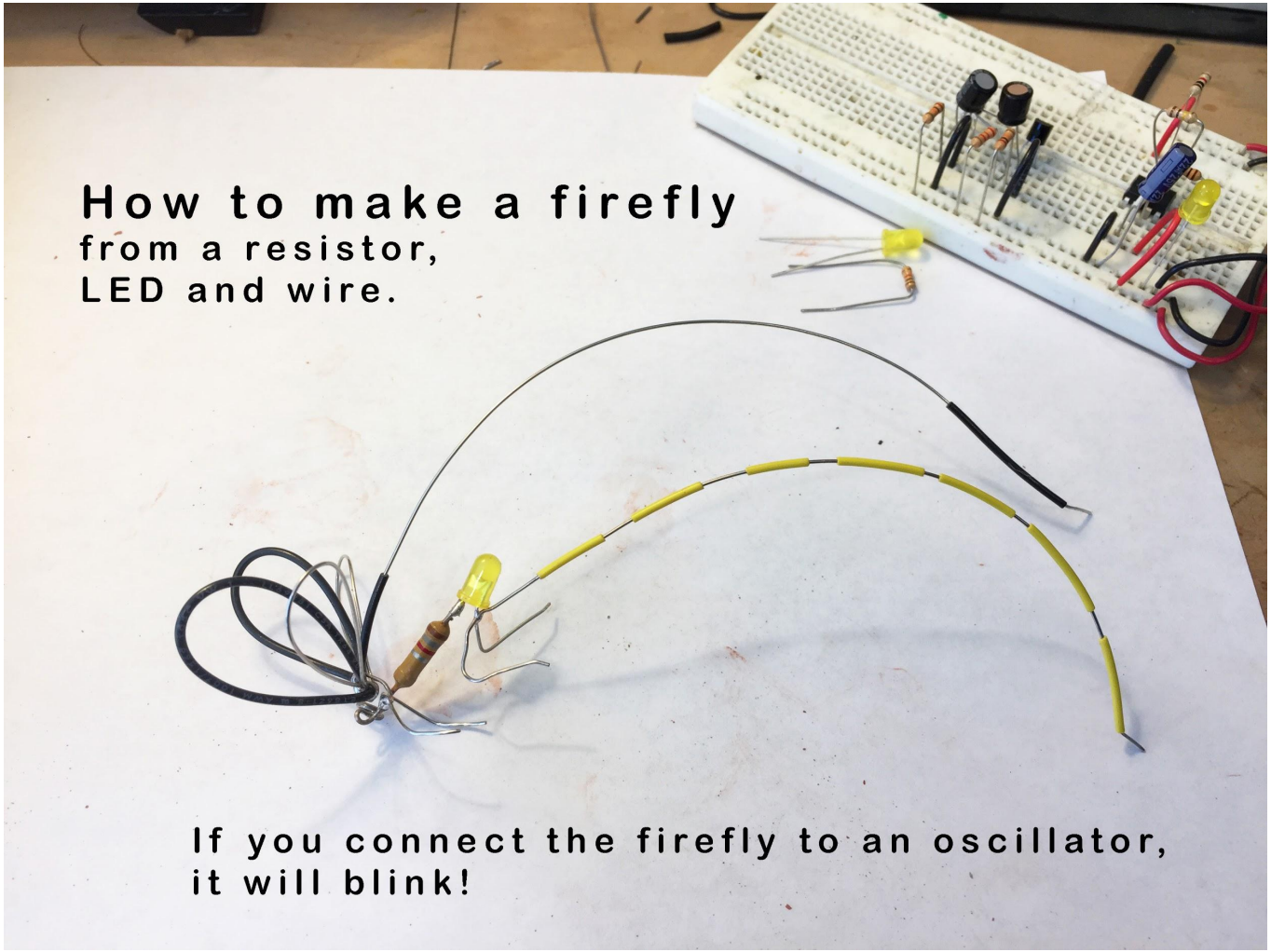
Mohit Bhoite


Feed it into the drill chuck


Glently twist until the wire is straightened

TODAY’S CIRCUIT SCULPTURE

FREE-FORMING A FIREFLY



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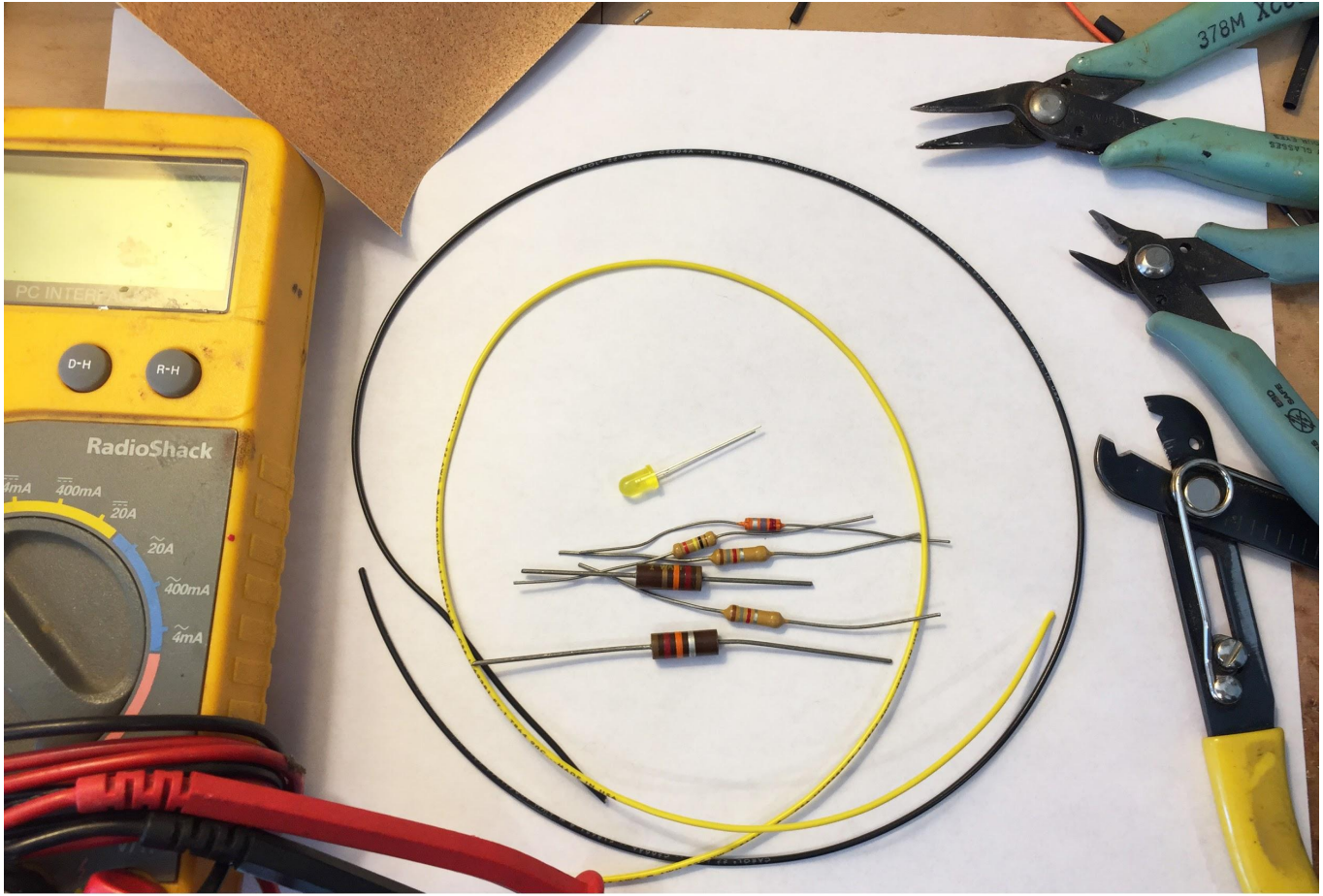
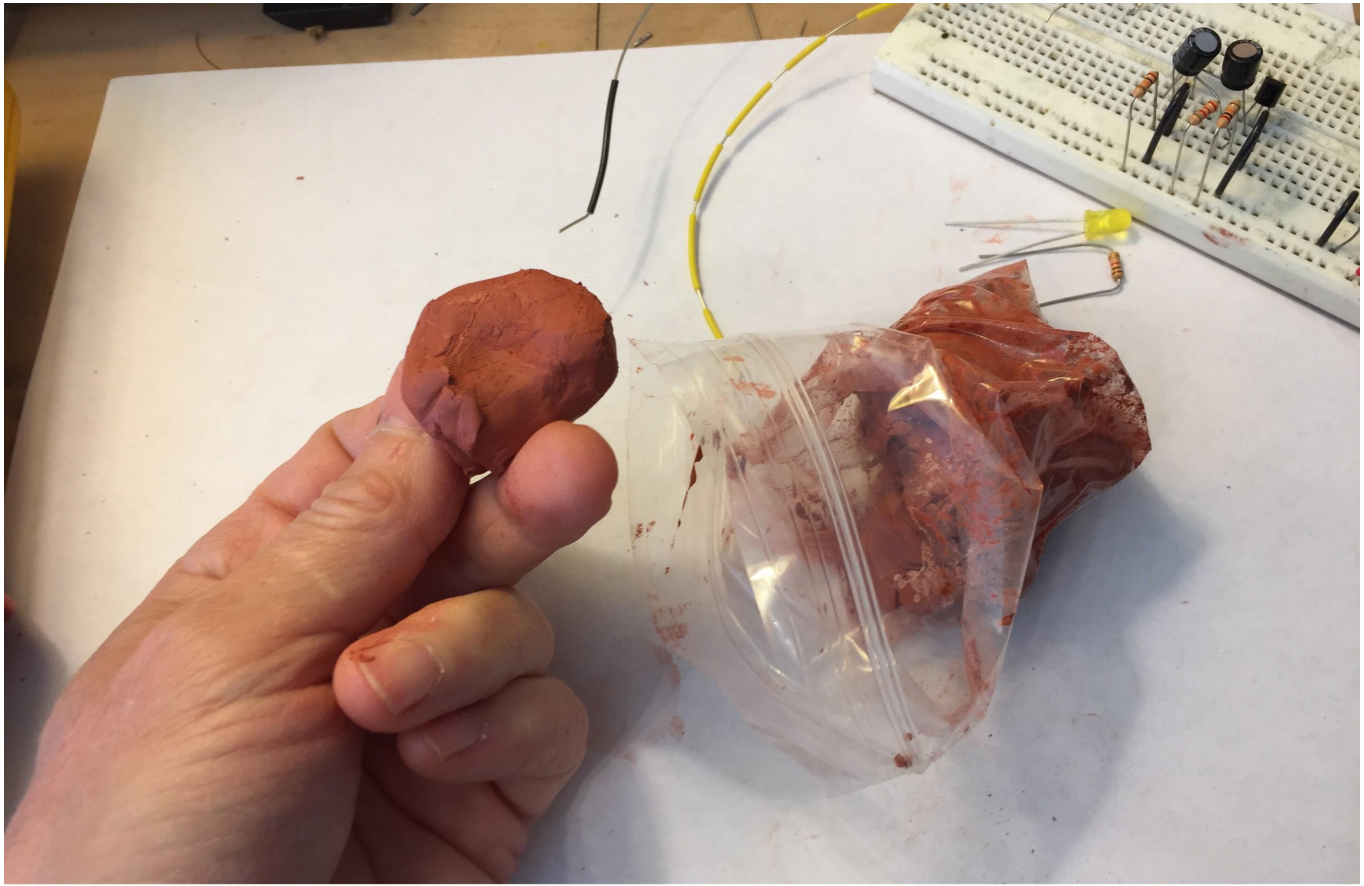


What you need (++ solder, iron, clay, breadboard...)

Kelly Heaton, 2020

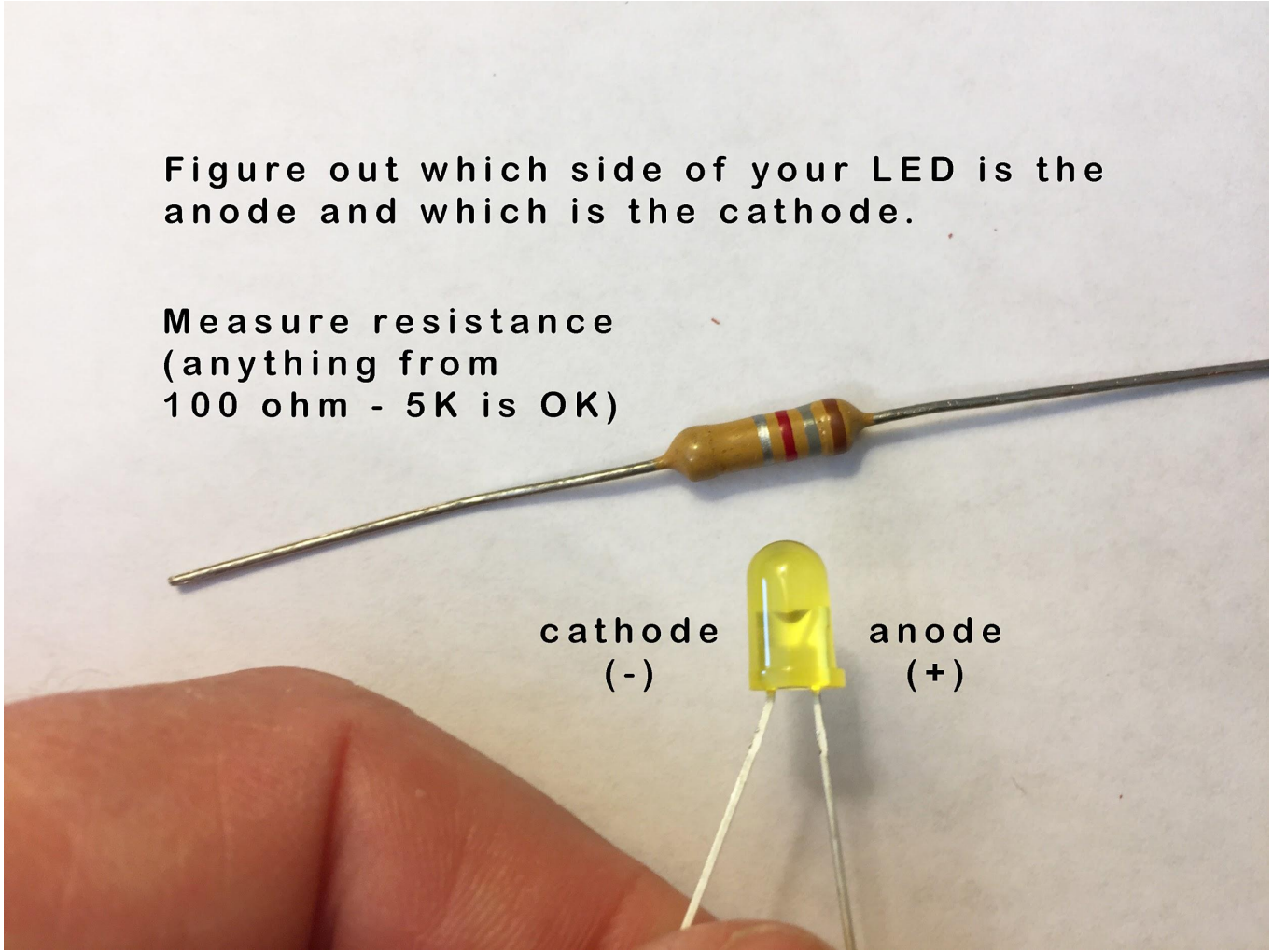
Random electronic parts are great for sculpture

