

Mini Maglite LED Hack

by [Radioactive_Legos](#) on June 21, 2008

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Intro: Mini Maglite LED Hack

I recently found a Mini Maglite flashlight in one of my dad's desk drawers. I replaced the old batteries and attempted to turn it on. As it turned out, the bulb was dead (at that time I didn't realize that I had a replacement bulb). I wanted it working and looking cool, so I went to Radioshack a few blocks away, got a SuperBright blue LED, did some fiddling, and ended up with this...



Image Notes

1. The LED's somewhere in there...

step 1: Gathering Materials

First thing you'll want to do is gather the tools and supplies for the project:

Tools

- Electric Drill/Drill Press
- Wire Snips

Parts

- Mini Maglite Flashlight
- SuperBright 5mm LED*

*I went to Radioshack and got a 5mm 2600 mcd SuperBright blue LED (catalog number 276-316 . I really don't like going to Radioshack because they mark everything up so much (\$4.49 for the LED at Radioshack, compared to \$0.33 for a similar one from Jameco), but if I need something quick or want to browse, it's okay.

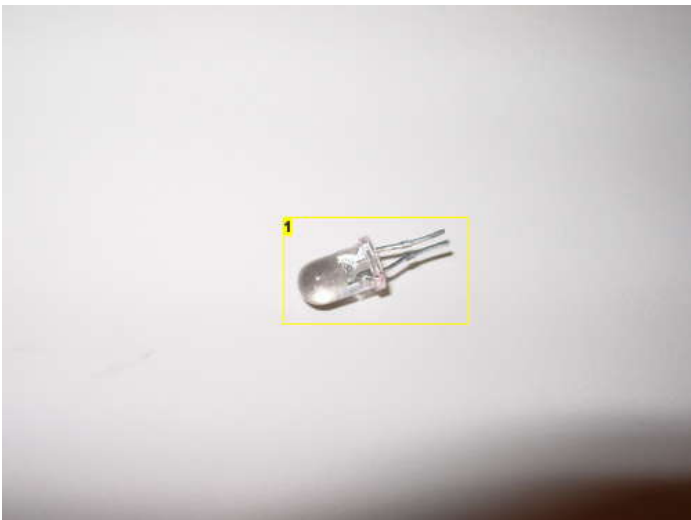


Image Notes

1. Nice little LED that's extremely bright.

step 2: Disassembly

Now we will disassemble the major components in the flashlight. These include the main handle, the batteries, the little screw-in thing in the back, the head, the reflector the front cap, and of course, the original bulb. No tools are necessary for this, it is all screwed together and easily comes apart.



Image Notes

1. Handle
2. Reflector
3. Wimpy bulb
4. Head
5. Front cap
6. Little screw-in thing in the back
7. 2 AA batteries

step 3: Light Comparison

Let's take a moment to compare the original bulb with our new LED. For one, the bulb is glass and is prone to breaking while out of the flashlight, while the LED is, for the most part, a solid hunk of plastic. In addition, the bulb heats up a lot really fast, while the LED will take a while to start warming up. Also, the LED is much brighter than the bulb and does not diverge as rapidly. It's pretty blue color catches attention and is very visible in the dark, as well as light. One thing I noticed later on was that the blue color of the LED is fairly near ultraviolet, so it lights up bright colors quite well, especially highlighters (Florescent dye, I suppose). Now let's get back to business, shall we?

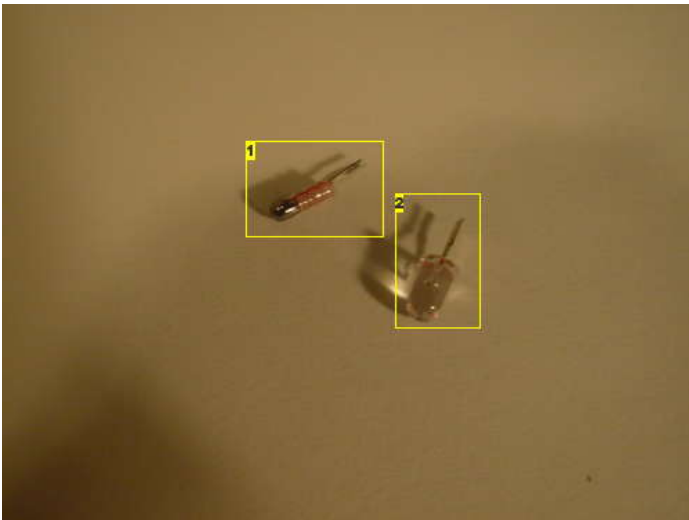


Image Notes

1. Old
2. New

step 4: Reflector Modification

For the LED to fit snugly in its new home, we will need to bore the hole out in the reflector wider. In my case, because I had a 5mm LED, I bored the hole out a bit larger. I would recommend a drill press for this job if you have one, but if you don't, you can use a standard electric drill.



