



Lilypad Arduino Light-up Critter

by [heasley](#) on March 17, 2014

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Intro: Lilypad Arduino Light-up Critter

Follow these instructions to make a stuffed bunny that lights up when you touch its ears together. This project can be created using fabric scraps and a Lilypad Arduino.

Materials:

- 1 Lilypad Arduino
- 4 LED lights
- Conductive thread
- A mini USB adapter

- Paper
- pencil
- Fabric scraps
- Thread (any color)
- Embroidery thread (any color)
- 1 metal sew-on snap
- Two buttons
- Glue or clear nail polish
- Stuffing



Step 1: Draw Your Pattern

This pattern comes from the blog revoluzza.com. It's in German, but the pictures are pretty easy to follow. First, draw out the shape for your bunny on a piece of paper (I taped together two pieces of 8.5 x 11 to get it big enough). Draw the oval for the face, two circles for the cheeks, a heart, and a panel for the back pocket if desired. This type of pattern is easy to manipulate, so adapt it any way you like!



Step 2: Cut Out Your Fabric

You will need two pieces to sew the main body of your toy. Fold your chosen piece of fabric in half so that the good side is facing in. Pin your pattern in place, then cut it out. You will only need a single piece of fabric for the cheeks, heart and pocket. Cut those out as well, and set them aside. (Wait till the next step to cut the piece for the face.)

Step 3: Sew the Face

I wanted the face of my bunny to be inset, rather than sitting on top of the fabric body. If you would prefer your toy this way as well, take the paper pattern you created for the face and place it on top of one piece of the fabric body. Trace the pattern, then cut out the oval. Next, take a square of fabric larger than the hole you cut and place it under the hole. Pin the edges of the main fabric under, then sew the two pieces together.



Step 4: Add the Other Pieces

Now sew on the cheeks and heart. You can attach these by hand, or with a sewing machine. To add the back pocket, tuck under the edges of the pocket piece and sew it to the back of the fabric body. Next, add the buttons.



Step 5: Sew the Toy Together

Turn your fabric so that the outside is facing in, then pin it together. Sew around the edges of the toy, leaving a 2.5 inch hole for stuffing. Then, turn your toy right-side out again.

Step 6: Now for the Arduino!

If you haven't already installed your arduino software and drives, do so now. Leah Buechley's [Lilypad tutorial](#) is excellent, and provides step-by-step instructions for set-up. This project uses a slight modification of the basic code Fade. You can find the original code on the [Arduino website](#). The modified code is attached below. This code will slowly fade the LED lights in and out. Upload this code to your Arduino, check that it's working, then carefully break your board apart.

Fade:

/*

Fade

This example code is in the public domain.

Modified from arduino.cc/en/Tutorial/Fade#UySih17lc7B.

*/

```
int led = 5; // the pin that the LED is attached to
int led2 = 6;
int led3 = 10;
int led4 = 11;
int brightness = 0; // how bright the LED is
int fadeAmount = 5; // how many points to fade the LED by
```

// the setup routine runs once when you press reset:

```
void setup() {
  // declare pins to be an output:
  pinMode(led, OUTPUT);
  pinMode(led2, OUTPUT);
  pinMode(led3, OUTPUT);
  pinMode(led4, OUTPUT);
}
```

// the loop routine runs over and over again forever:

```
void loop() {
  // set the brightness of pins:
  analogWrite(led, brightness);
  analogWrite(led2, brightness);
  analogWrite(led3, brightness);
  analogWrite(led4, brightness);
```

// change the brightness for next time through the loop:
 brightness = brightness + fadeAmount;

// reverse the direction of the fading at the ends of the fade:

```
if (brightness == 0 || brightness == 255) {
  fadeAmount = -fadeAmount ;
}
```

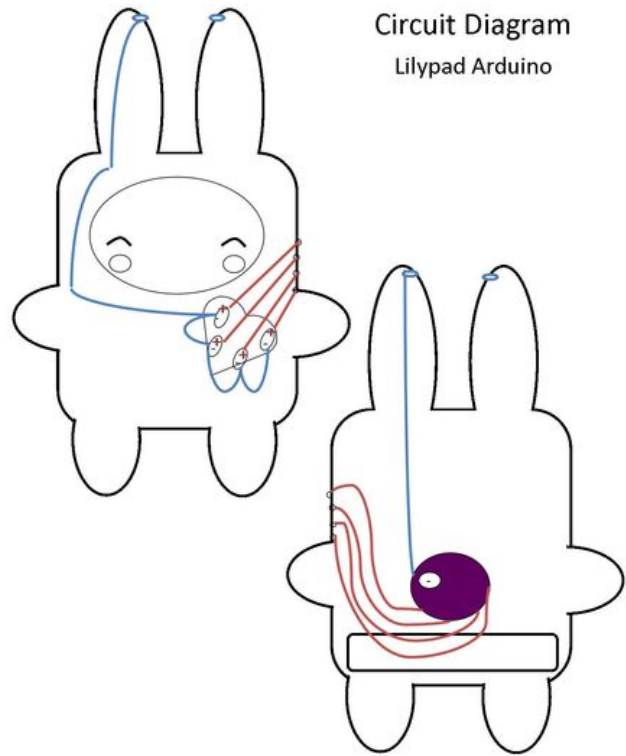
// wait for 40 milliseconds to see the dimming effect
 delay(40);
}

Step 7: Sewing Circuits

This circuit diagram shows the pattern of the connections. First, attach your Lilypad board to your toy using a bit of glue or nonconductive thread. Next, sew a line from pin 5 that leads to the (+) end of an LED, placed on the heart. Loop the thread multiple times around the pin on the Lilypad and around the LED to ensure a good connection. Repeat for pins 6, 10 and 11, being careful not to cross your threads. The conductive thread tangles and breaks easily. If your thread breaks, you can tie a knot on the inside of your toy and connect it to a new piece of conductive thread. This won't affect your circuit at all.

After your positive connections have been sewn, it's time to sew your ground thread. Securely connect one end of your thread to the ground (-) pin on your Lilypad, looping the thread several times to ensure a good connection. Next, sew all the way to the tip of one ear, and attach one piece of your snap to the top with your conductive thread. Loop the thread securely, then tie it off. On the next ear, attach the other side of the snap. Then sew a line of thread that connects the (-) side of each of the LED lights. After you attach your ground thread to the end of the last LED, you're done sewing. Touch the snaps together and watch the lights come on!

If your lights don't come on, it's possible that a thread broke or that the connections crossed. Inspect your stitches for loose ends that might be touching and creating a loop in the circuit.



Step 8: Stuff Your Toy

Before you close up your bunny, touch up the knots you tied in the conductive thread with glue or clear nail polish. This will keep the ends from fraying and touching to create a loop in the circuit.

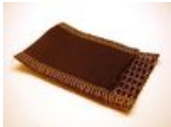
Using a stuffing of your choice (I used a polyester filling), fill your toy. Make sure to pack stuffing in to the ears, tips of the hands, and the feet. The end of a pencil can be useful for getting the stuffing in to tight places. The stuffing will settle, so pack in as much as you can. Finally, sew your toy closed. Congratulations! You are now the official owner of a computerized toy rabbit wearing pajamas.



Related Instructables



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Comments

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Danger is my middle name says:
Oh my gosh, this is so cute!

Mar 18, 2014. 10:32 AM [REPLY](#)