Kelly Heaton, 2020

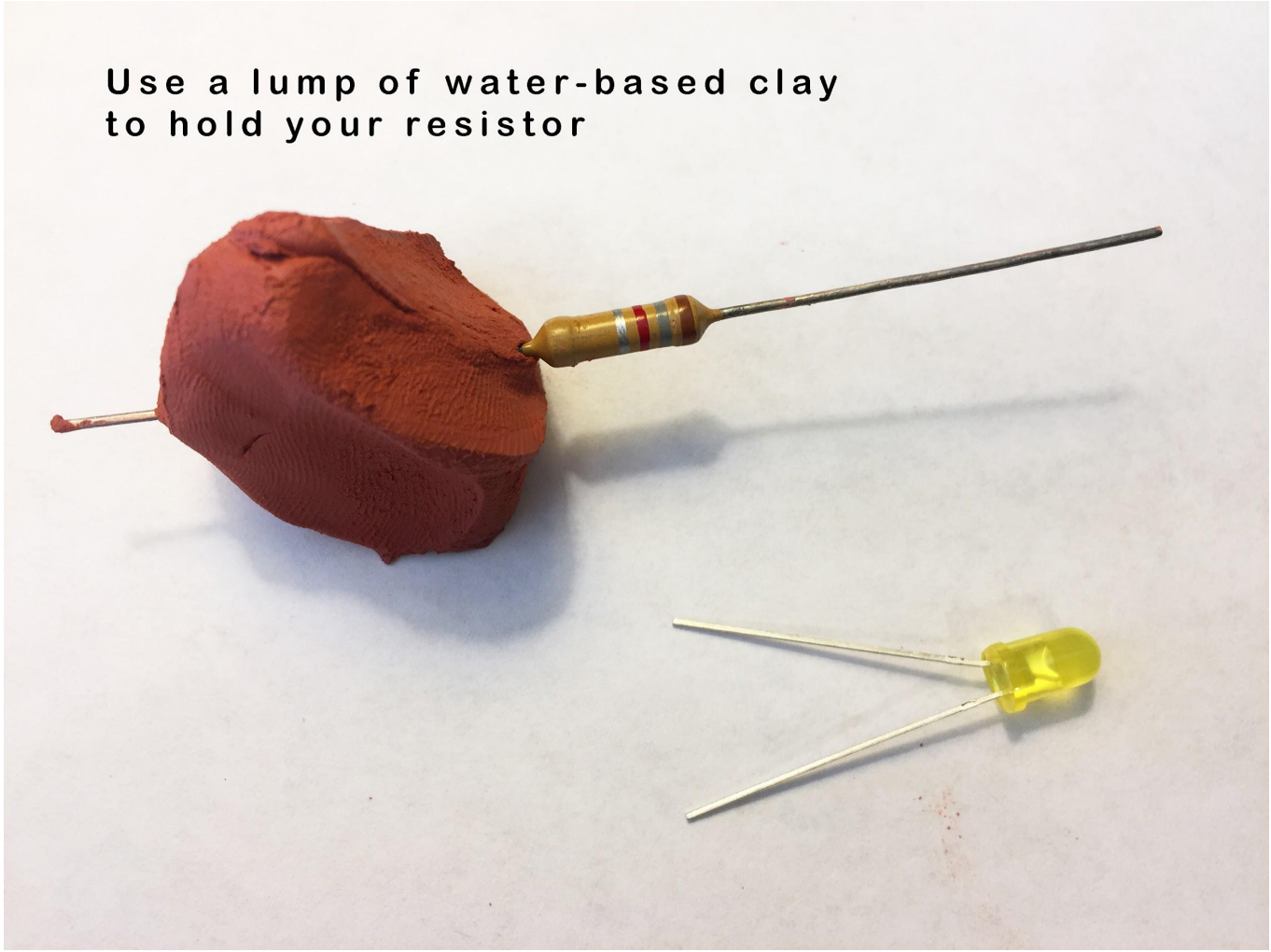


Water-based clay makes easy, versatile jigs

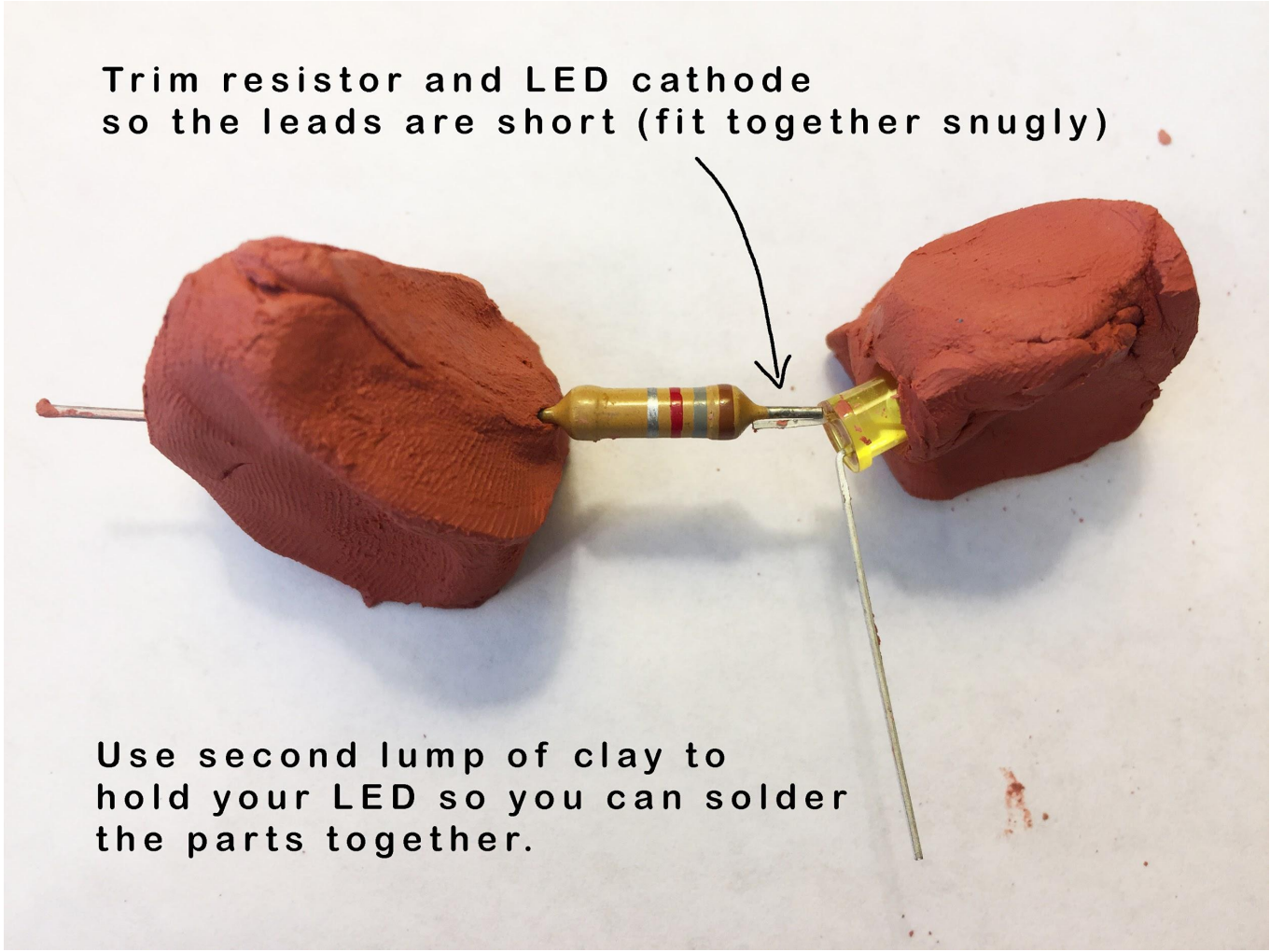
Kelly Heaton, 2020



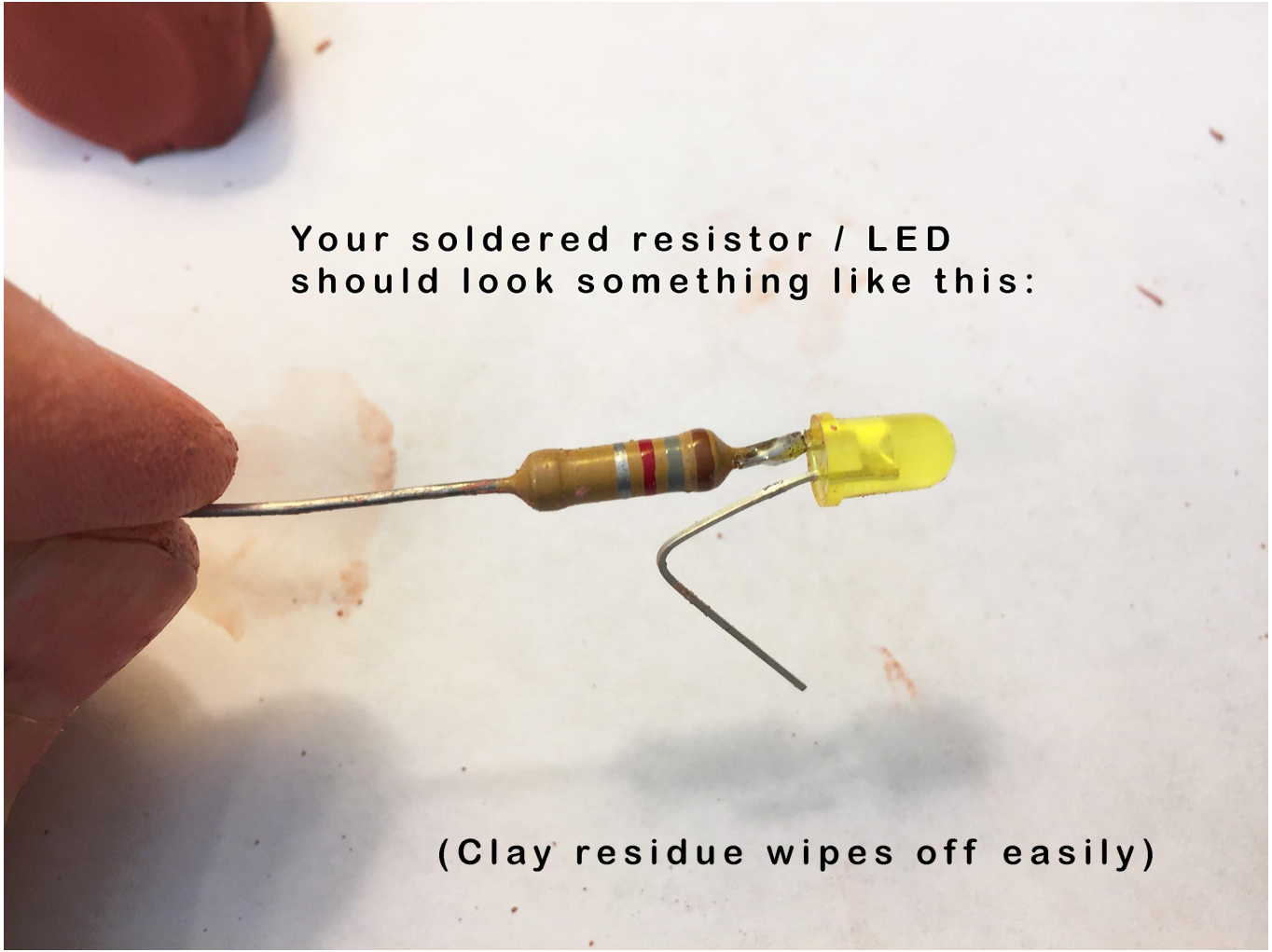
Kelly Heaton, 2020



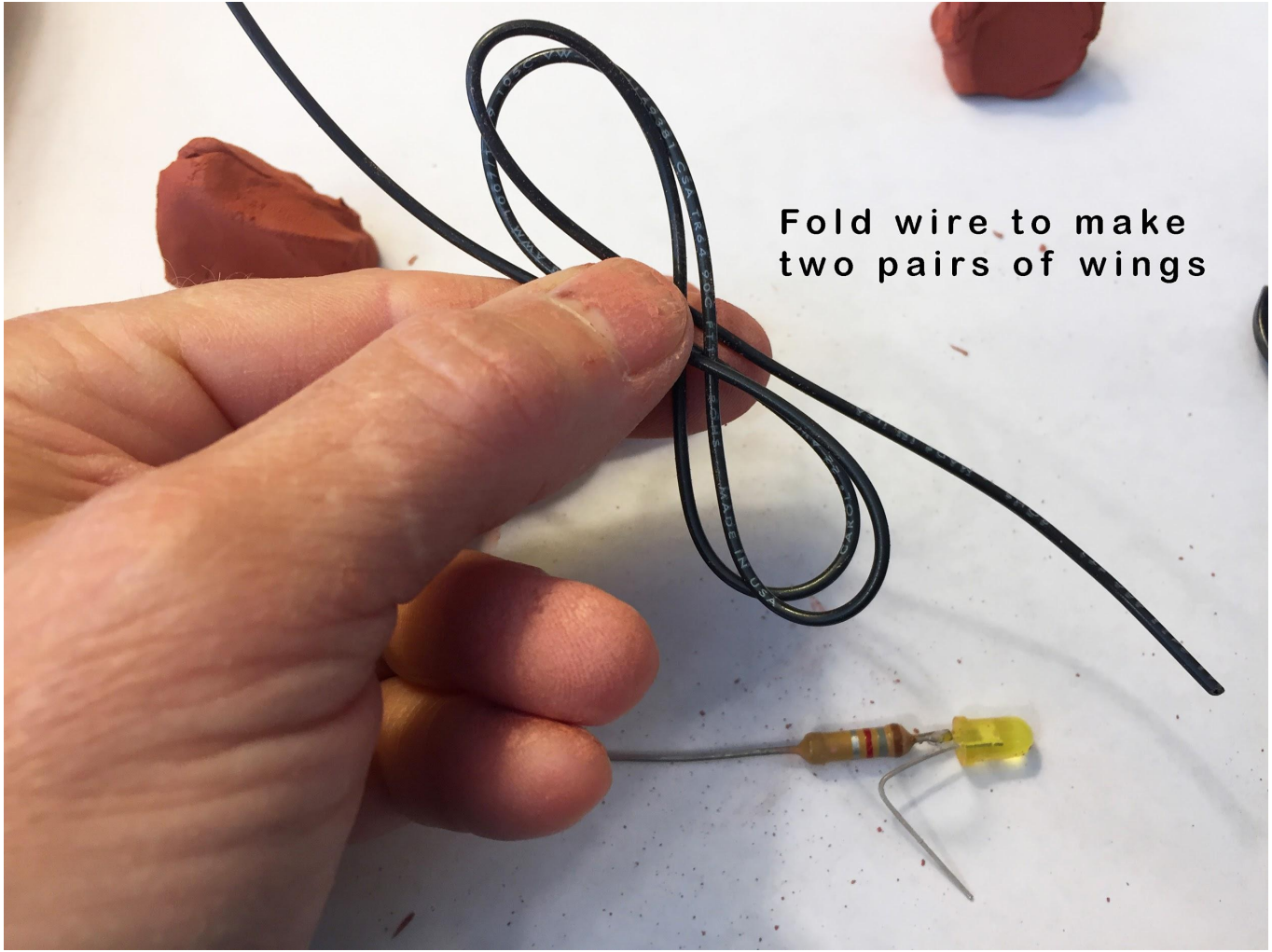
Kelly Heaton, 2020



