

LED Throwies

by **Q-Branch** on February 14, 2006

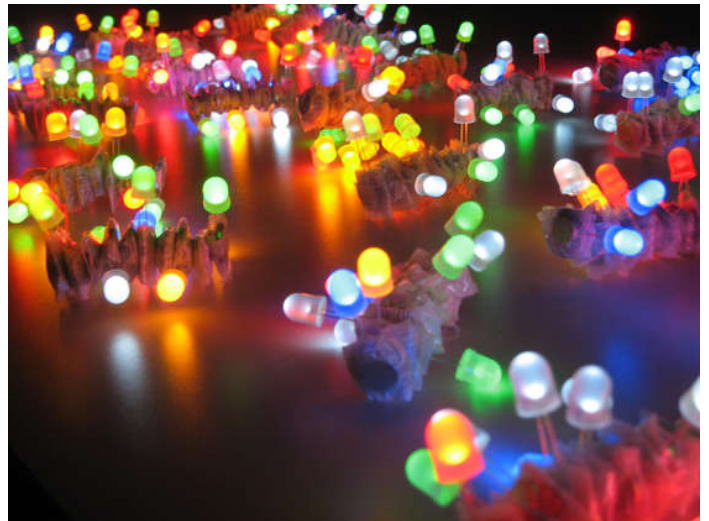
Table of Contents

License: Public Domain Dedication (pd)	2
Intro: LED Throwies	2
step 1: Materials List	4
File Downloads	4
step 2: Test the LED	4
step 3: Tape the LED to the battery	6
step 4: Tape the magnet to the battery	7
step 5: Toss your Throwie	7
step 6: Plan a campaign	10
step 7: Other applications and upgrades	11
Related Instructables	12
Advertisements	12
Comments	12

Intro: LED Throwies

Developed by the [Graffiti Research Lab](#) a division of the [Eyebeam R&D OpenLab](#), LED Throwies are an inexpensive way to add color to any ferromagnetic surface in your neighborhood. A Throwie consists of a lithium battery, a 10mm diffused LED and a rare-earth magnet taped together. Throw it up high and in quantity to impress your friends and city officials.

[Click on this link to see the LED Throwies in action in NYC thanks to resitor and fi5e!](#)



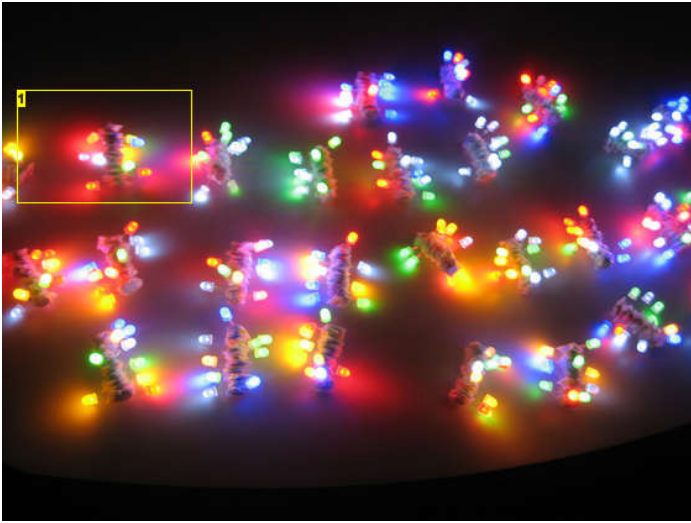
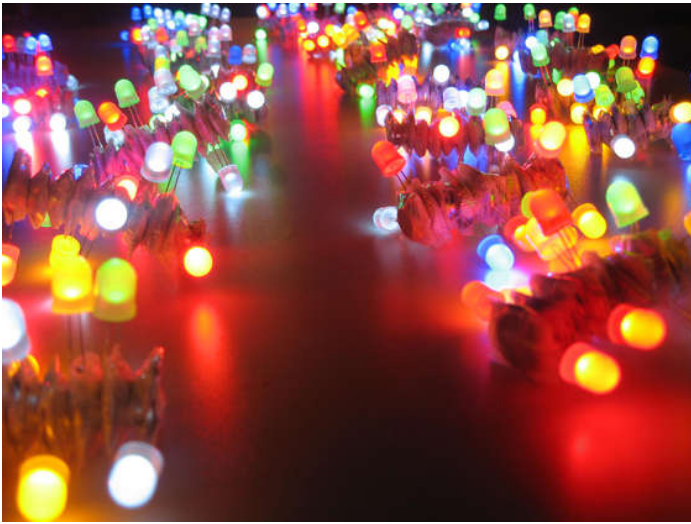
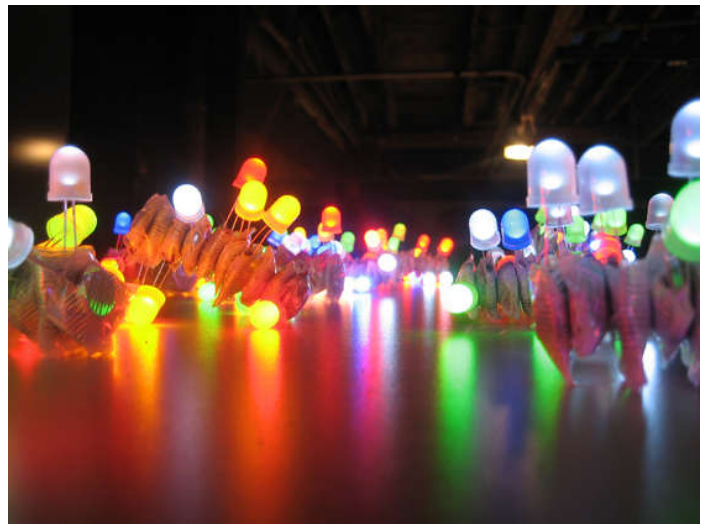
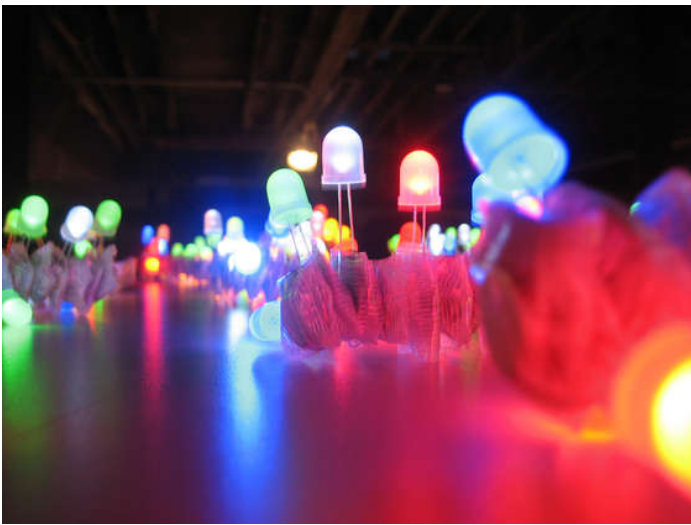


