sh=mak=s

Interactive monster

How to begin with e-textiles and wearables

Nuria Robles | Fab Lab León | May 2021

Interactive monster:

Color composition + textiles + electronics

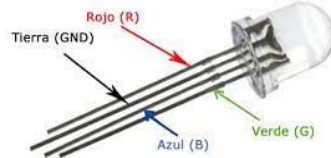Get the LED to shine in your favorite color and make your own textile character.

What will we learn today?

We will remember how a **LED** and its polarity are working.

We will discover a new type of LED: The **RGB**

Rojo (R)
Tierra (GND)
Verde (G)
Azul (B)

We will meet a new material: The **velostat**

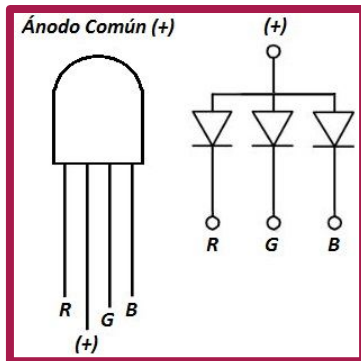We will sew a laser cut **textile character**

Let's document!

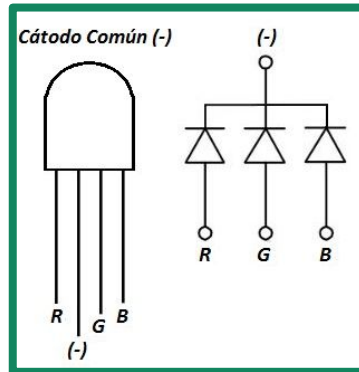For these LEDs, the longest leg is not necessarily the positive (+) one.
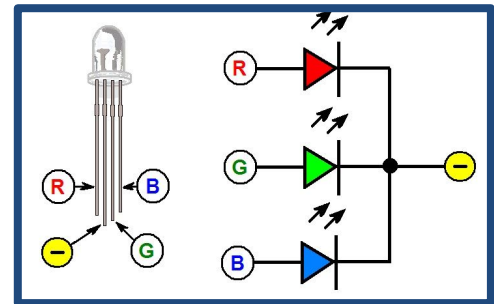
Common anode (CA)

Plus (+) is the longest pin

Common cathode (CC)

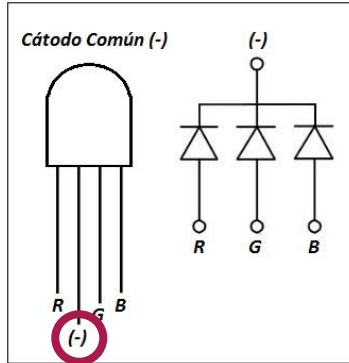Minus (–) is the longest pin

For this activity

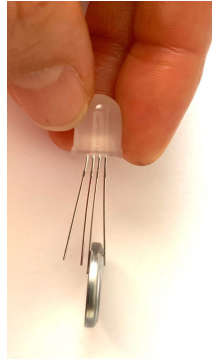Check (next slide)that you have a **CC** RGB LED

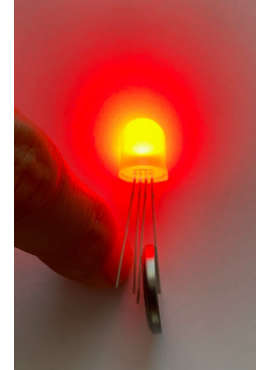# Let's check that we have a common cathode RGB!