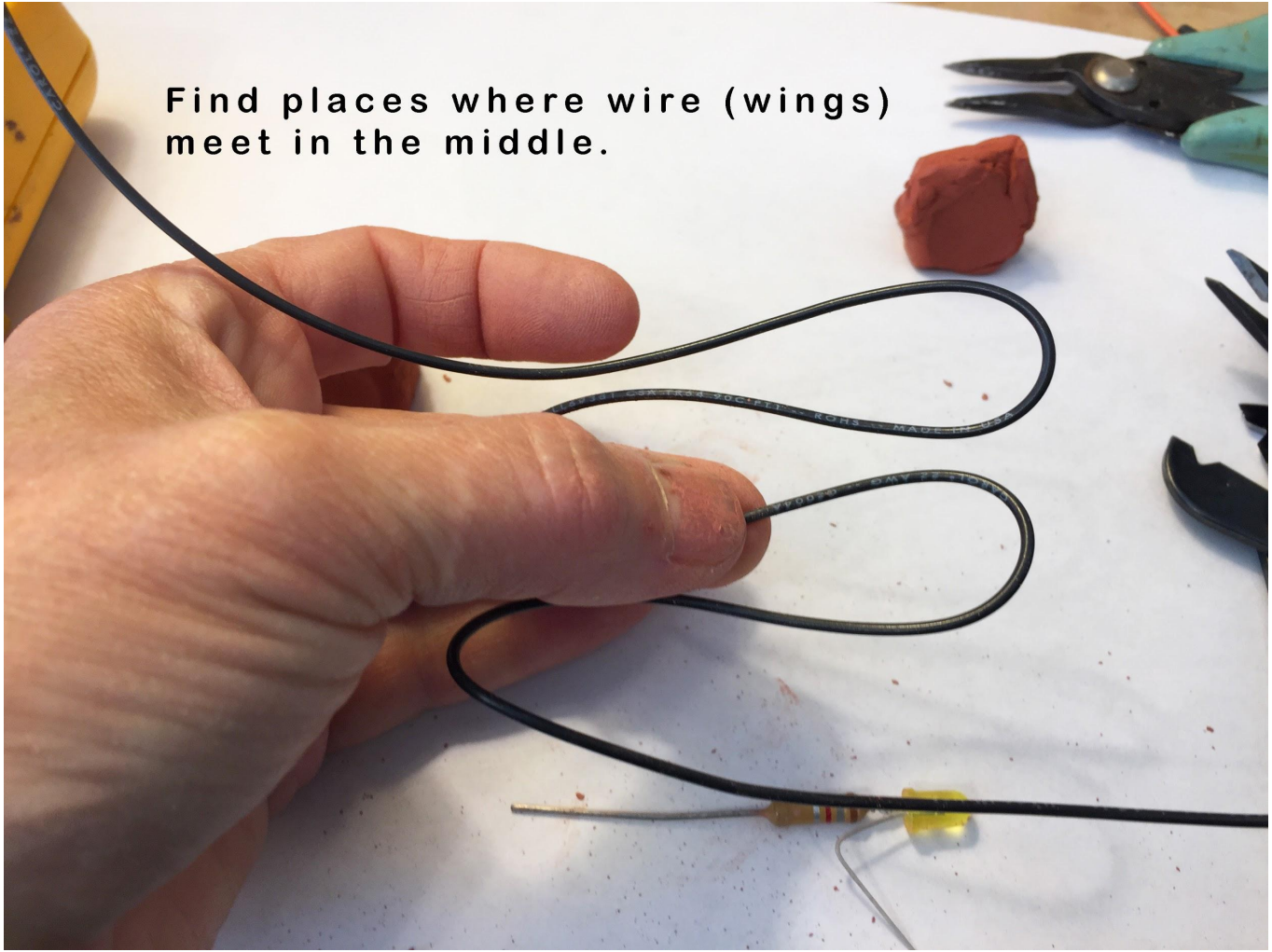
Kelly Heaton, 2020



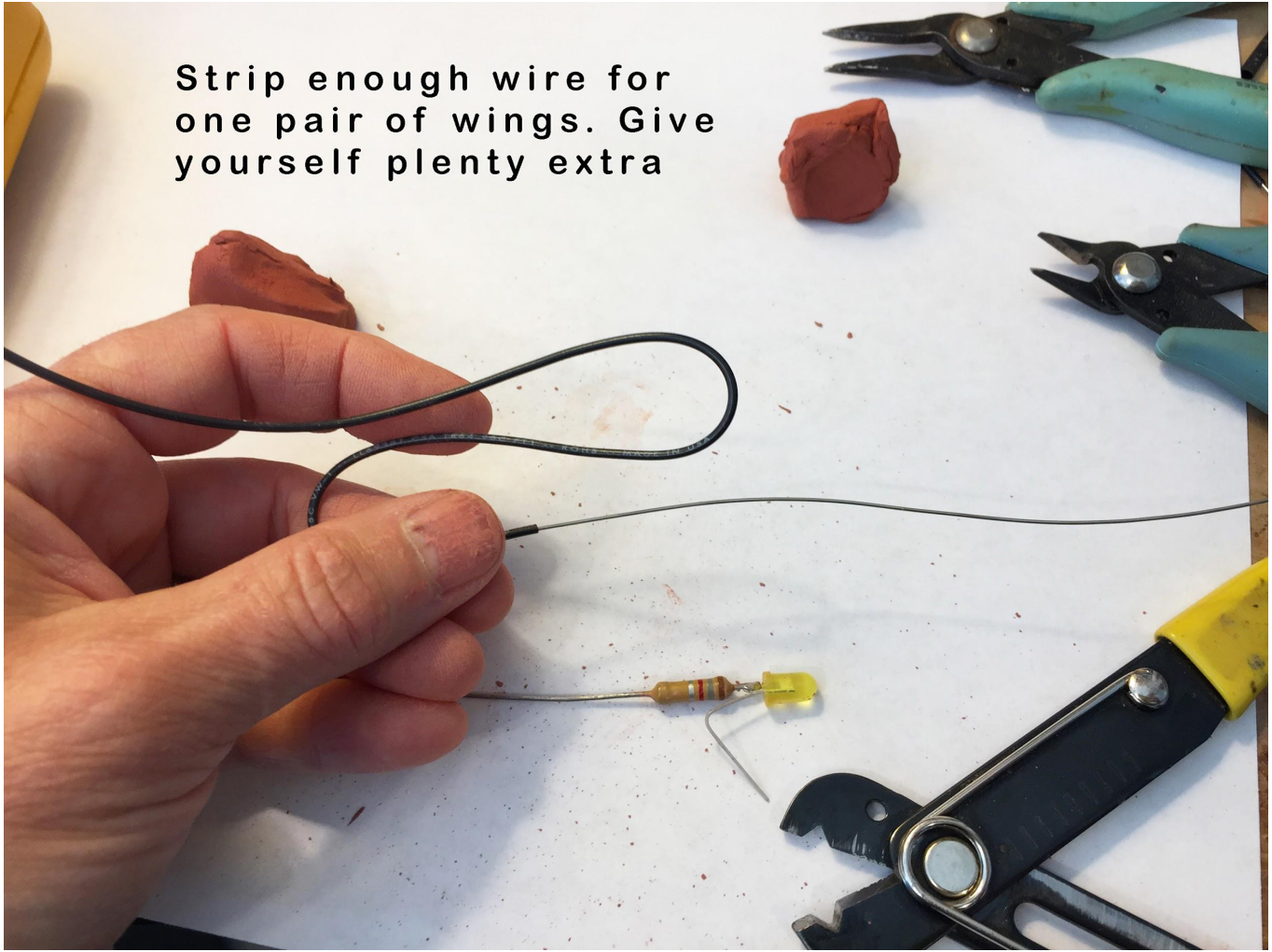
Kelly Heaton, 2020



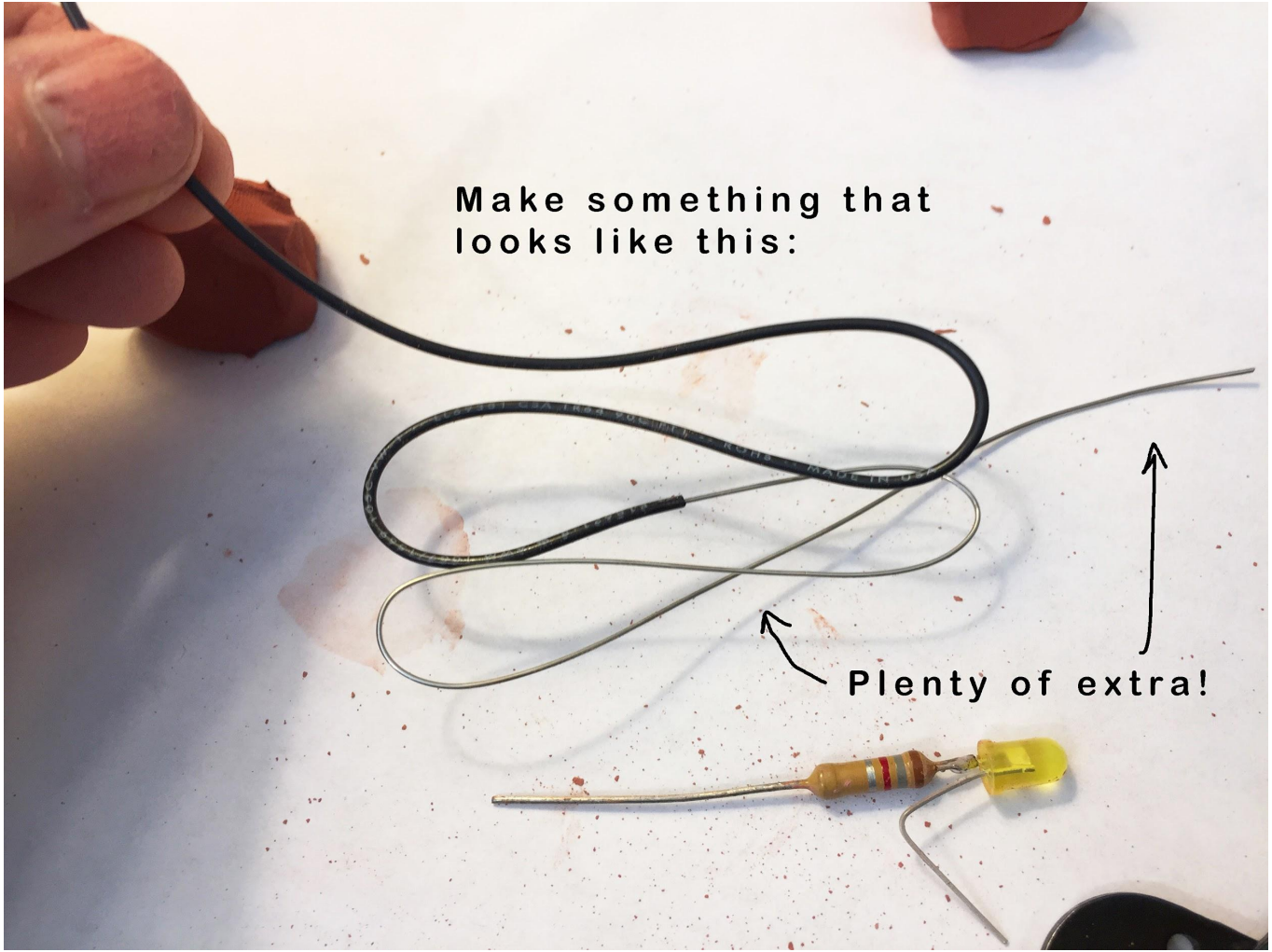
Kelly Heaton, 2020



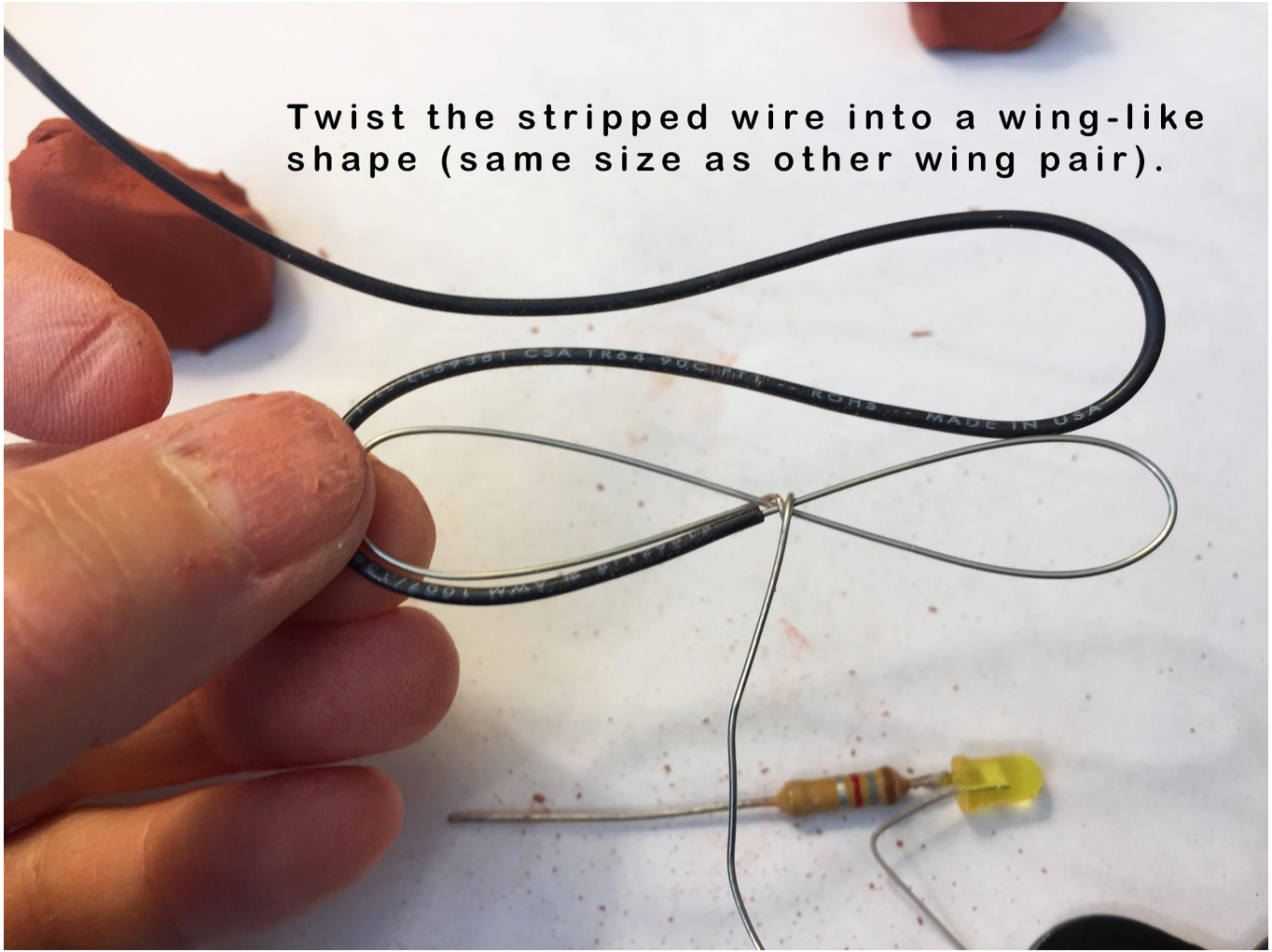
Kelly Heaton, 2020



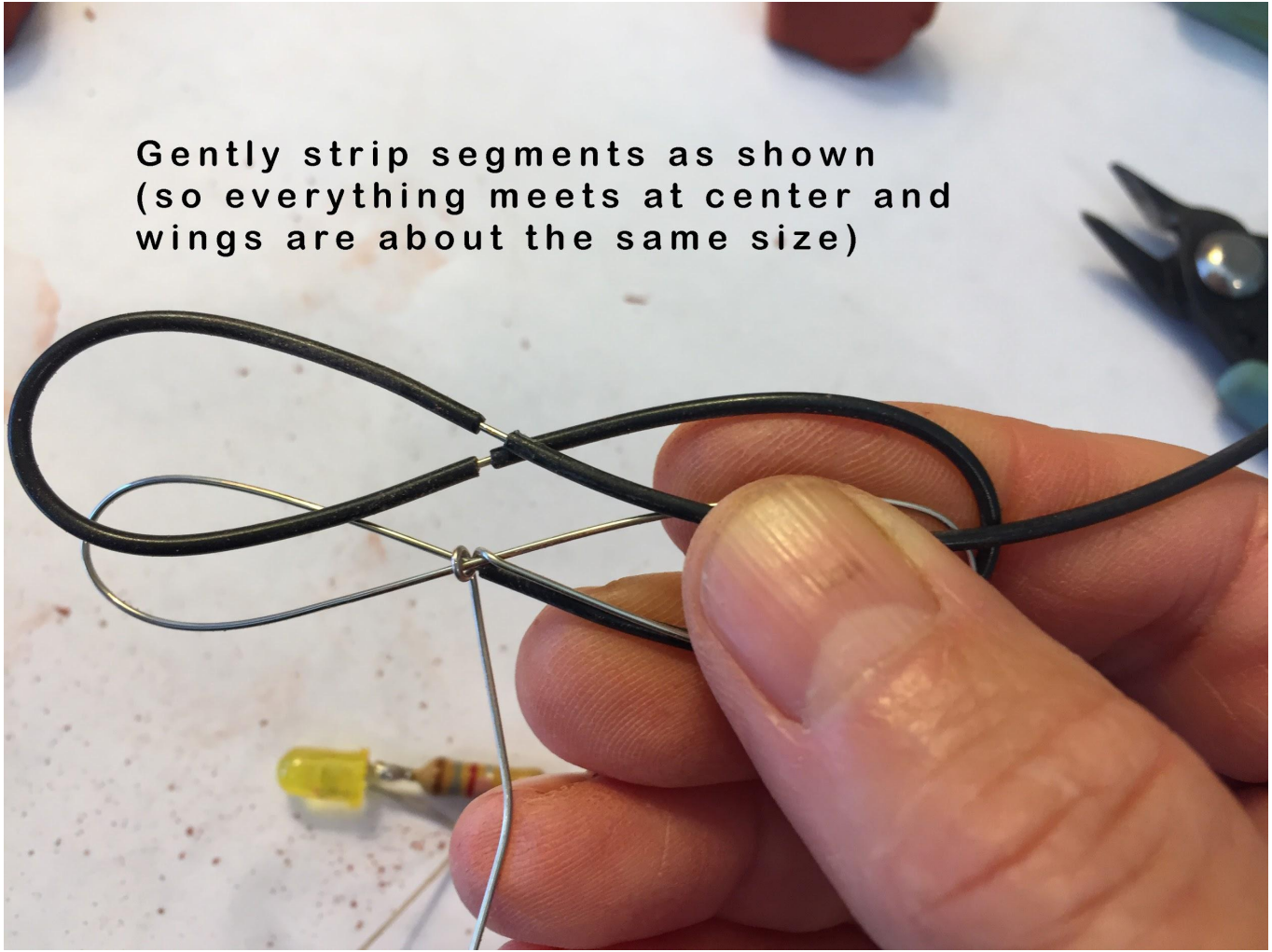