Image Notes
1. over 270 LED throwies



step 1: Materials List

LED throwies consist of only a few inexpensive parts and can be made for ~\$1.00 per Throwie. You can reference the parts list below or download the attached spreadsheet for more info on parts, part's numbers, vendors and application notes.

Part: 10mm Diffused LED

Vendor: HB Electronic Components

Average cost: \$0.20 avg per LED

Notes: Cost reductions for larger quantities. Comes in red, blue, amber, white in both diffused and clear. Diffused works better than water clear for the Throwie application. HB has even created a [Throwies packs](#) page with deals on 10mm LEDs and lithium batteries!

Part: CR2032 3V Lithium Batteries

Vendor: CheapBatteries.com

Cost: \$0.25 per battery

Notes: Cost reductions for larger quantities. With the 2032 Lithium batter, depending on the weather and the LED color, your Throwie should last around 1 -2 weeks.

Part: 1-inch wide Strapping Tape

Vendor: Your local hardware store

Cost: \$2.00 for one roll

Notes: One roll will make many throwies

Part: 1/2" Dia x 1/8" Thick NdFeB Disc Magnet, Ni-Cu-Ni plated

Vendor: Amazing Magnets

Cost: \$13.00 per 25 magnets

Notes: Cost reductions for larger quantities

Part: Conductive Epoxy

Vendor: Newark In One

Cost: \$32.00

Notes: The epoxy is optional.

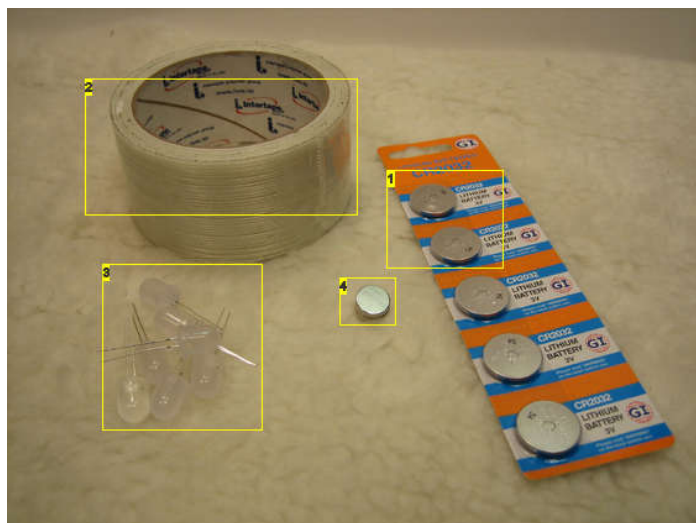


Image Notes

1. CR2032 lithium batteries
2. 2-inch wide strapping. We tore it into two 1-inch stripes.
3. 10mm LED, diffused, multiple colors
4. Strong little rare-earth magnet

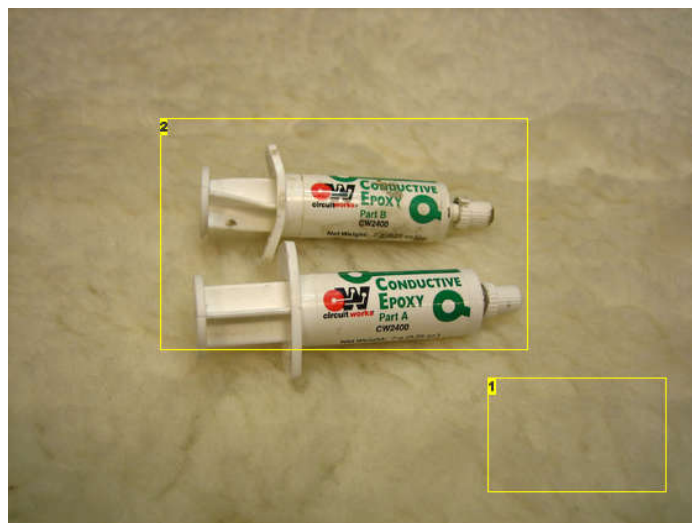


Image Notes

1. To use the epoxy, mix in equal parts A and B. Mix well. Then apply to leads and preload them into the battery contact surfaces. Allow a few hours to dry and 24 hours to cure..
2. Conductive epoxy is optional. IT will improve brightness and robustness but it is time and labor intensive