1. Identify the longest leg

Cátodo Común (-)

(-)

R G B

(-)

2. Place the battery (+) on the longest leg
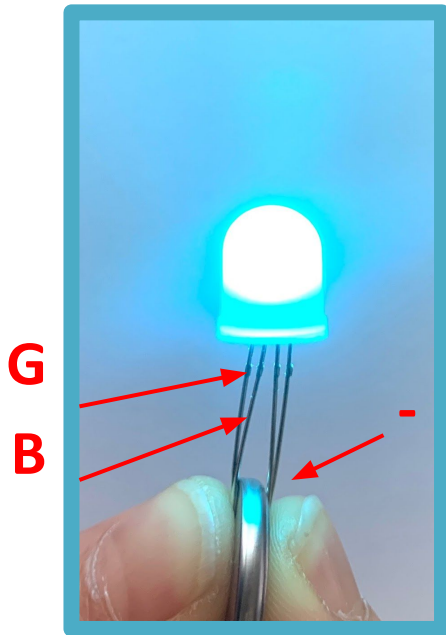

It doesn't light!

3. Place the battery (–) on the longest leg

It ligths!

Can you think of a way to create the turquoise color ?

The turquoise color is composed of blue and green, so if you put the B and G legs connected to the (+) and the long leg to the (–) the LED will produce a turquoise color.

VELOSTAT :
It is a material which the electrical resistance varies when it is pushed on

Velostat

Put the piece of velostat between one of the leg of the LED and the battery. What happens if you vary the pressure you apply on it ?

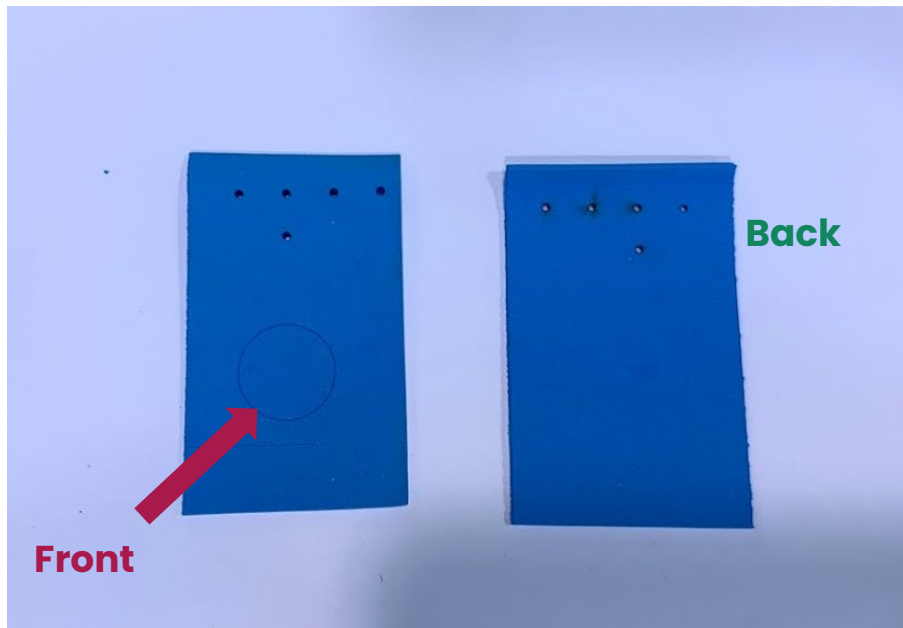# Now we are going to make the assembly of the circuit on a rectangle of Goma EVA

List of materials

1 LED RGB (common cathode, 10 mm)
2 3V BATTERY 2032
3 CONDUCTIVE TAPE
4 GOMA EVA(50x80mm)
5 VELOSTAT
6 PIECES OF FELT(cutting file)

Making the electrical circuit 1
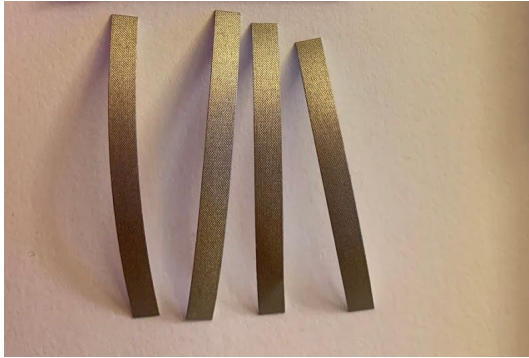

Back

Front

Identify the two parts of the Goma Eva:

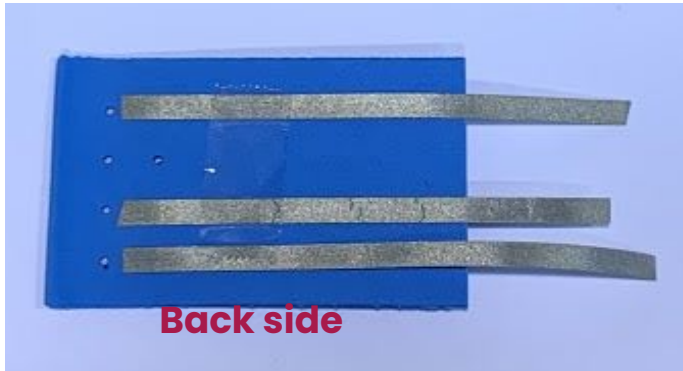The **front part** is the one with the circle engraved, for the battery.

Making the electrical circuit 2

1

2

Back side

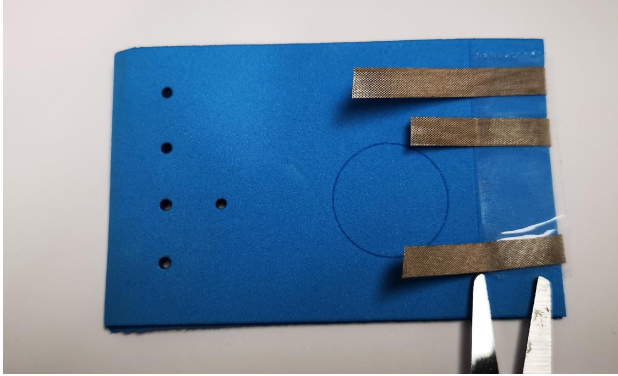**1** Cut 4 pieces of 8cm of conductive tape.

2 stick 3 of them on the **back side** as indicated on the picture.
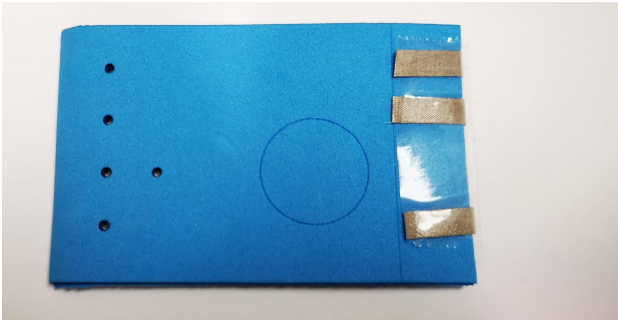
Do not cut excess tape**.**

Making the electrical circuit 3

1 Fold the excess tape to the front part.
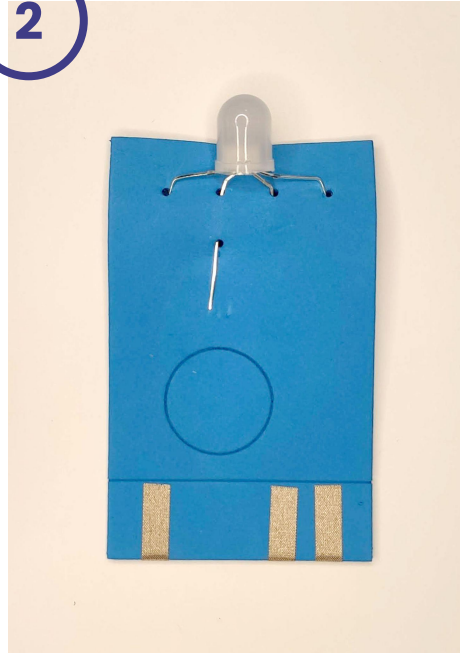
2 Cut the tape going beyond the line.
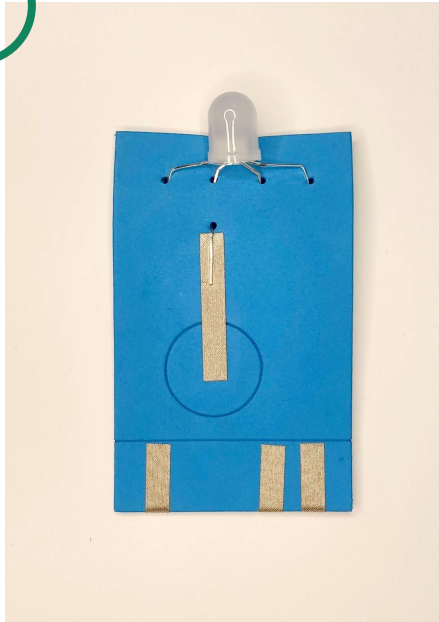
Making the electrical circuit 4