Image Notes

1. Original bore diameter

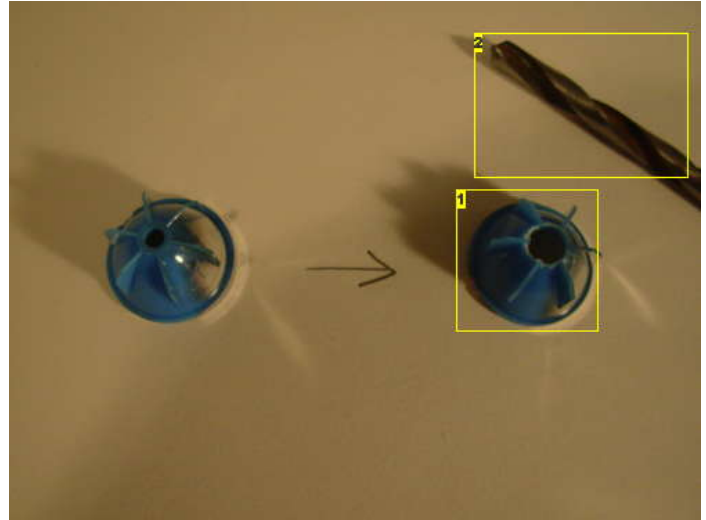


Image Notes

1. New bore diameter
2. Drill bit

step 5: Fitting the LED

Now comes the easy part (as if the rest thus far hasn't been). To make the new LED as nicely fitting as possible, we will cut the leads shorter. We don't want them too short, or else they might not contact the insides of the flashlight properly. I left mine at about 1 centimeter.

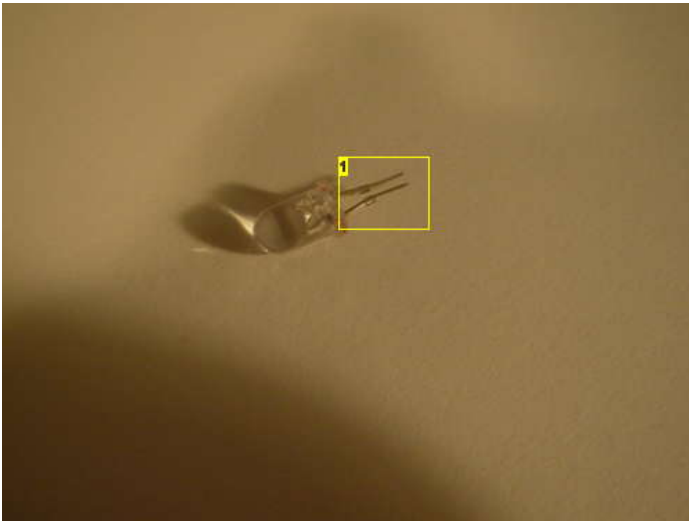


Image Notes

1. About 1 centimeter

step 6: Putting it All Back Together

Reassembly:

1. Put the batteries back in the handle so you can test for polarity and screw in the end piece.
2. Try the new LED in the two little holes (see image). If you got it right, the LED will light up (Duh). Keep the LED in its spot so you can fit things properly.
3. Place the newly modified reflector back where it came from in the head of the flashlight.
4. Screw the front cap on over the reflector and head. Don't forget the little clear plastic shield.
5. Screw the head onto the handle and turn it on again.

If you did everything right, you should end up with a very bright flashlight that is not good to point in anyone's eyes!



Image Notes

1. Screw this into the back end
2. Batteries go positive (+) first.



Image Notes

1. Holes that the LED leads fit into



Image Notes

1. Perfect!



Image Notes

1. Good

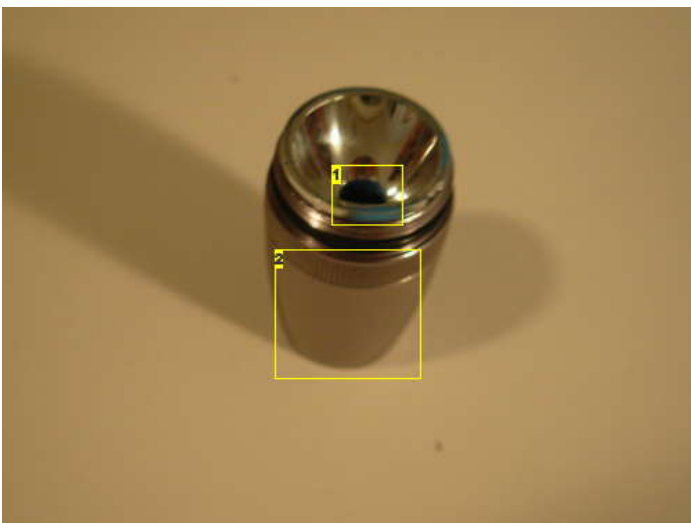


Image Notes

1. New hole...
2. ...In the head.



Image Notes

1. The Mini Maglite came with this protective rubber shield

step 7: Finished Comparison

The first picture shows the flashlight before, and the second shows it after the modifications (same with the front views)...

Have fun with your own!