File Downloads



[LedThrowiesPartsList.pdf](#) (55 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'LedThrowiesPartsList.pdf']

step 2: Test the LED

Test your LED to determine color, brightness and functionality. Pinch the LED legs, or leads, to the battery terminals. The longer LED lead, called the anode, should be touching the positive terminal (+) of the battery and the shorter LED lead, called the cathode, should be touching the negative terminal (-) of the battery.

Note that the positive terminal on the battery has a larger contact surface than the negative terminal. The positive terminal extends around the sides of the battery. Don't let the cathode lead of the LED accidentally touch the positive terminal of the battery. This will create a short and cause the LED to function improperly.

For more information on LEDs click [here](#) .

For more information on batteries click [here](#) .

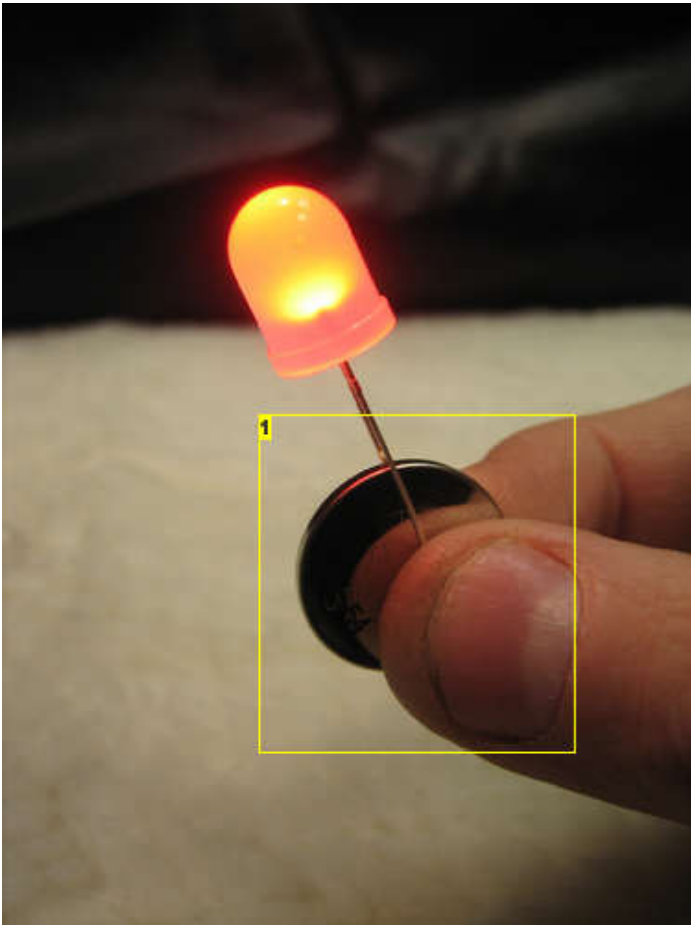


Image Notes

1. anode lead touching the positive terminal

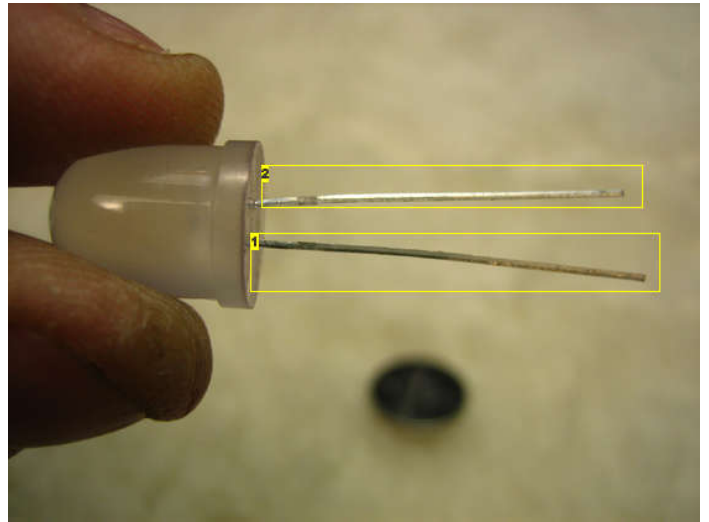


Image Notes

1. anode lead
2. cathode or K lead



Image Notes

1. notice how the positive terminal extends around the edge of the battery.

step 3: Tape the LED to the battery

Cut off a piece of 1-inch wide strapping tape approximately 7-inches long. Tape the LED leads to the battery by wrapping tape 2-3 times around both sides of the battery. Keep the tape very tight as you wrap. The LED should not be flickering.