Kelly Heaton, 2020



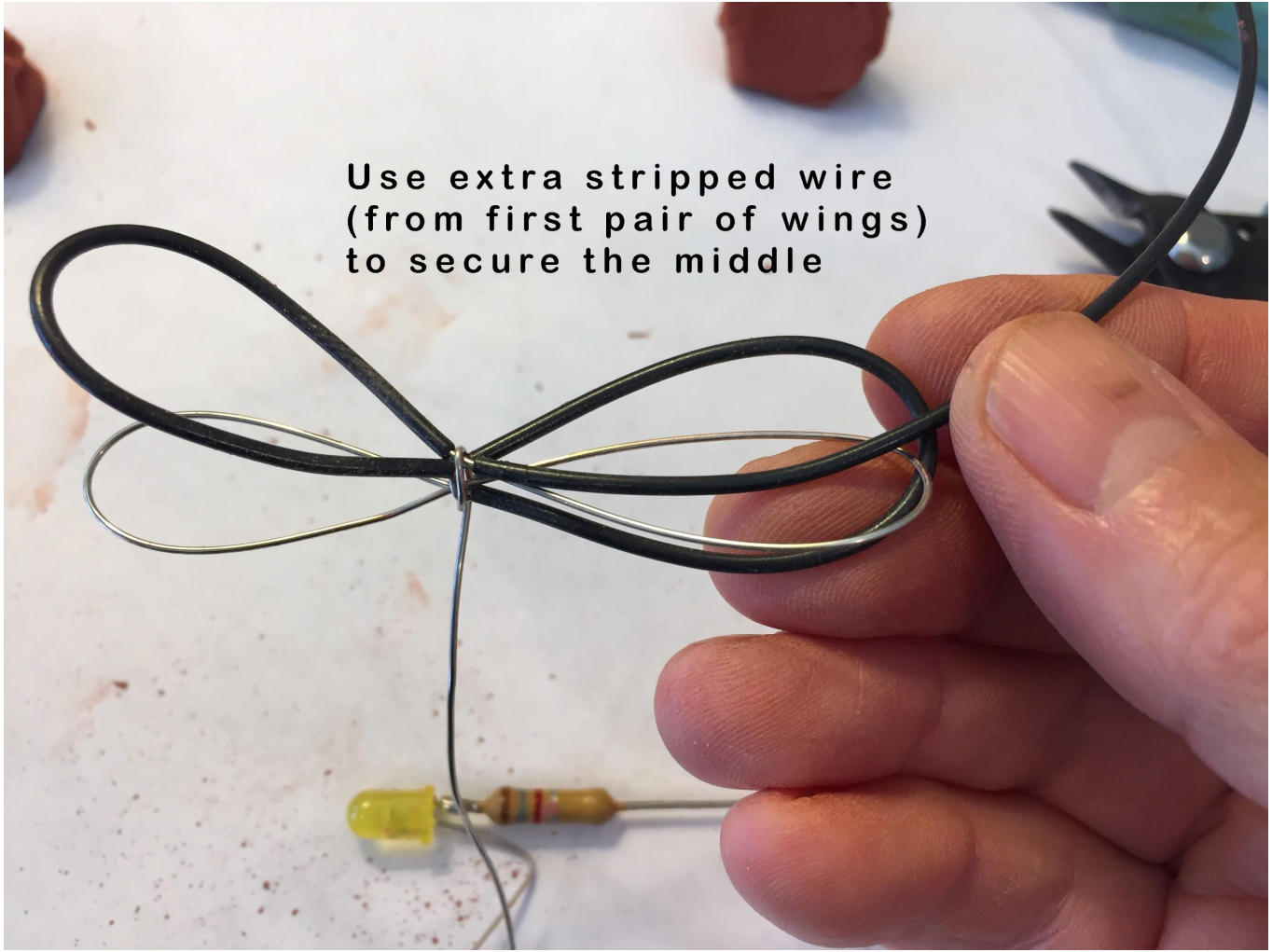
Kelly Heaton, 2020



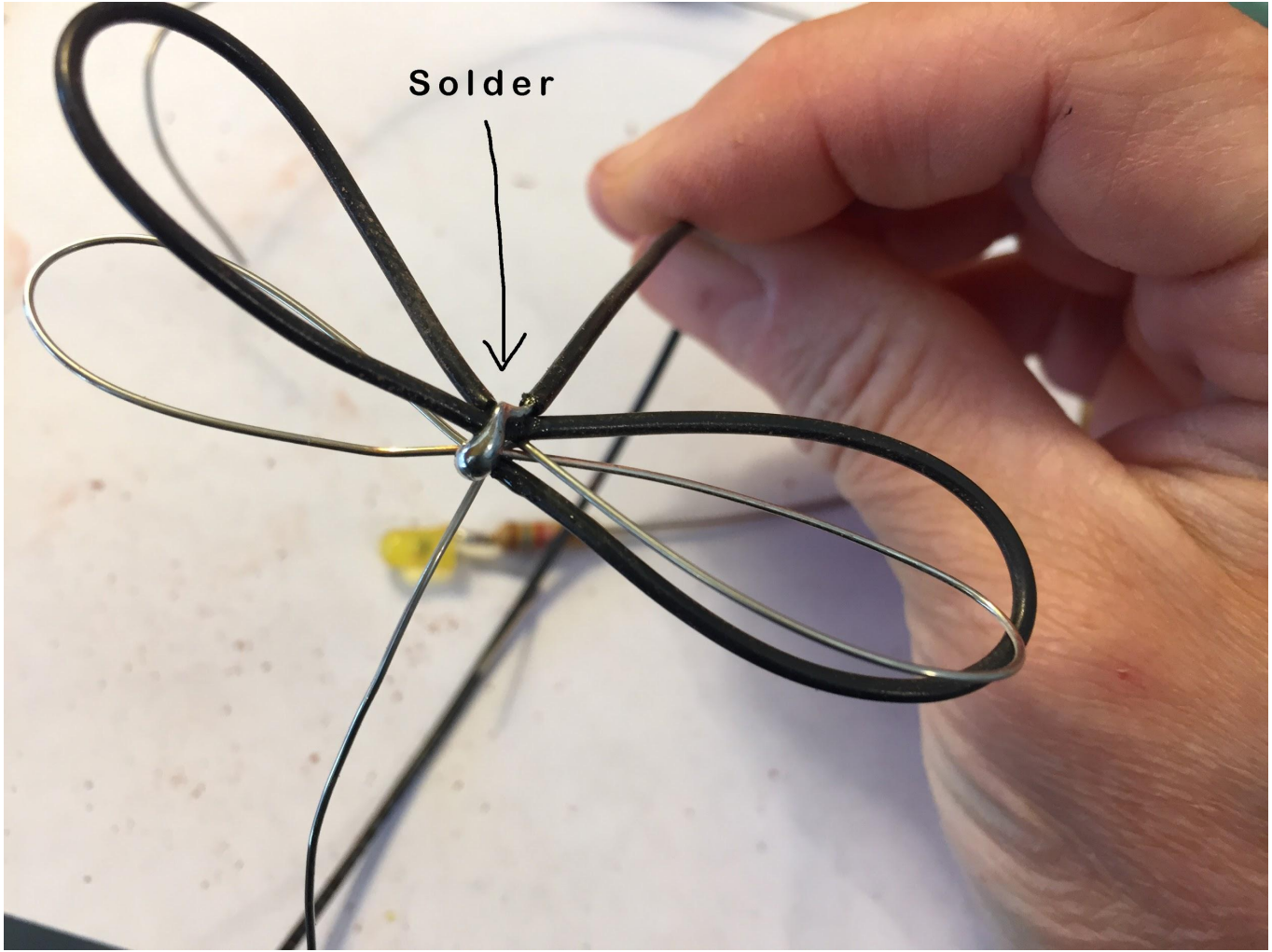
Kelly Heaton, 2020



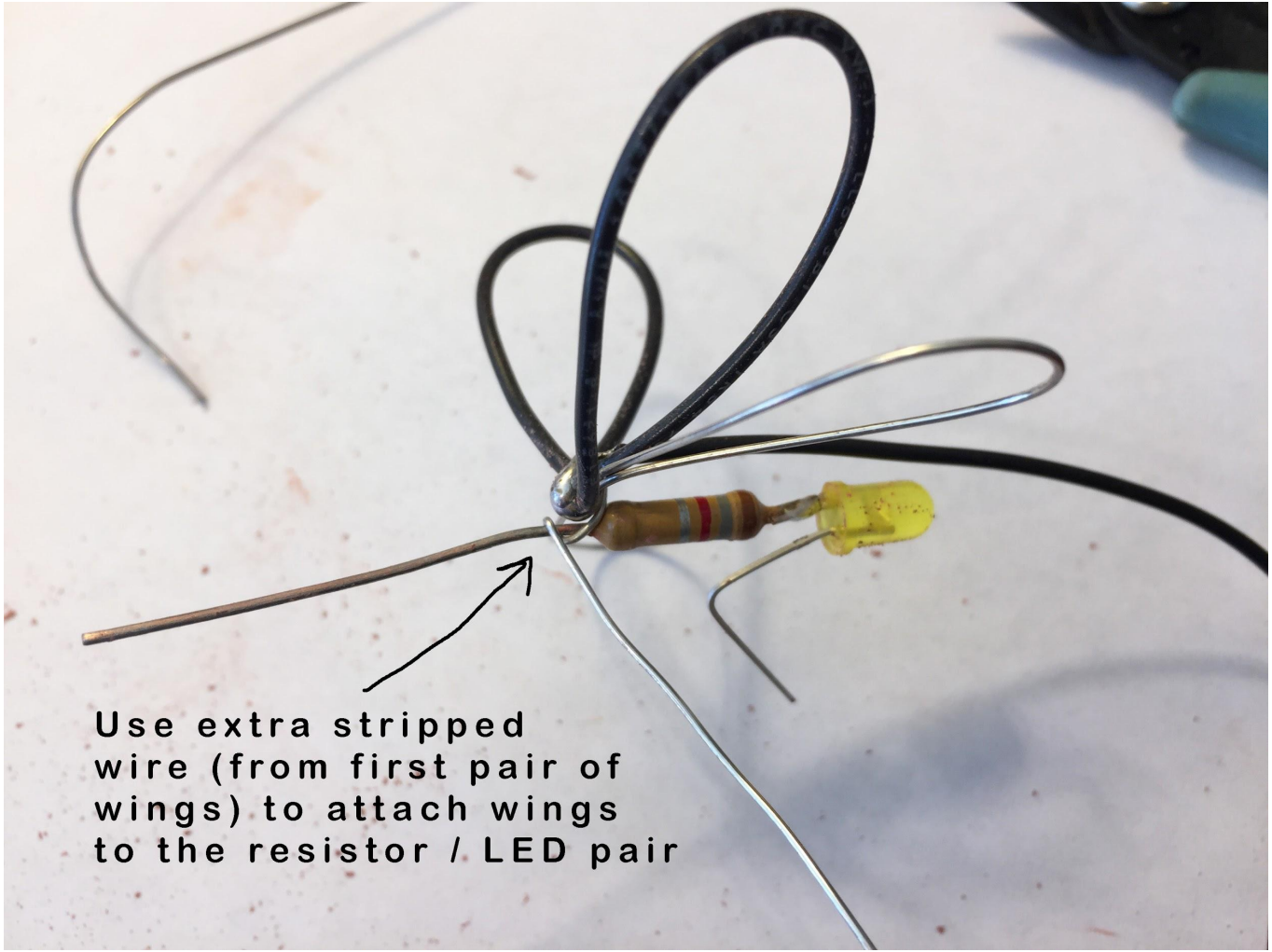
Kelly Heaton, 2020



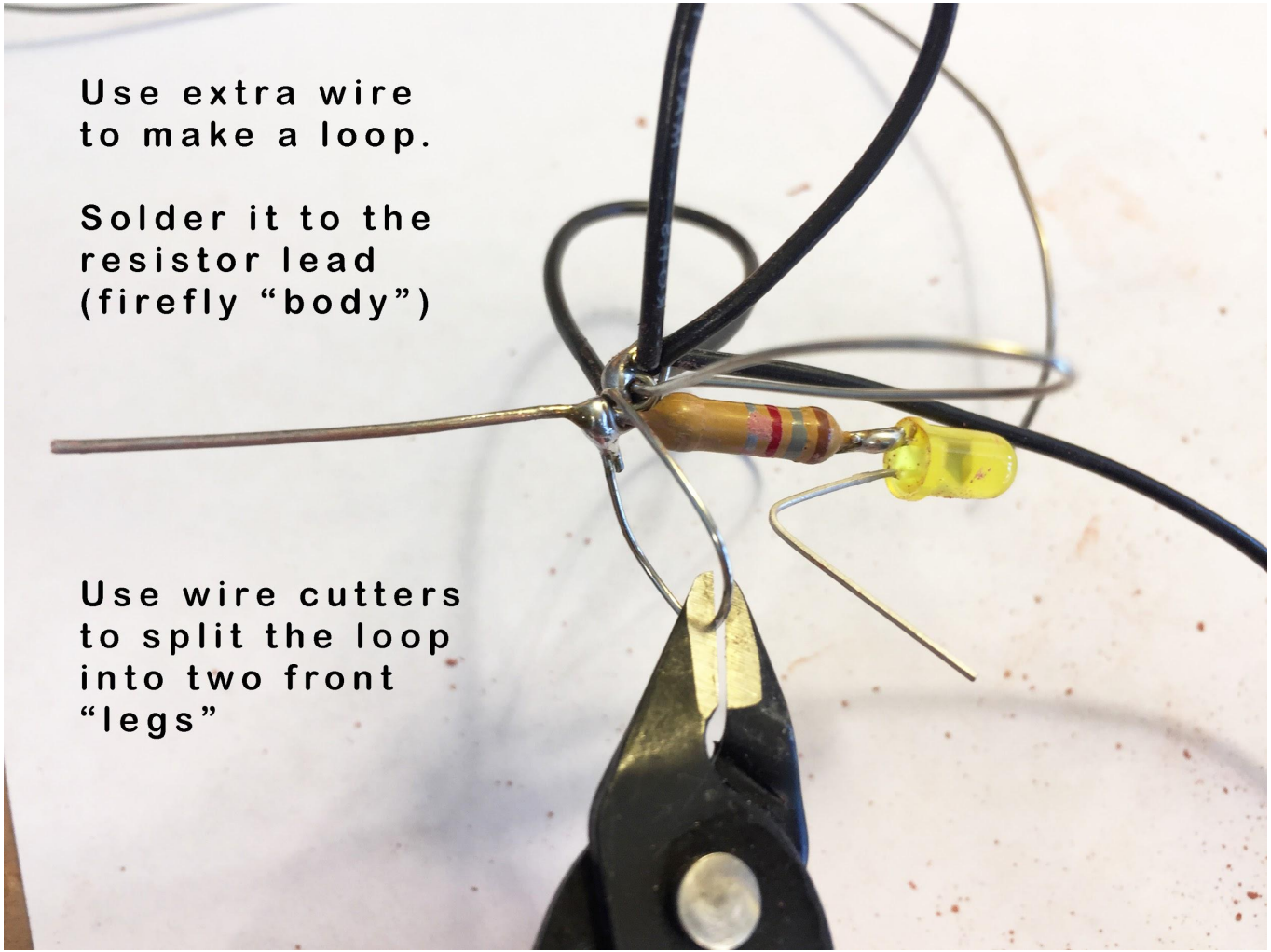
Kelly Heaton, 2020



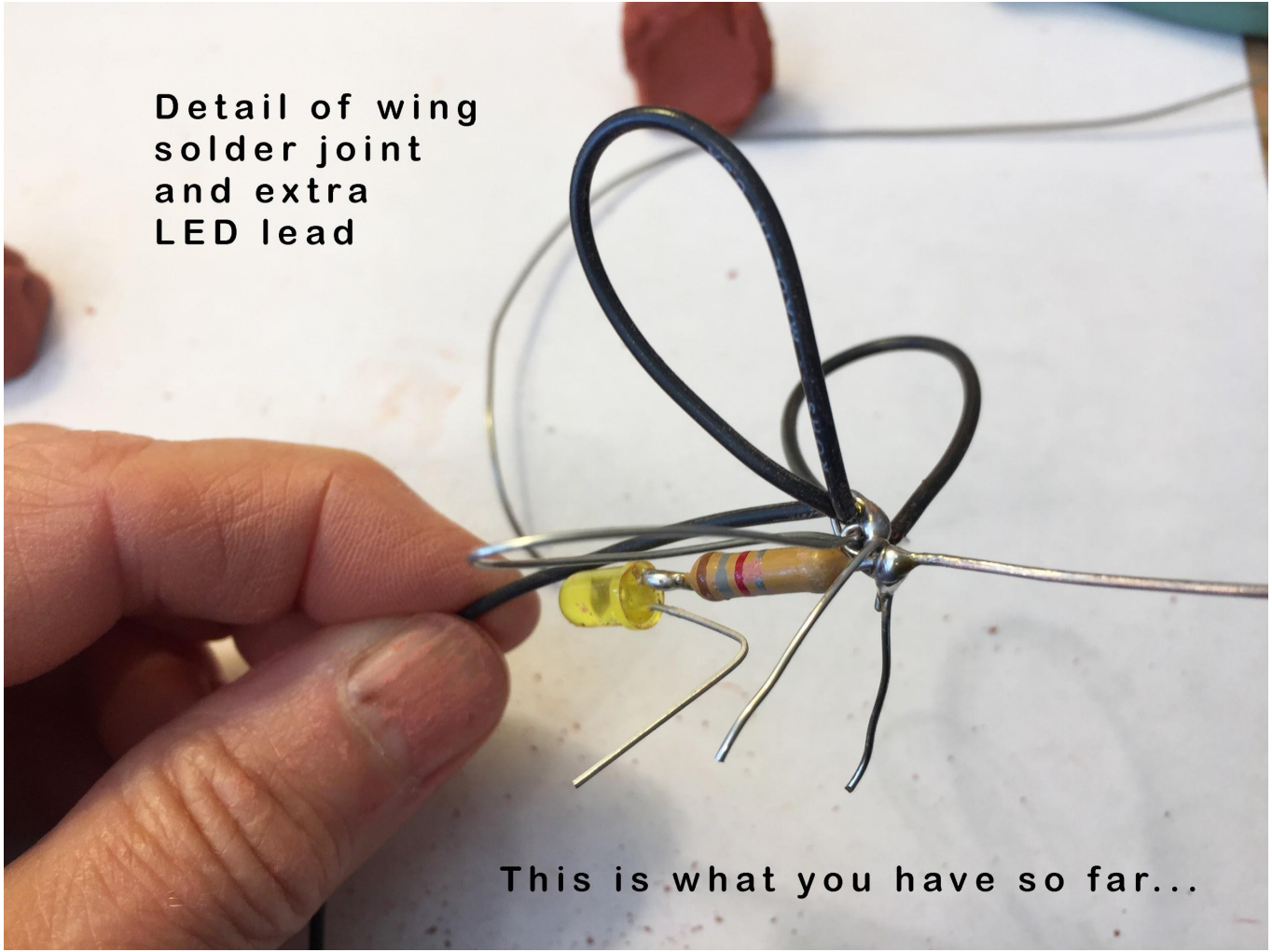