1 Align the longest leg in the row with 2 holes

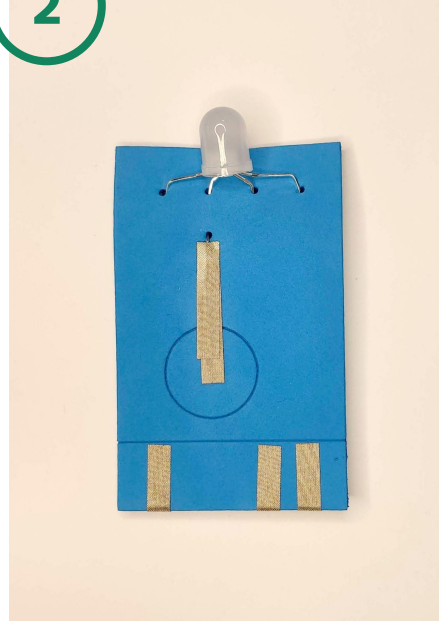**2** insert the LED legs in the Goma Eva holes

Making the electrical circuit 5

1 Stick the 4th piece of conductive tape, from UNDER the longest leg of the LED, to the battery footprint.
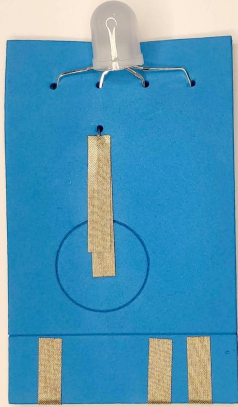
2 Secure the leg on the track with another piece of tape on top of it
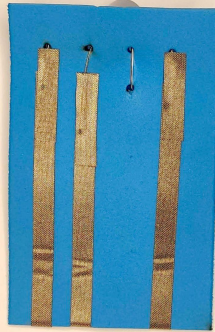
Making the electrical circuit 6

1

Front side
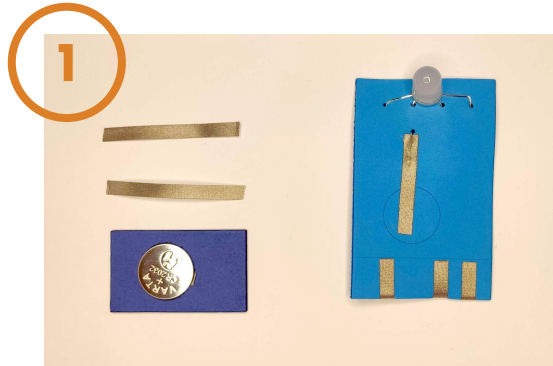
2

Back side

1 Put a piece of tape under and on the leg is our way to "solder" and secure the circuit. Like a sandwich
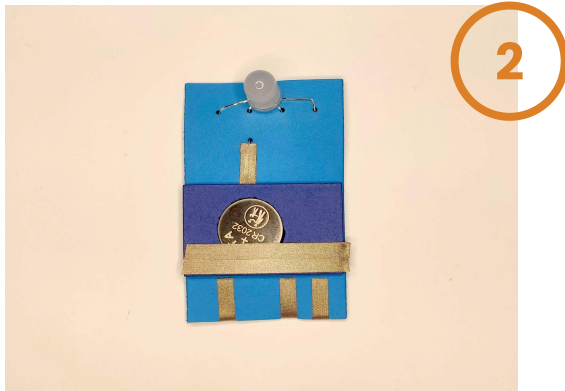
2 Repeat the "soldering" process for each leg of the LED.