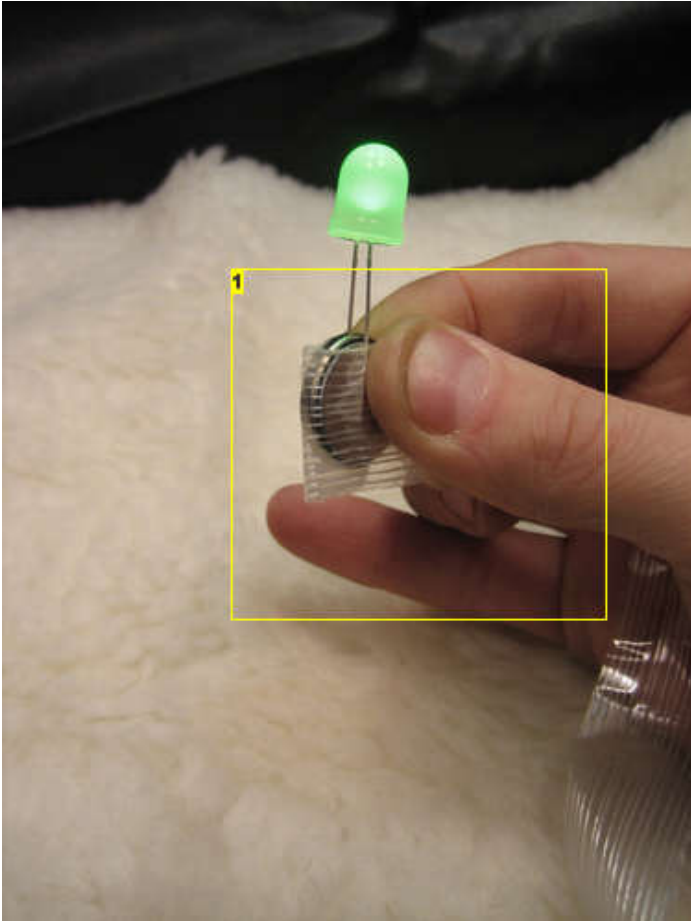


Image Notes

1. Keep up the tension!

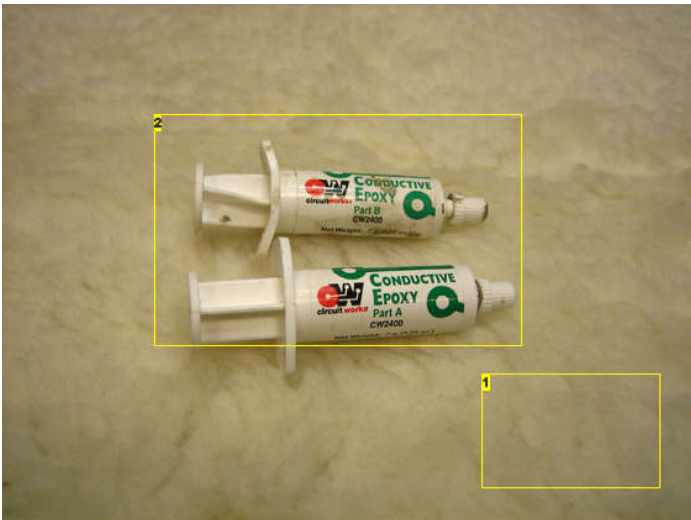


Image Notes

1. To use the epoxy, mix in equal parts A and B. Mix well. Then apply to leads and preload them into the battery contact surfaces. Allow a few hours to dry and 24 hours to cure..

2. Conductive epoxy is optional. IT will improve brightness and robustness but it is time and labor intensive

step 4: Tape the magnet to the battery

Now, place the magnet on the positive terminal of the battery and continue to tightly wrap the tape. The magnet should be held firmly to the battery. If the magnet is stuck to a ferromagnetic surface, dont pull on the LED throwie. Apply a lateral force to the magnet and slide it off the surface while lifting it with a fingernail or tool. Remember to keep the magnet away from conventional harddrives, credit cards and other data storage devices.