Kelly Heaton, 2020



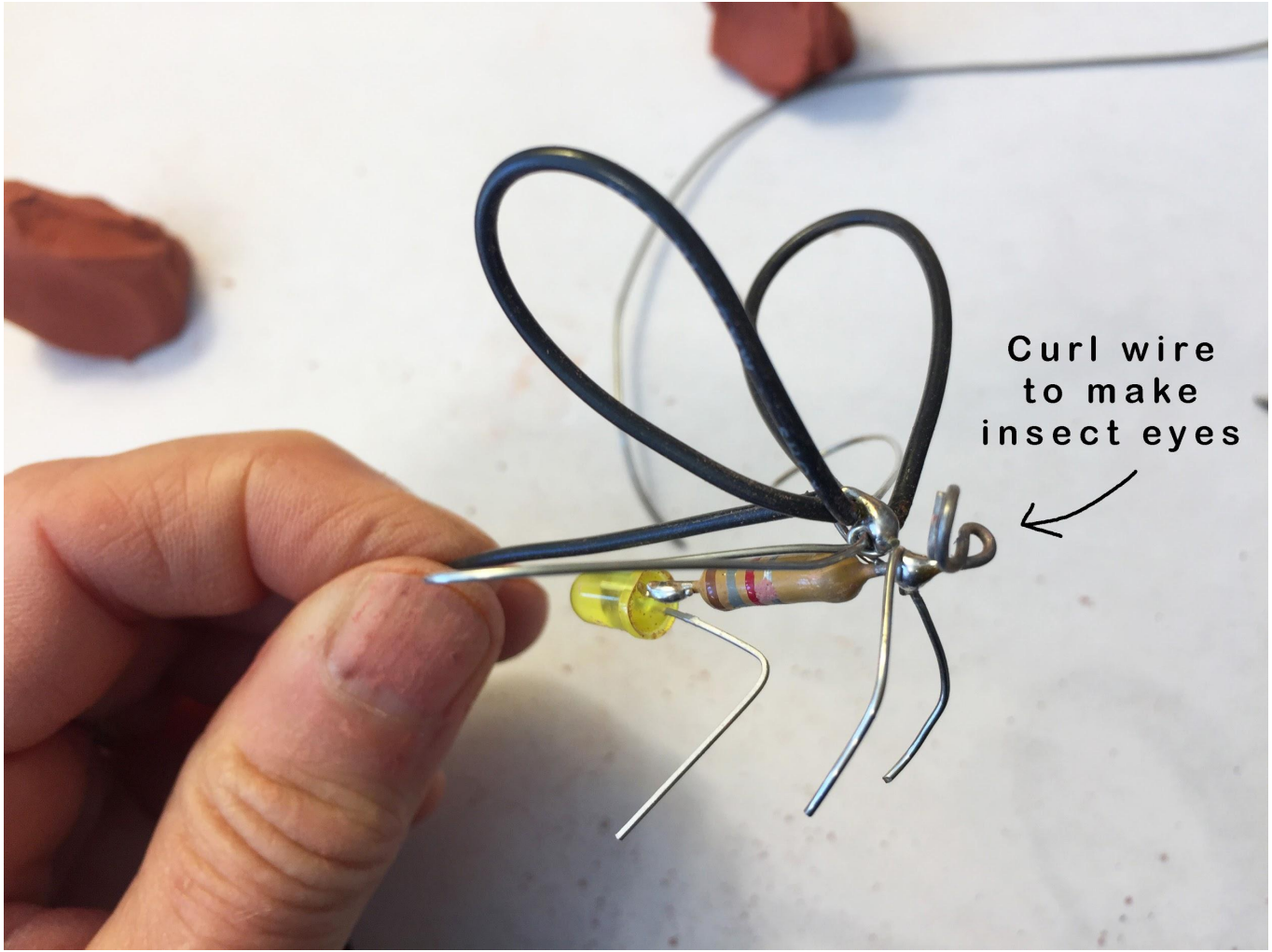
Kelly Heaton, 2020



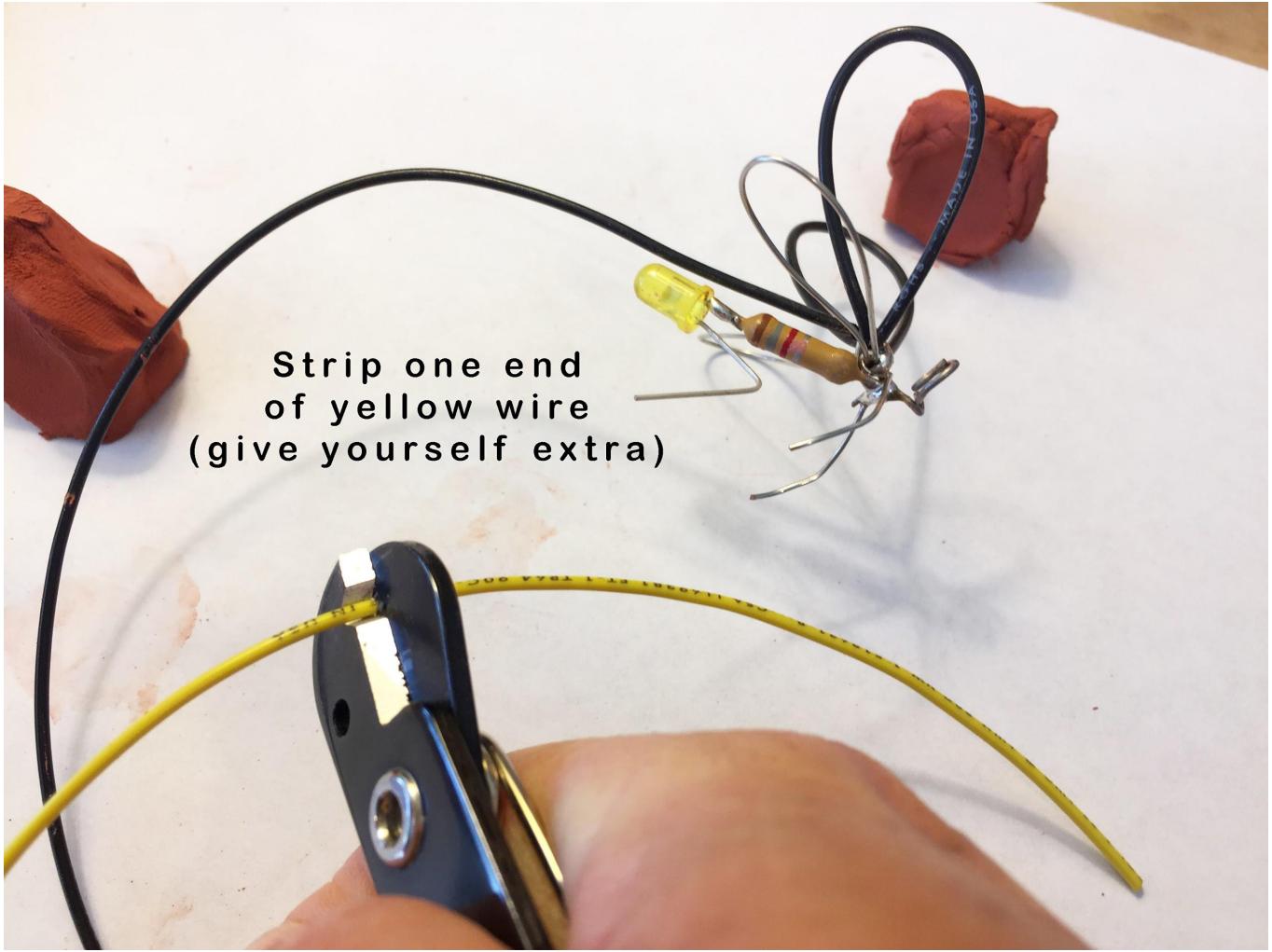
Kelly Heaton, 2020



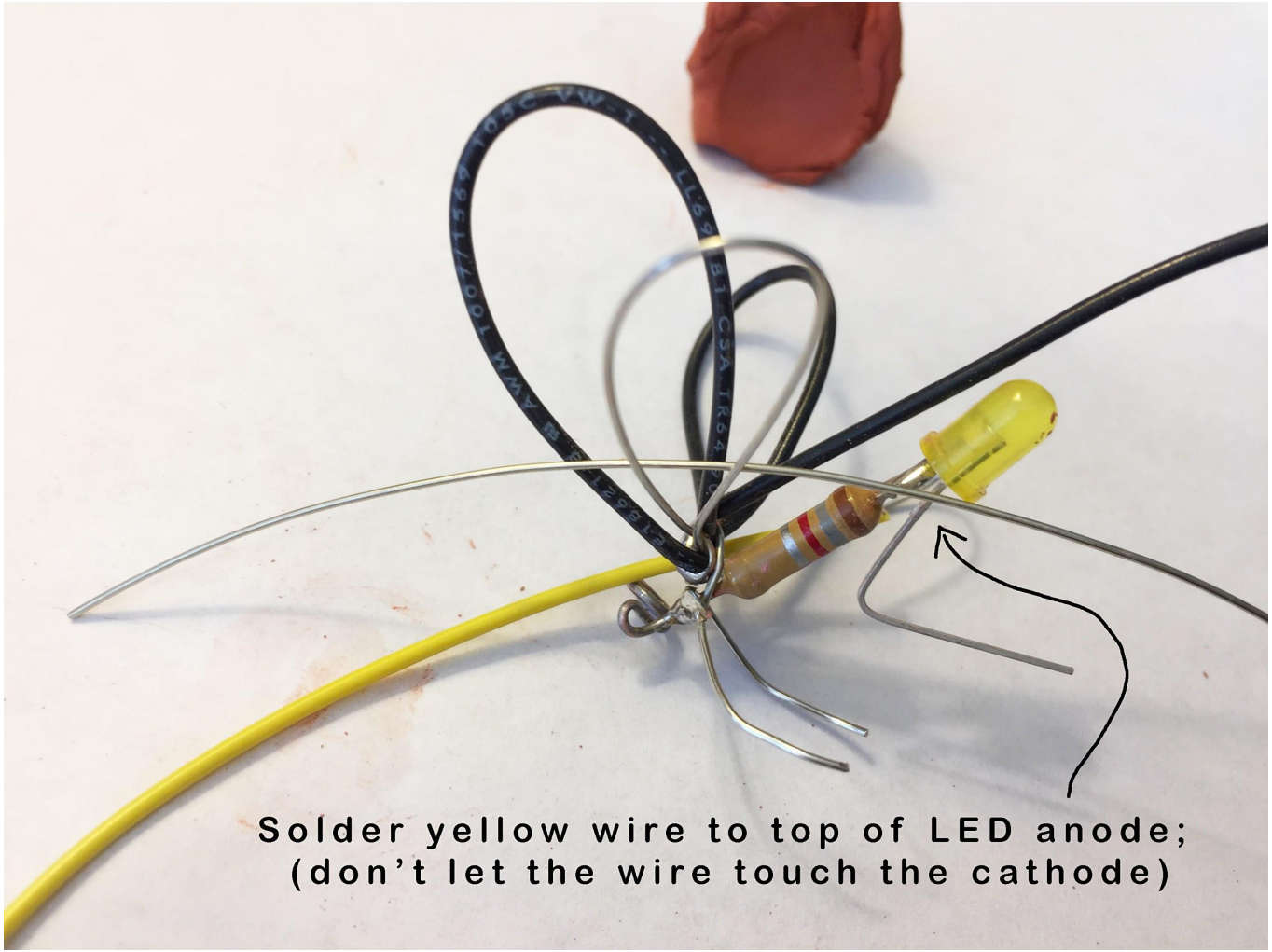
Kelly Heaton, 2020



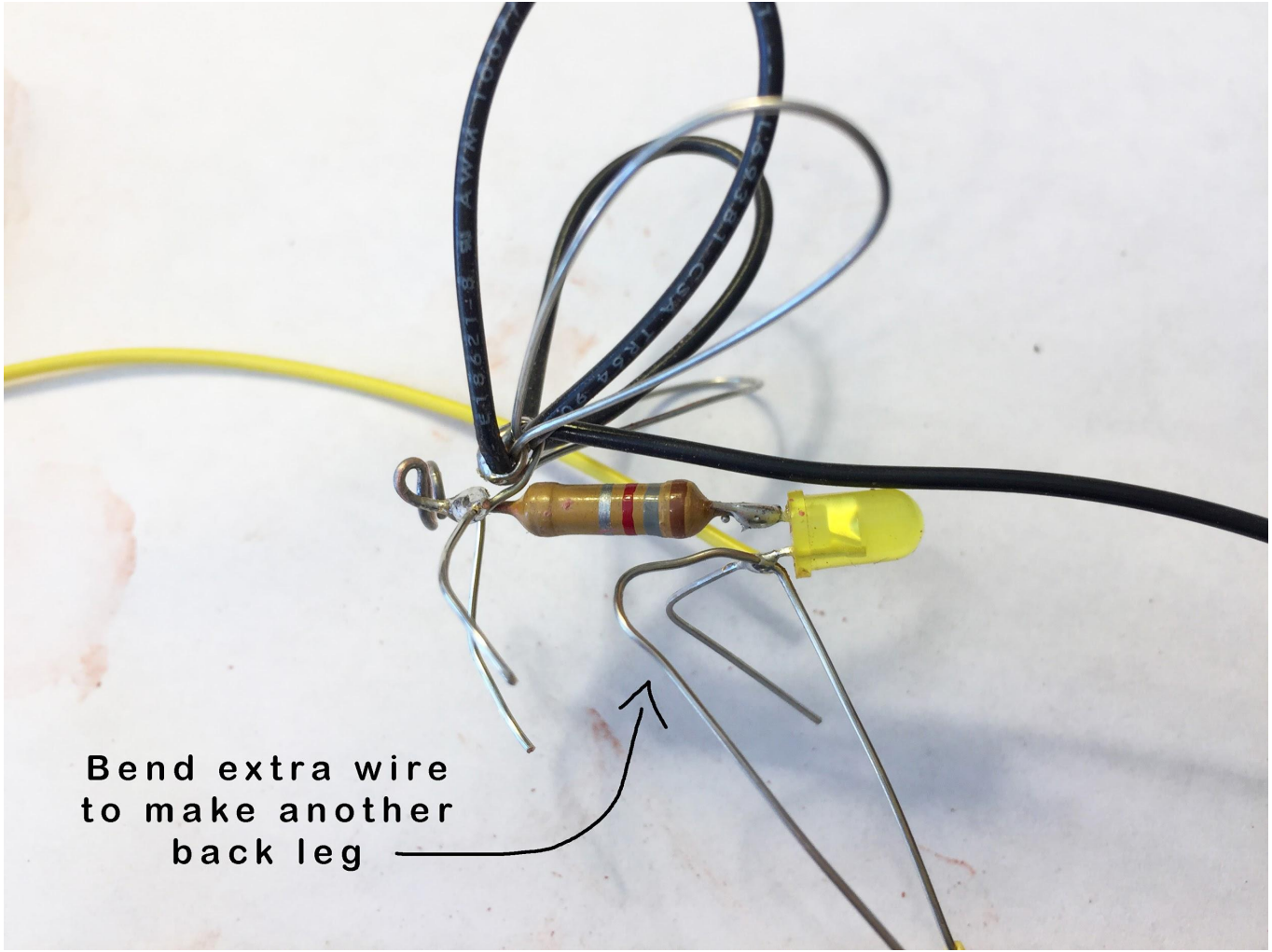
Kelly Heaton, 2020