Connecting the battery

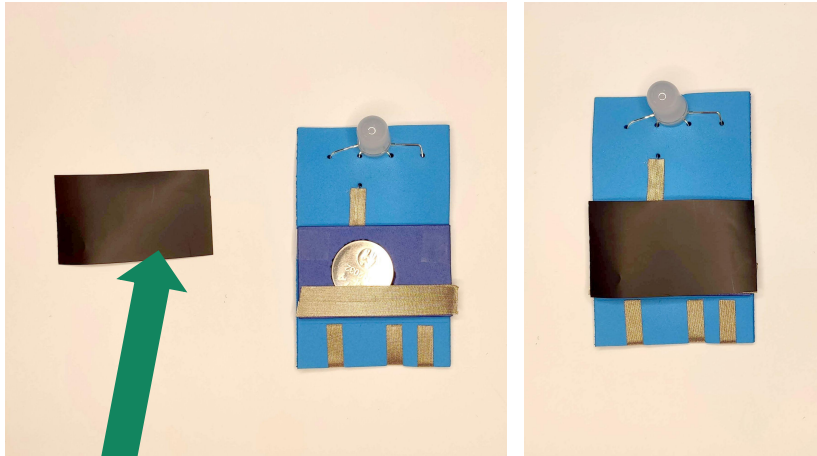**1** Place the battery in the piece of Goma Eva, the (+) has to be facing up, as indicated on the photo.

2 Stick 2 strips of conductive tape, touching each other, at the bottom of the Goma Eva rectangle.
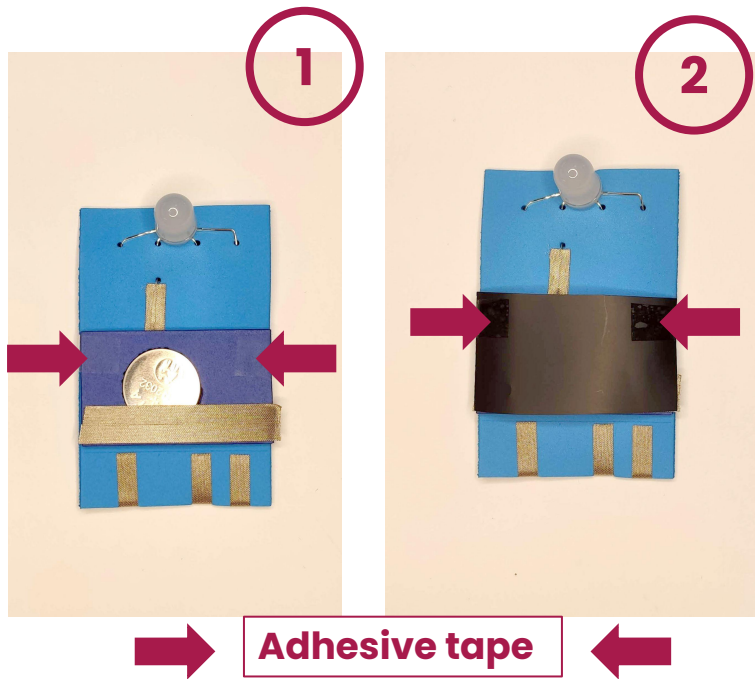
Connecting the battery