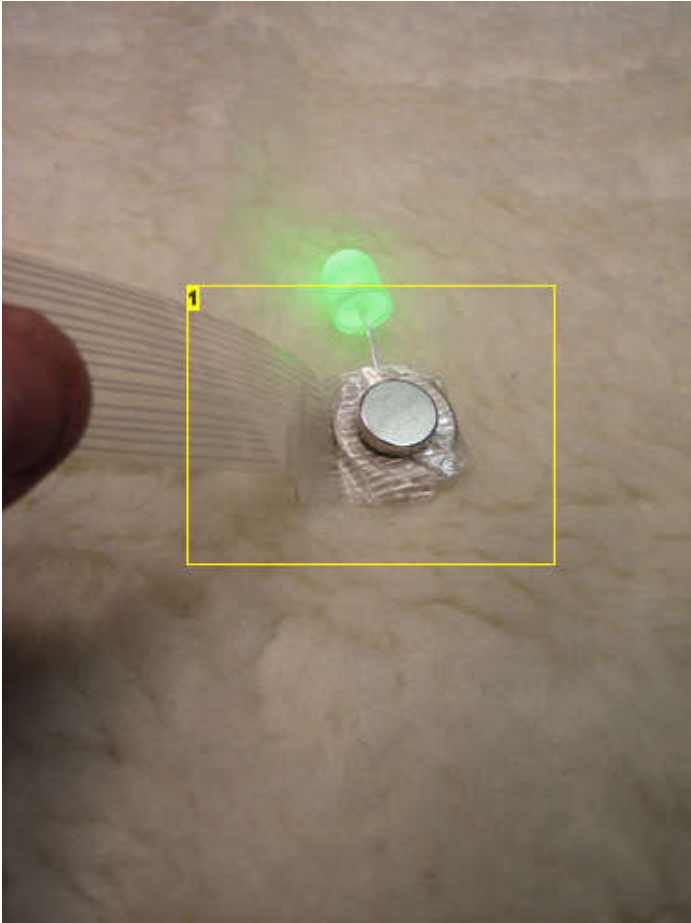


Image Notes

1. the magnet is taped the positive terminal of the battery

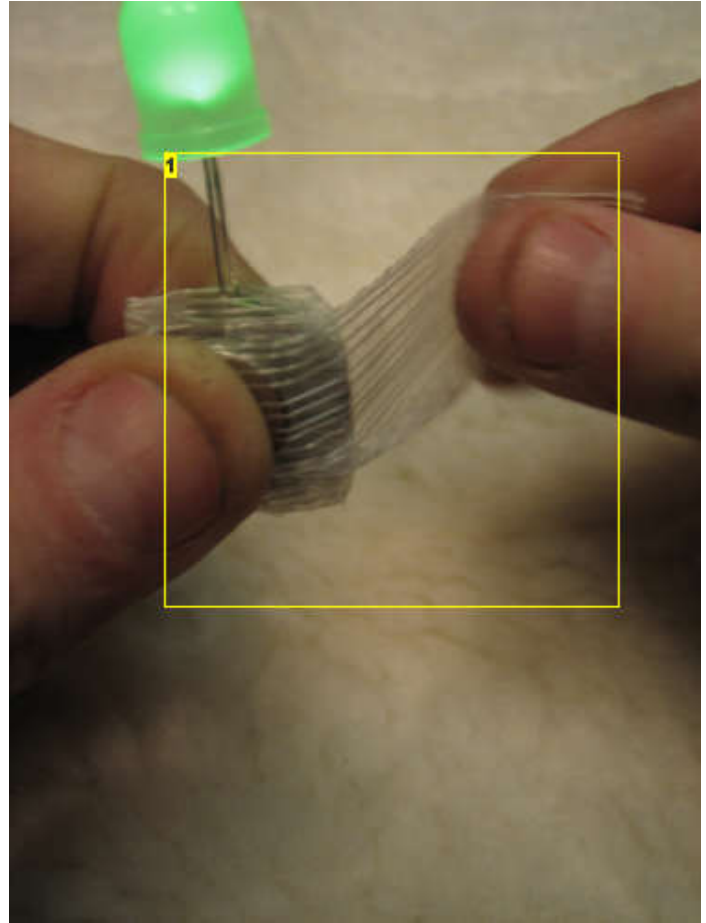


Image Notes

1. tightly!

step 5: Toss your Throwie

The LED throwie is ready to be tossed onto a ferromagnetic surface. Practice tossing your throwies. Work on your accuracy and your own personal technique. Every throwie wont stick every time, but if you toss them gently, they will stick eventually. Get them up high and in large quantities for greatest enjoyment.