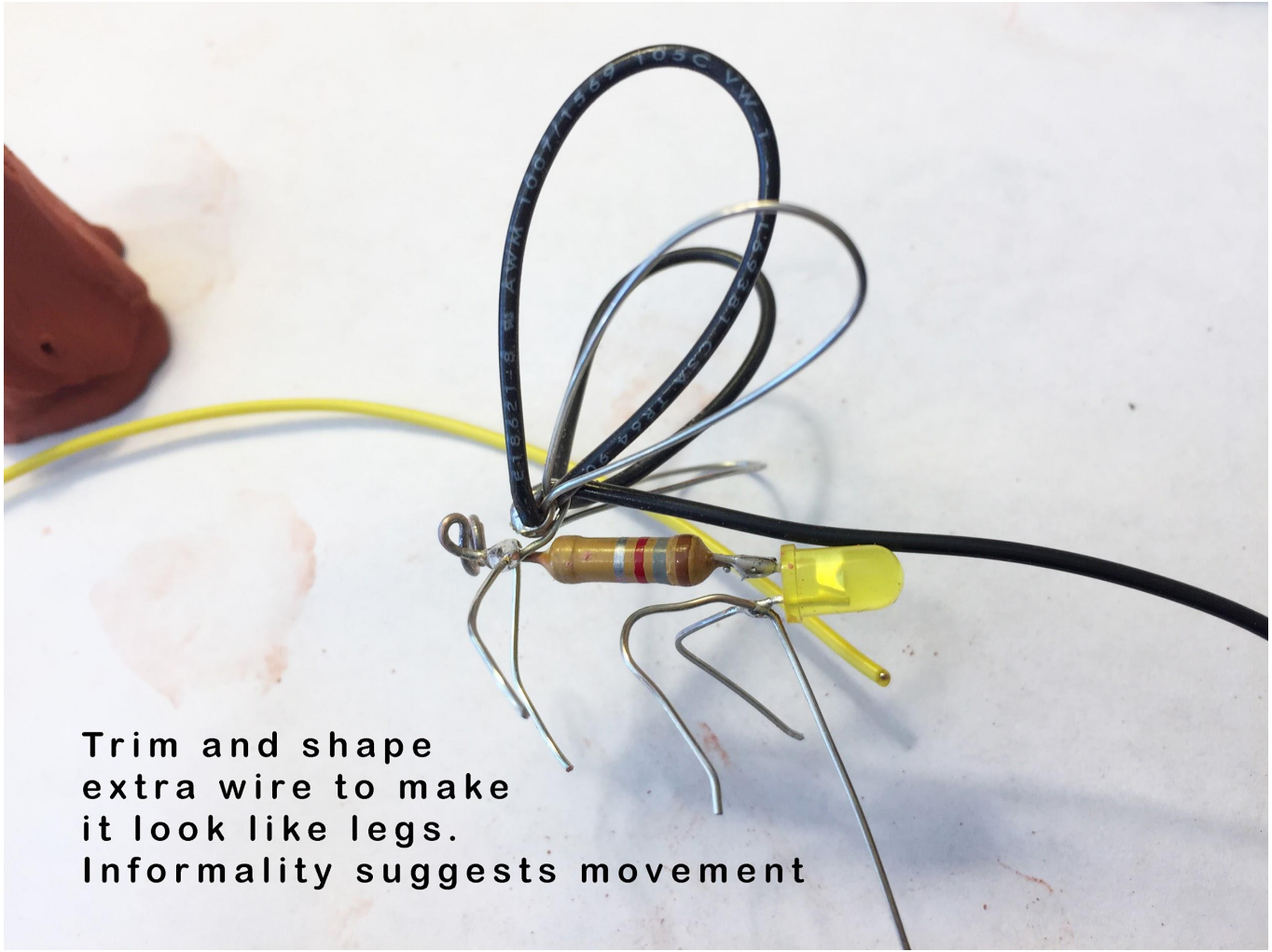
Kelly Heaton, 2020



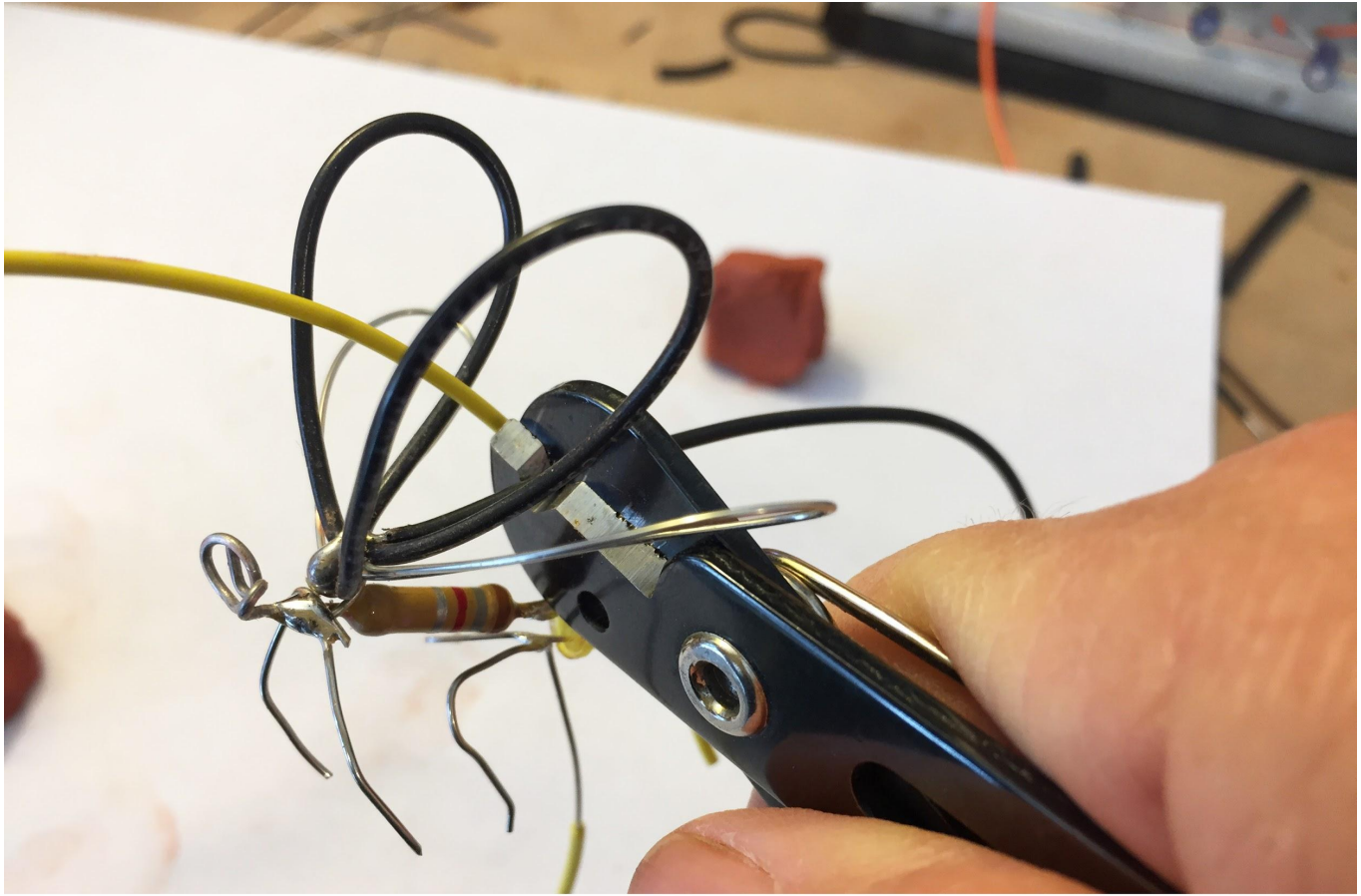
Kelly Heaton, 2020



Kelly Heaton, 2020

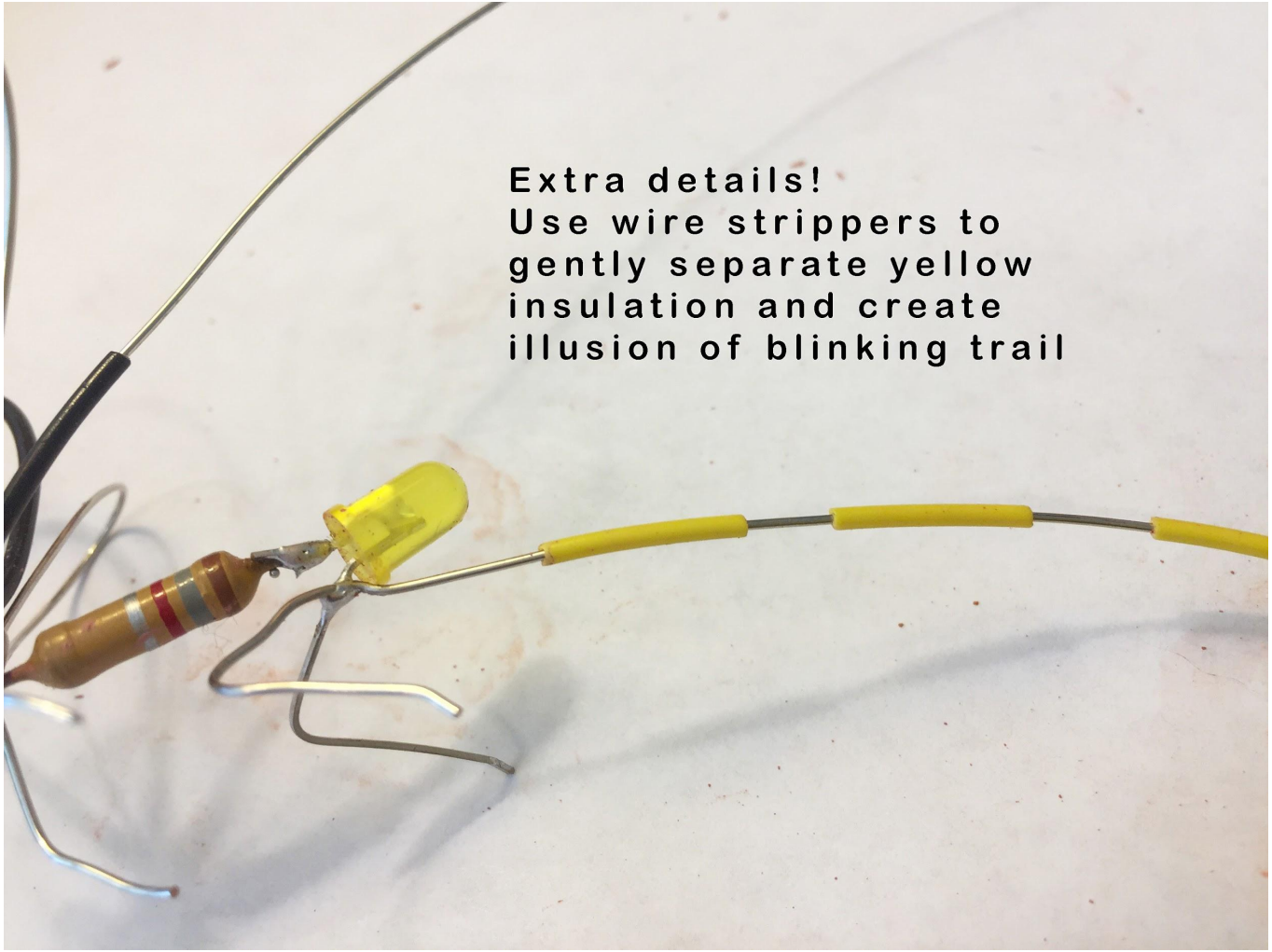


Kelly Heaton, 2020

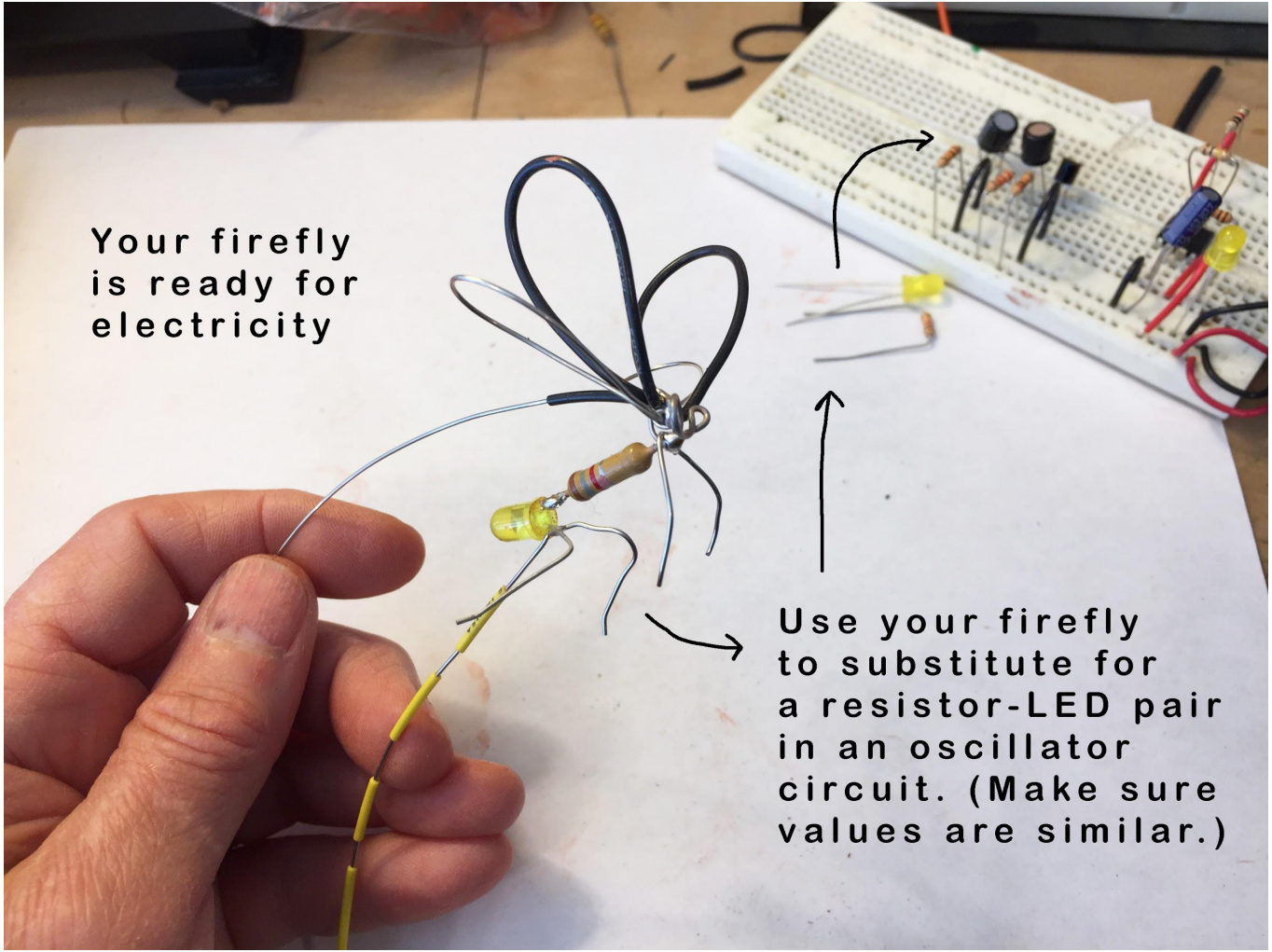


Gently strip black wire (silver “flight trail”)