1 Place the Goma Eva"battery holder" on the circuit, as indicated on the picture

2 Place the piece of Velostat on the battery.

Velostat

Secure the circuit

Adhesive tape

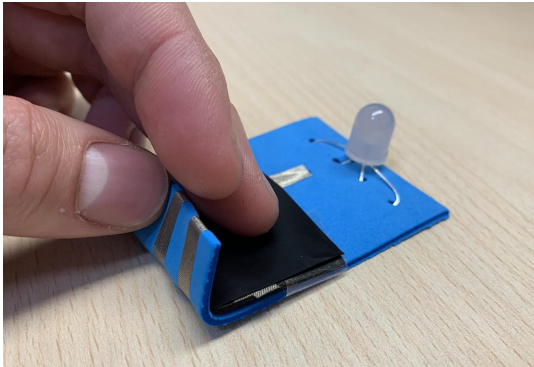**1** Secure the battery holder position with a piece of adhesive tape.

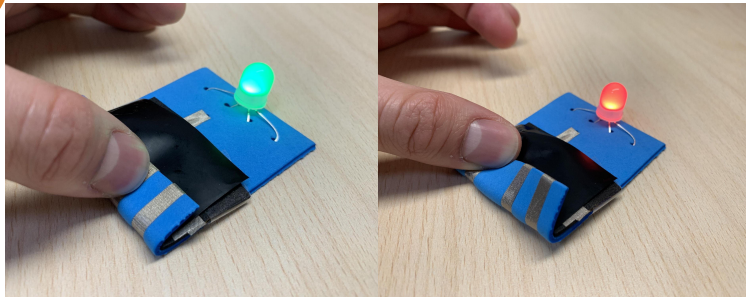**2**. Repeat the operation to secure the piece of Velostat
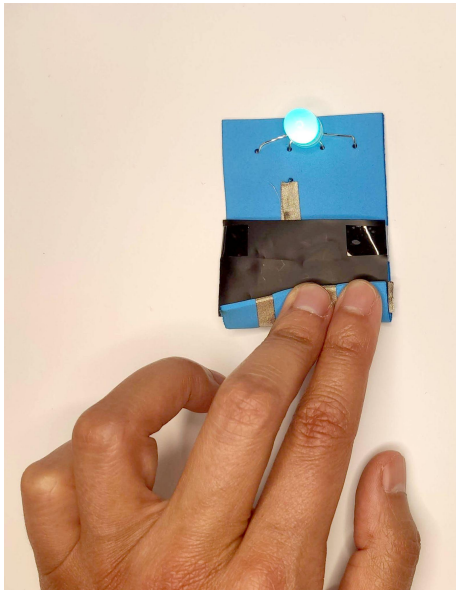
Make the switch

1 Fold the bottom part on the battery holder, and attach it loosely with adhesive tape. The LED should turn off if no pressure is applied.

2 Press each track of the circuit on the Velostat surface, and observe how the LED colors are changing.

Challenge: Get the color TURQUOISE

The color turquoise is composed of blue and green, by pressing these color's tracks at the same time we can make color variations.

Plus, the velostat allows us to vary the intensity of each color..

Document in your notebook how to get other colors such as :
Pink, purple, yellow or orange

We are going to integrate the circuit you just built into a Felt character

Making the character
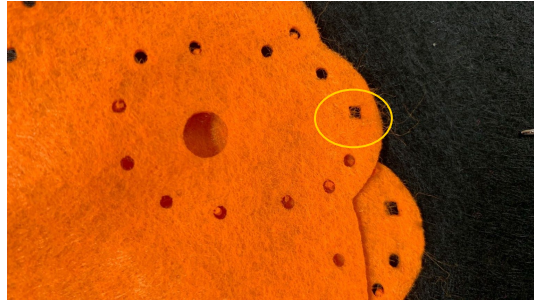

For this part you will need :

- Pieces of colored felt
- Felt character ([download the amongUs](#))
- Needle and thread
- Scissors
- The circuit you made

Making the character

Thread the thread in the needle, making a chubby knot at the end, so that it is caught in the hole.