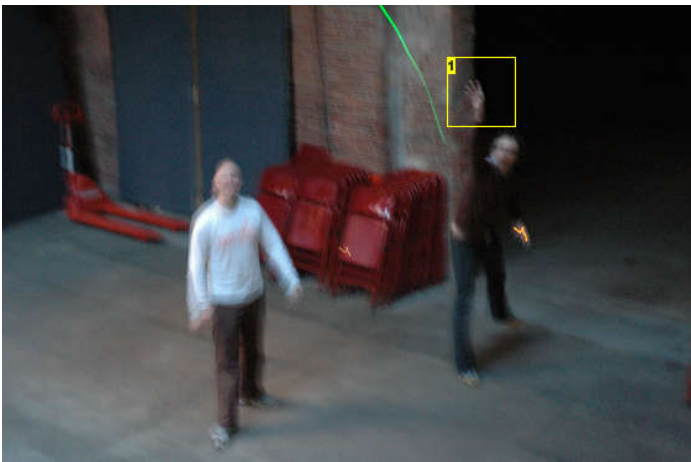


Image Notes

1. Look at J-pizzles follow-through on this green throwie

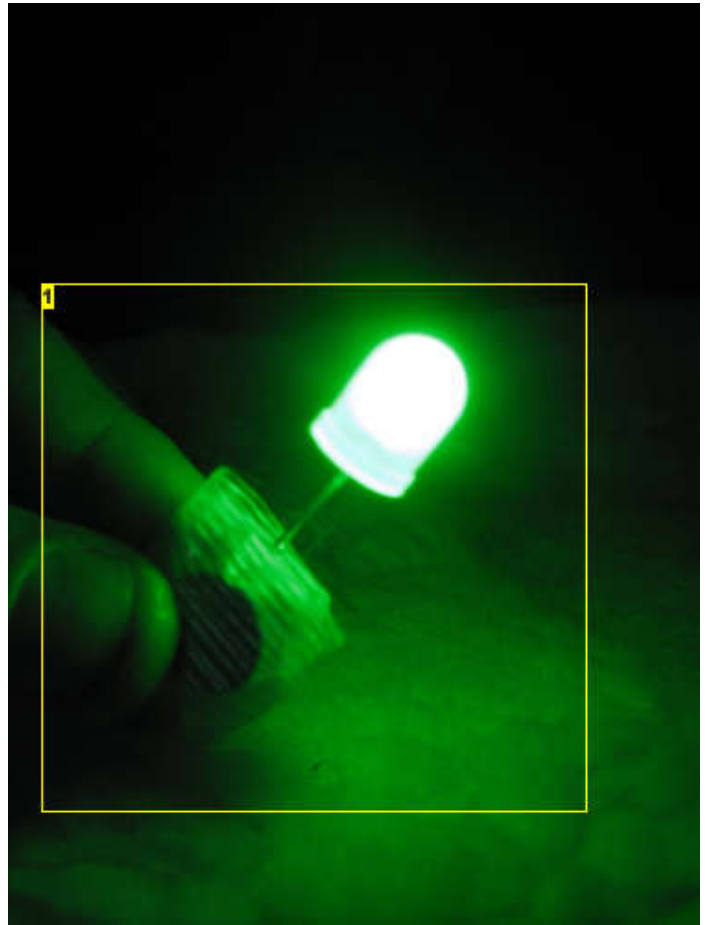


Image Notes

1. Toss the Throwie by the battery/magnet bundle.



Image Notes

1. LED throwie horse-shoes

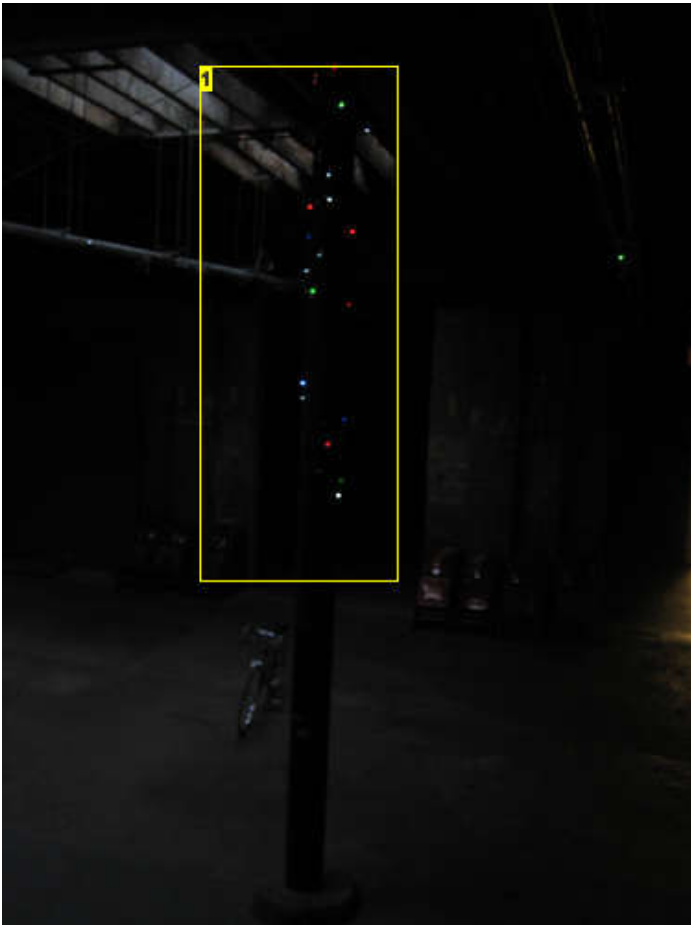


Image Notes

1. The structural columns inside Eyebeam are perfect for throwies



Image Notes

1. Led Throwies make people do things like this!

step 6: Plan a campaign

Now, find a building or structure that will attract the magnets, form a crew, wait until night, and get some throwies up. If you do it around a crowd of people, they will probably try to get into the act. It can quickly dissend into chaotic fun. Give a hand-full of throwies to a stranger and let them get up too. Remember, Throwies are only a temporary alteration of your local environment. Depending on the color, Throwies can last upto two weeks, but you arent going to cause any permanent damage, so most property owners wont mind. And The NYPD loves throwies!

Click on this link to see the LED Throwies in action!



Image Notes

1. Jim Kempner Fine Arts was the location of the first LED Throwie campaign in NYC.



Image Notes

1. People will take the LEDs off the wall and throw them back or pocket them.



Image Notes

1. The people got into the action by tossing Throwies as a family.

step 7: Other applications and upgrades

Other applications:

Other than tossing it, you can also use your LED throwie to write in the air with light while taking a long exposure flick. You can put them on your bike as an additional reflector. You can put them on surveillance cameras to make them more visible at night. You can use them to play a version of bocci ball on a magnetic surface in the dark.

Upgrades :

You can make a better LED throwie by using shrink tubing on each lead to make sure they don't short to each other or the battery. This upgrade will allow you to bend the LED so it faces in the direction you choose. You can also dip the throwie in epoxy, silicon or potting compound to make an all-weather LED Throwie. A resistor in series would allow you to increase the throwie shelf-life. Bigger batteries = longer life. Stronger magnets = increased stick probability. You could add a solar panel, photocell, etc...Have fun.