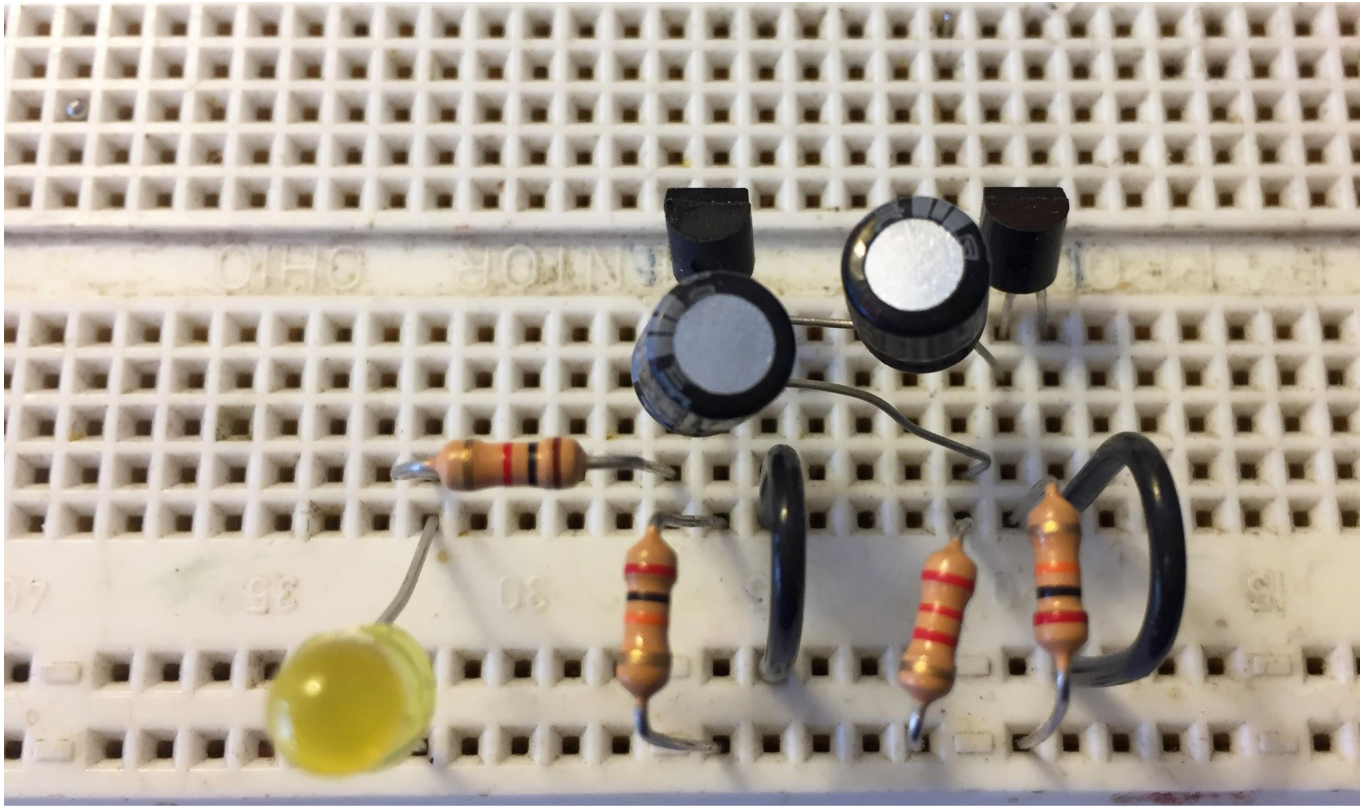
Kelly Heaton, 2020



Kelly Heaton, 2020

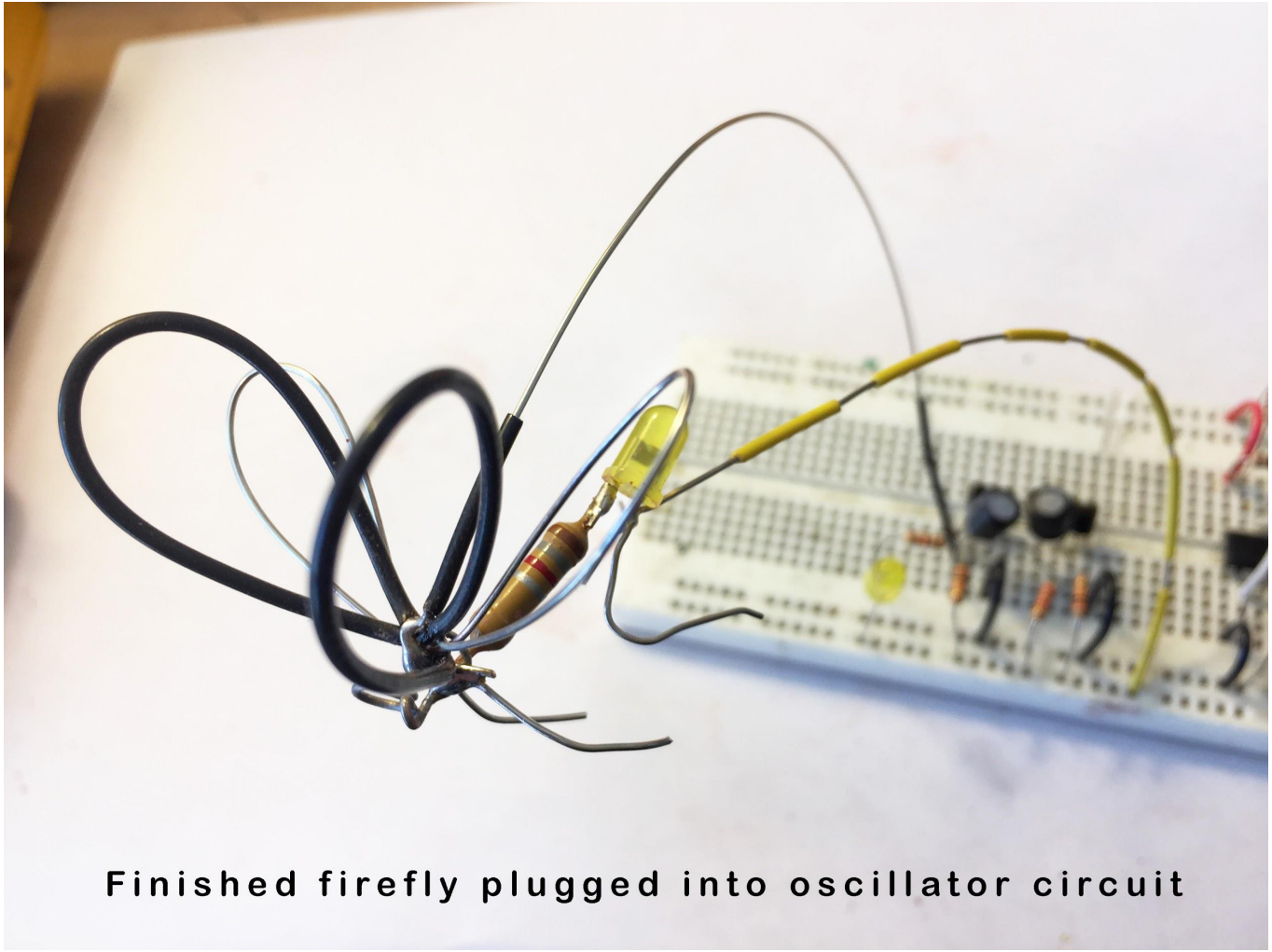


Kelly Heaton, 2020



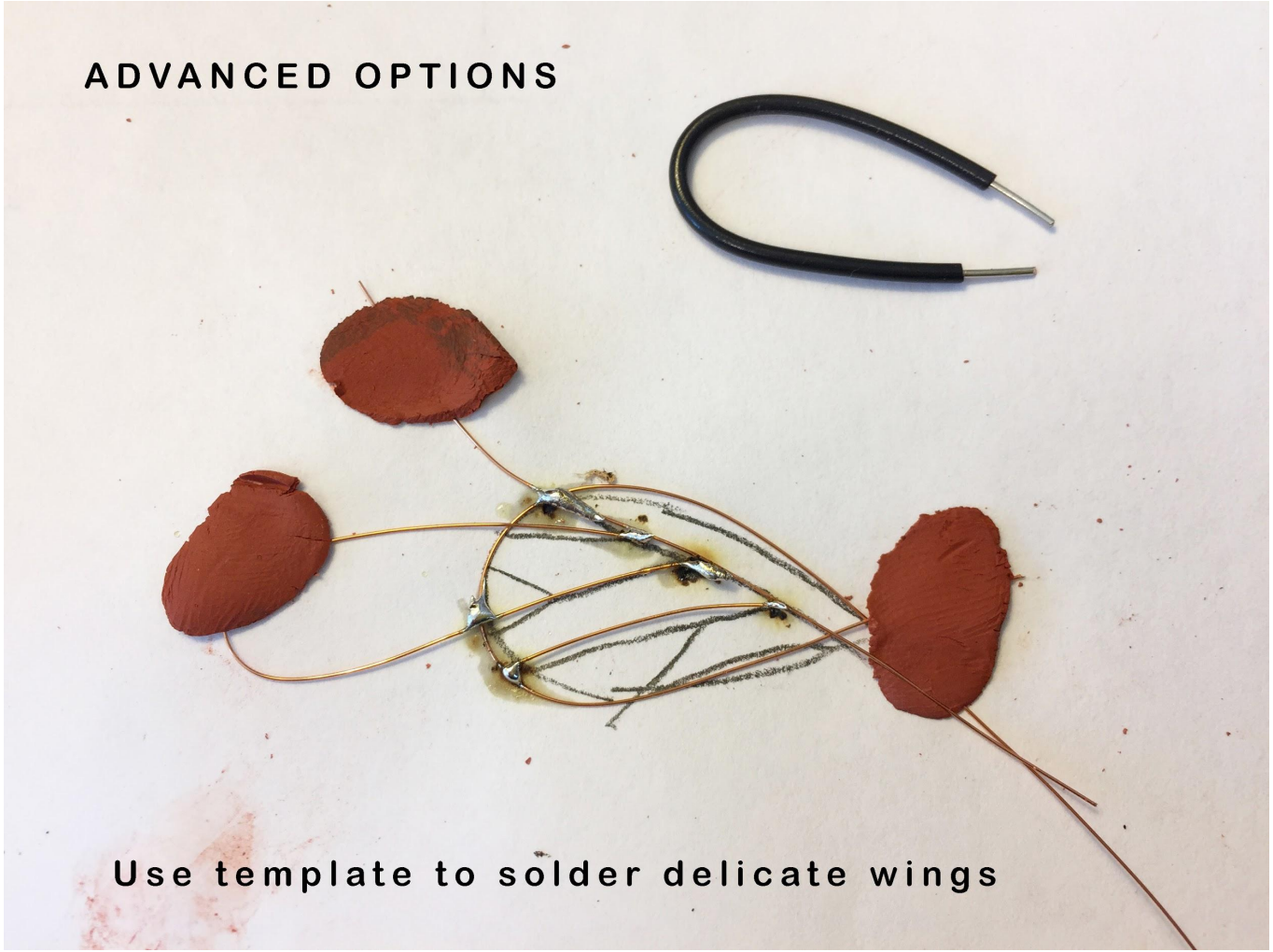
Build an astable multivibrator

Kelly Heaton, 2020



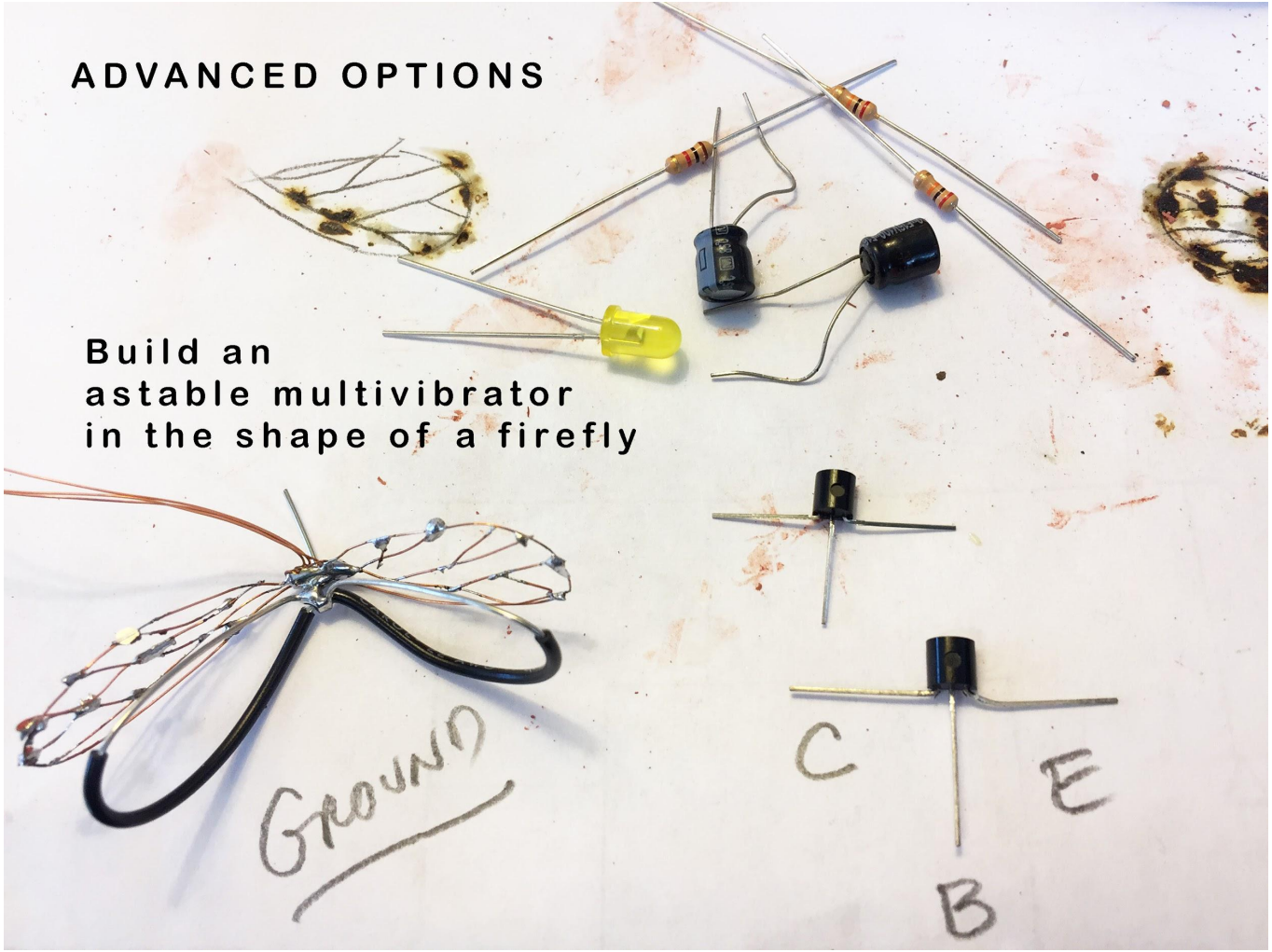
Finished firefly plugged into oscillator circuit