Locate the squared holes in both parts of the character to make them coincide.
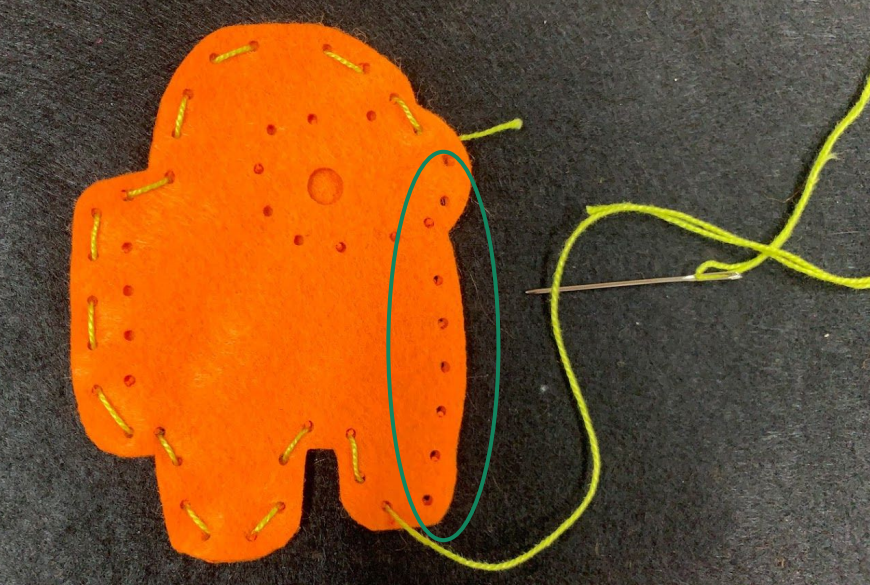
Sewing

We'll start by introducing the needle through the inside of the felt piece.

Then, sew each hole, going from one side to the other in order to hang both parts of felt together.
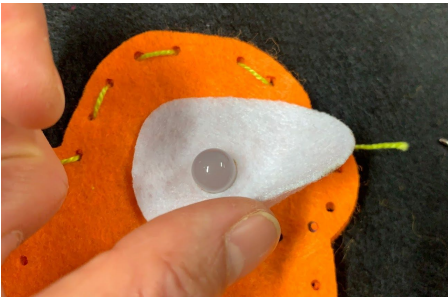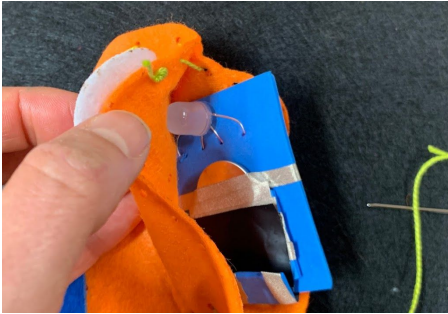
Sewing

Reserve a part of the character without sewing it, in order to introduce the electronic circuit.
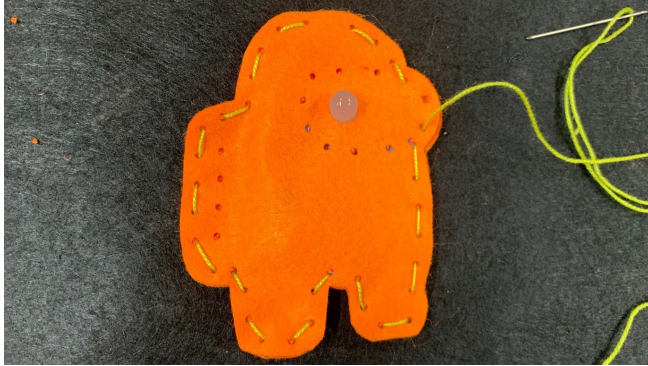
Placing the circuit inside the monster

Introduce the circuit by placing the LED in the hole of the felt pattern.

Finish sewing and make a knot to secure your work.

Challenge :

How would you make your own character ? Ready to design it ?

Next step

Share your creations :

We love to see different models, please , share yours in IG and tag @shemakes_eu @fabricademy @fablableon and @you

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Thank you

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