User Upgrades:

Flickr instructional set for throwie on/off switch mod -- by A. Joyce, aka. EverythingDigital

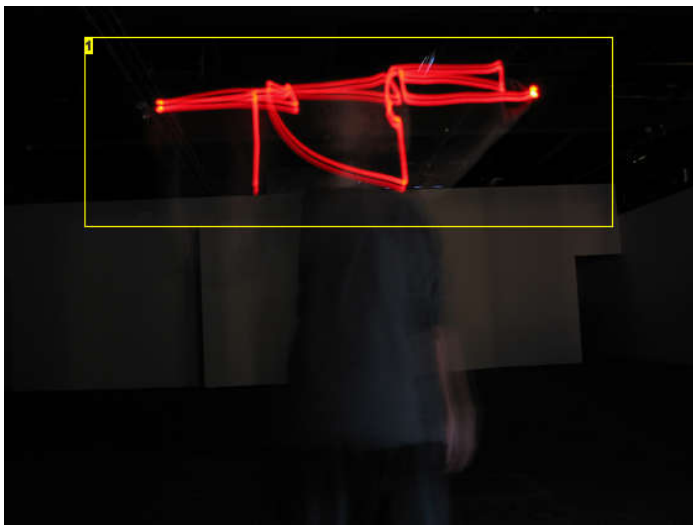


Image Notes

1. Fi5e

Related Instructables



All Surface LED Throwies by SniperNinja



My LED Throwies by zildjian



LED Throwie Talkie by pcunning



LFTT (LED Flashie Throwie Thingie) by Artificial Intelligence



Electro-Graf by Q-Branch



LED Throwie - Instant Messenger Tube by adambehman



LEDTHROW - 10010 by zoomcityzoom



LED Patchie by Stefan_Hermann

Comments

50 comments

[Add Comment](#)

[view all 1075 comments](#)



twitsl says:

This is not very eco friendly there should be a way to make these rechargeable and reusable!!!! There should also be a way to get these down so they can be!!!!
And it would be a lot safer if you put resistors on it!!!!

Jul 11, 2008. 9:28 AM [REPLY](#)



jm121 says:

(removed by author or community request)

Jul 30, 2008. 11:22 AM



twitsl says:

(removed by author or community request)

Jul 31, 2008. 8:02 AM



jm121 says:

(removed by author or community request)

Aug 4, 2008. 1:05 AM



twitsl says:

(removed by author or community request)

Aug 4, 2008. 4:13 AM



wolf55hound says:

it would be very expensive, but....maybe, a solar throwie? then during night, they turn on?

Aug 13, 2008. 10:10 PM [REPLY](#)



shammallamaman says:
That would become kind of expensive

Aug 20, 2008. 3:49 PM [REPLY](#)



hawkfrost64 says:
not really. there are solar panels that are paper thin and cost like, 25 cents.

Nov 14, 2009. 5:16 PM [REPLY](#)



twitsl says:
Good idea!!!!

Aug 16, 2008. 9:06 AM [REPLY](#)



collard41 says:
why would you want to spend that much to just throw stupid LEDs onto ferrous surfaces, it would be interesting if you threw them on cars as they drove by

Aug 23, 2008. 4:39 PM [REPLY](#)



viacin says:
(removed by author or community request)

Aug 24, 2008. 8:43 AM



collard41 says:
then you wouldnt be able to say that you couldnt see them. you could put GPS trackers on them and measure the migration of the cars through the night. get blue and red flashing LEDs and then put them on your roof, and in the radiator!!! eco campaigning is boring and stupid, spice it up a bit.

Aug 24, 2008. 3:54 PM [REPLY](#)



JasonMyers says:
They kind of look like bioluminescent mushrooms. Nice.

Nov 13, 2009. 2:46 PM [REPLY](#)



alex-sharetskiy says:
Electronic goldmine STOLE your pictures!

Aug 28, 2009. 7:11 PM [REPLY](#)

check it out:
<http://twitter.com/electronicgold/>



sensoryhouse says:
Don't be a Tattletale

Sep 2, 2009. 12:10 AM [REPLY](#)



mg0930mg says:
He was rightfully telling the owner of this photo, that someone else was using it.
Get over grade-school names like tattletale.

Nov 8, 2009. 11:40 AM [REPLY](#)



alex-sharetskiy says:
sorry

Sep 2, 2009. 6:25 AM [REPLY](#)



unominame says:
I do have the money but I don't know any 14 year-old kids with a pay-pal or credit card

Aug 28, 2009. 9:03 PM [REPLY](#)




mg0930mg says:
I got a pay-pal as soon as I turned 13. It helps with buying stuff off of the internet, and selling stuff, too.
Just get a bank account and hook the paypal up to it!

Nov 8, 2009. 11:35 AM [REPLY](#)




notanemo says:
its called visa debit. i have one. no cost, but can be used like a credit card! its eftpos, so it uses my own money.

Oct 4, 2009. 6:40 PM [REPLY](#)


 **bassclarinet23** says: Oct 15, 2009. 6:48 PM [REPLY](#)
What are these "rare earth magnet" things? I've seen them on many projects, but how do they differ from magnets, let's say, from a Magnetix toy. (I don't mean to sound rude, I'm just curious.)


 **paperclip32** says: Nov 8, 2009. 7:41 AM [REPLY](#)
they are made from neodymium(?) and are extremely strong.


 **bassclarinet23** says: Nov 8, 2009. 10:35 AM [REPLY](#)
Okay, thanks.

 **_Ko0LaiD_** says: Oct 15, 2009. 7:53 PM [REPLY](#)
Strength, metals they are made with, tons of things. Crack open an old hard drive.