Kelly Heaton, 2020



Kelly Heaton, 2020

ADVANCED OPTIONS



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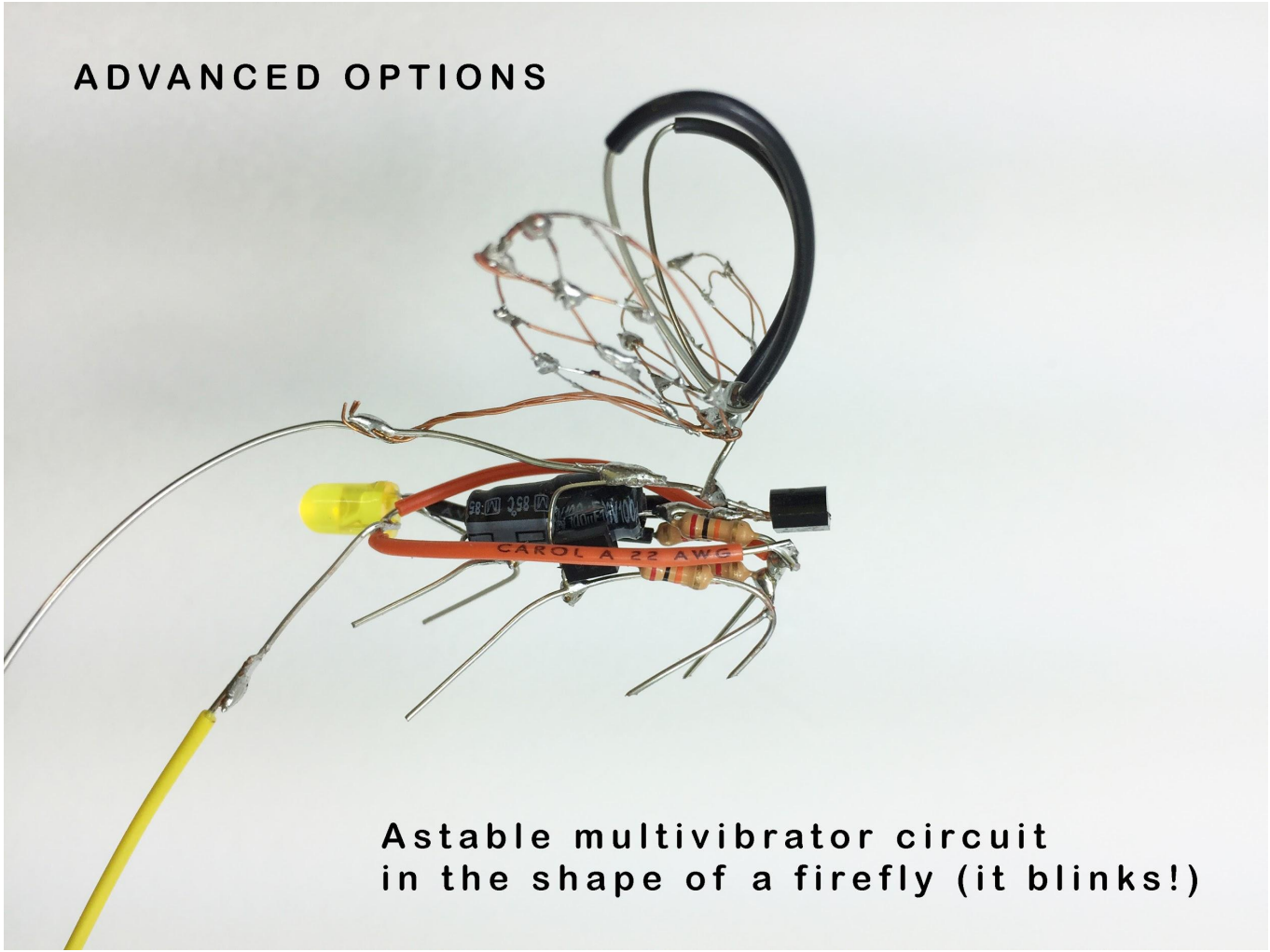

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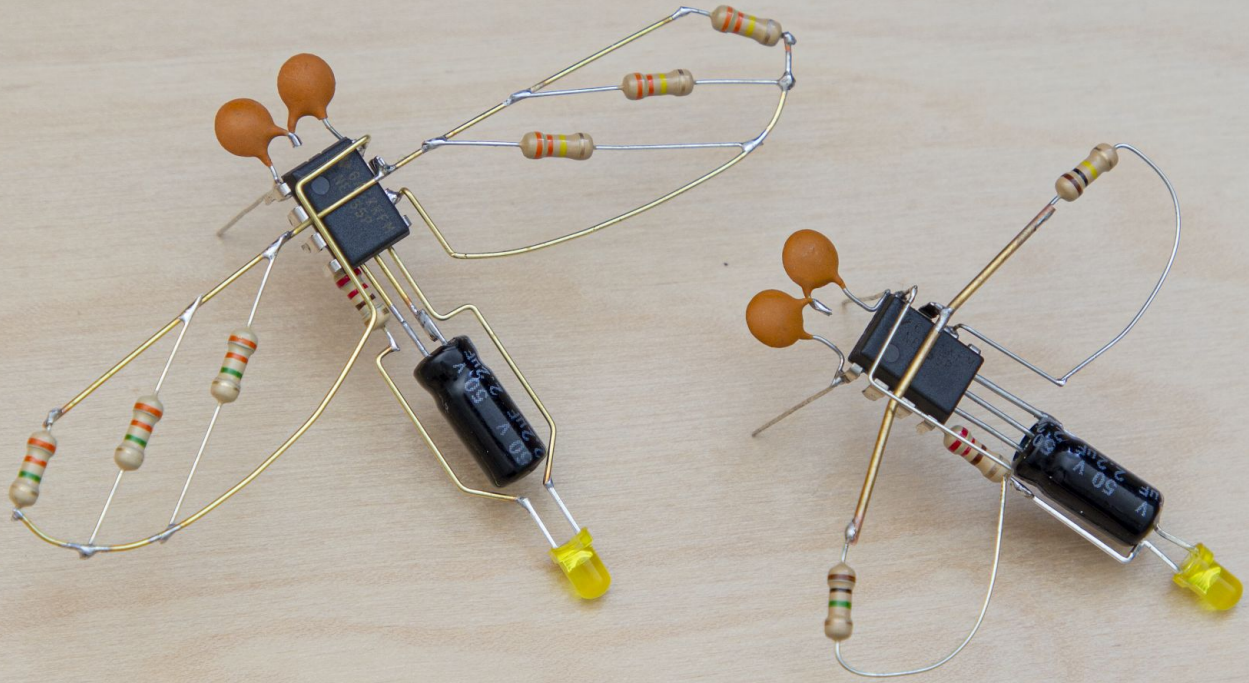
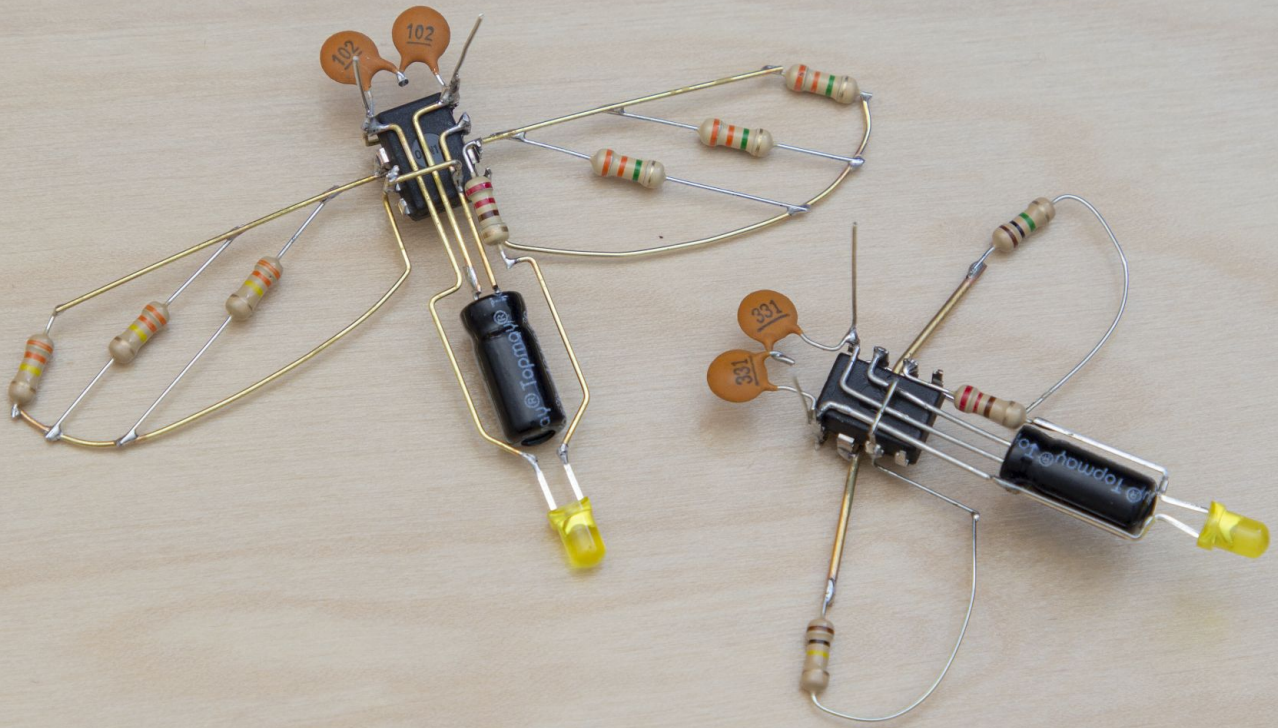
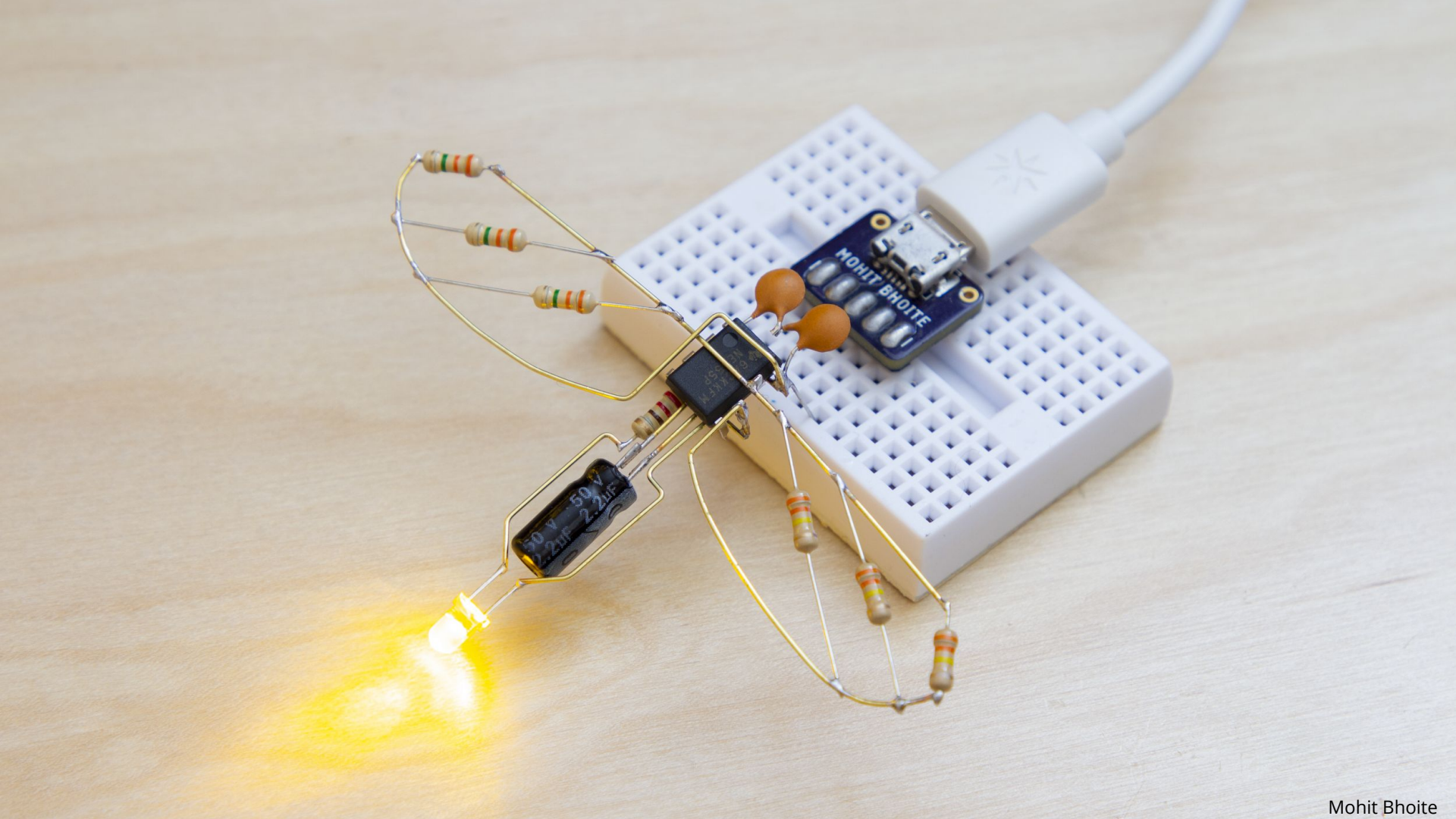
555 BASED FIREFLY



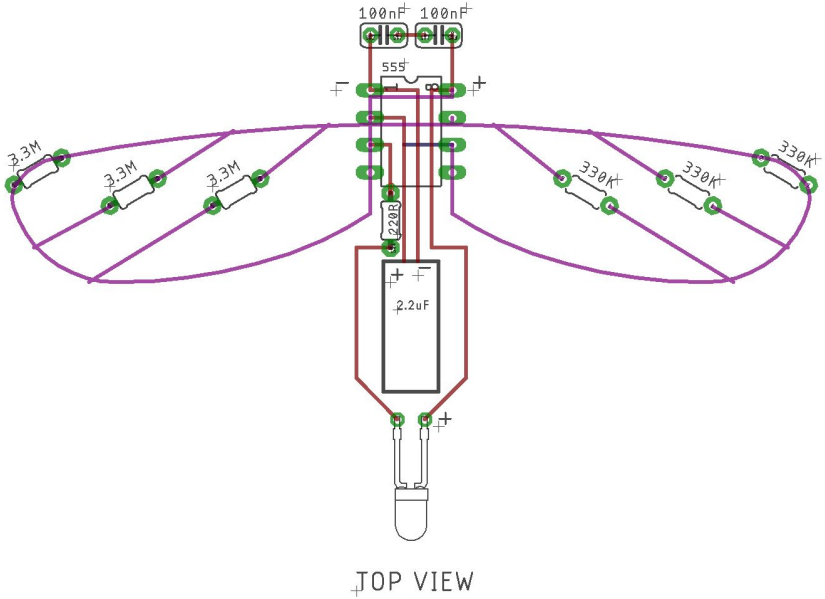
Mohit Bhoite

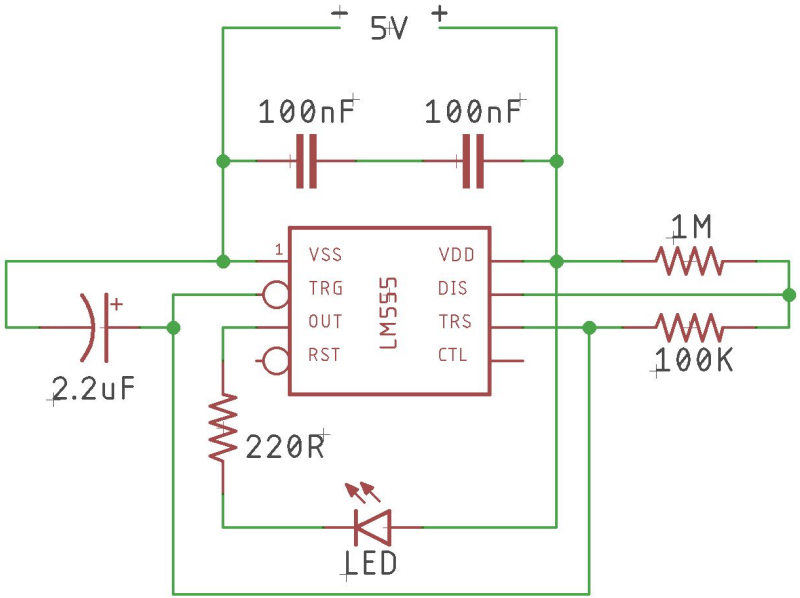


Mohit Bhoite



Mohit Bhoite


100nF
100nF
555
3.3M
3.3M
3.3M
330K
330K
330K
220R
2.2uF
TOP VIEW


5V
100nF
100nF
1M
VSS
TRG
OUT
RST
LM555
VDD
DIS
TRS
CTL
100K
2.2uF
220R
LED

LET’S START BUILDING!