 **bassclarinet23** says: Oct 16, 2009. 12:46 PM [REPLY](#)
Okay, thanks for the information.


 **nazculi** says: Nov 5, 2009. 6:49 PM [REPLY](#)
I have a dilemma, I want to use LED throwies on homecoming my graduation year on our Crows Nest. Unfortunately they built a new one made out of wood. Anybody got any ideas of a glue that won't stick forever, but long enough to enjoy them. Like a week or so.
Maybe something that they can wash off eventually with a pressure hose or something?


 **bloomautomatic** says: Nov 3, 2009. 6:17 PM [REPLY](#)
Did a bunch of these for decorations for the Halloween party. Best effect was dropping them in the ice bucket and the coolers for glowing ice. They seem to be sufficiently waterproof, at least overnight.


 **bassclarinet23** says: Oct 9, 2009. 3:47 PM [REPLY](#)
Can you use magnets from Magnetix or other magnetic toys? That's all that I have access to.

 **cam42** says: Nov 3, 2009. 2:48 PM [REPLY](#)
might not be strong enough.

 **bassclarinet23** says: Nov 3, 2009. 3:37 PM [REPLY](#)
They seem to work well enough for my purposes...(I'm not really throwing them though).


 **praline** says: Sep 9, 2009. 5:06 AM [REPLY](#)
Good day guys. Does anyone know how that rainbow throwies is working? Is there some kind of chip involved?

 **xfnord** says: Oct 16, 2009. 1:04 PM [REPLY](#)
This is right. But the chip is not only switching the lights. It combines the colors and producing different colors through the whole color spectrum. This rainbow throwies are making more than just switching colors. They are projecting a whole light show with only one LED.


 **zacharias** says: Sep 27, 2009. 10:24 PM [REPLY](#)
This rainbow LEDs are based on three color lights and a chip which controls the light show.


 **nadina** says: Nov 11, 2009. 2:15 AM [REPLY](#)
to be precise its three chips with three lights


 **xfnord** says: Nov 11, 2009. 2:16 AM [REPLY](#)
thats true


 **rachelnoble87** says: Oct 14, 2009. 11:39 AM [REPLY](#)
I am going to try this. I ordered batteries off of cheapbatteries.com as you suggested, but I am worried that it may have been a mistake. Has someone ordered them from that website and received any email of confirmation and especially, did you receive the batteries you ordered?
I thought the website looked sketchy. Maybe I should have just gotten them at Walmart. :-/

 **mechanismango** says: Sep 26, 2009. 6:48 PM [REPLY](#)
So when it says it's a 1.8V - 2.4V LED will it still work with a 3V battery or what? Will it just burn out faster?
and of <http://www.kjmagmagnetics.com/products.asp?cat=17> or <http://www.gaussboys.com/magnets/discs/> which magnet is best? a 10mm by 2mm?

 **sclD** says: Oct 13, 2009. 3:53 PM [REPLY](#)
That voltage rating is for the LED itself. Basically, when it is turned on, there will be 1.8-2.4V across it. So, you need at least 2.4V for the LED to turn on (preferably a little more).
However, you usually don't want to have just an LED and a battery. You want to have a resistor in front of it, too (It's OK in this case because you're using a 3V battery with a 3V diode, so it's pretty close).
In your case, I would put a 30 Ohm resistor in series with the diode. The diode will drop 2.4V and the resistor will drop the other 0.6V. The resistor will cause about 20mA of current to flow through the diode, which should be enough to turn it on!


 **megghann** says: Sep 29, 2009. 6:44 PM [REPLY](#)
So are the magnets necessary if I'm just wanting to add LEDs to a costume (I'm new to this...so the lights will glow, without the magnet?)

 **bassclarinet23** says: Oct 13, 2009. 12:54 PM [REPLY](#)
Magnets are not necessary if you don't want it to stick to something. You only need an LED and a power source, though a switch would be useful if you want to be able to use the costume again (long term), plus it saves battery.


 **firezone** says: Oct 9, 2009. 9:46 AM [REPLY](#)
and you don't have to do the same as here, you could wire up a long line or web of LEDs and power it with a slightly bigger battery, that would take a lot less money and time

 **godofal** says: Oct 3, 2009. 9:24 AM [REPLY](#)
yes, LEDs only need power to light up ;)

 **bassclarinet23** says: Oct 9, 2009. 3:48 PM [REPLY](#)
Is it considered vandalism to put them in public places?

 **kingalex1** says: Oct 12, 2009. 8:48 PM [REPLY](#)
it doesn't harm anything. so I'd say no. but I'd check with your local laws etc. first

 **jumpertoad** says: Oct 11, 2009. 12:40 PM [REPLY](#)
they had this craft at the maker fair in 2007! you are famous!

 **bassclarinet23** says: Oct 9, 2009. 4:00 PM [REPLY](#)
Sorry for all of the questions, but do you have to use that tape? Could you use packaging tape?

 **Killer-SafeCracker** says: Sep 29, 2009. 5:20 PM [REPLY](#)
So how long will these last??

 **robdun** says: Sep 29, 2009. 11:11 PM [REPLY](#)
a few weeks.



007dna says:

I suppose you could buy rechargeable button cell lithium batteries, and just reuse them after use.

Sep 27, 2009. 9:49 AM [REPLY](#)



112251919112 says:

U do know, u can market these, its a million dollar idea!

Jul 20, 2009. 1:10 PM [REPLY](#)

[view all 1075 comments](#)