Image Notes

1. Note how the light is partially focused here, but it really dissipates outward.
2. These are all for my brother's halloween display ;^)

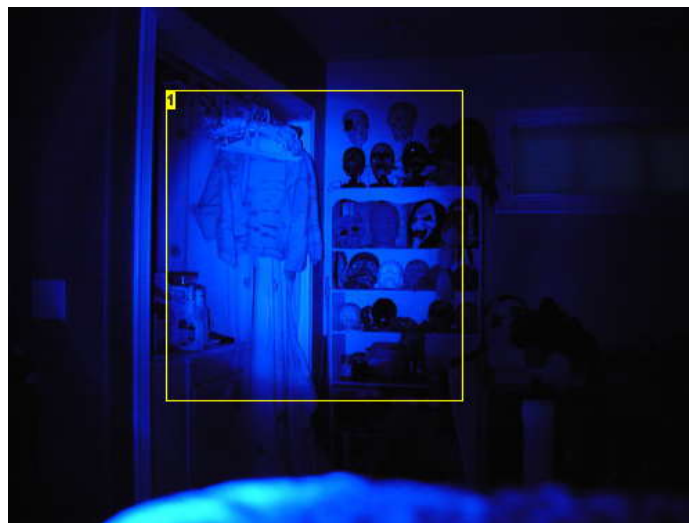


Image Notes

1. This new lighting is very consistent and visible

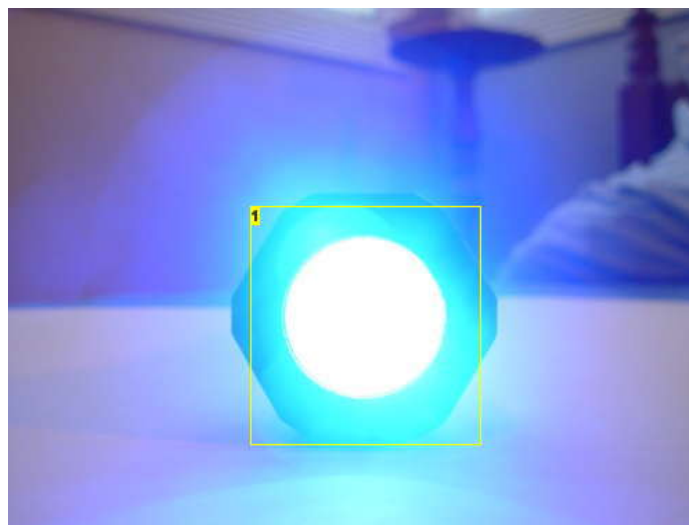


Image Notes

1. Extremely bright (the last picture and the current one had the same room lighting)!

Related Instructables



Mag-Lite Bike Lamp by werkzeuger



Laser Flashlight Hack!! by Kipkay



5 Minute Build #1 - LED Flashlight by Radioactive_Legos



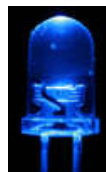
Mag-Lite LED conversion (any 2 or 3 xCell Flashlight) by erckgillis



Astronomer's red light (Maglite mod) by vincenc



make a mini mag smaller by poi12340



The LED: An In-Depth Guide by Coodude26



Make the world's brightest blue led flashlight by Frogz

Comments

45 comments [Add Comment](#)



djdehne says:

Oct 14, 2009. 10:01 AM [REPLY](#)

What is the advantage of using the 5mm led instead of using a 3mm? After a quick search it looks like a person can get a 3mm led that is just as bright as a 5mm. What is the approximate size of the original hole?



Radioactive_Legos says:

Oct 14, 2009. 1:50 PM [REPLY](#)

Well, I happened to have 5mm LEDs lying around, and for me they tend to be more powerful and accept a broader range of inputs. The original hole is approximately 3mm in diameter.



pryrofreak119 says:

May 25, 2009. 8:20 AM [REPLY](#)

i tried this once but it burned the LED out



Thenwcp says:

Jul 26, 2009. 6:52 AM [REPLY](#)

You needed a resistor to limit the current in the led.



thartaros says:

Oct 10, 2009. 6:12 PM [REPLY](#)

mine is the opposite i think. the LED is 3.3 volts, but the AA batteries r only 1.5 volts each. and the light isnt bright at all, barely enough to light up a room. also today my flashlight got very hot i was worried the batteris were gonna explode and blow half the city away :/



thartaros says:

Oct 9, 2009. 12:32 PM [REPLY](#)

i dont have drill so i had to use a drill bit and make the whole by hand :/ fits perfect though :D



lilpepsikraker says:

Jul 16, 2009. 8:59 PM [REPLY](#)

Oh, and I thought putting a Joule Thief into an AA case, so I can reuse "dead batteries". Has anyone ever done that?



lilpepsikraker says:

Jul 16, 2009. 8:57 PM [REPLY](#)

Lol, I went out and bought a Maglite 2AA just to do this. Best flashlight I've ever owned. Same color as yours, lol. Still waiting for my shipment of LEDs to come in, so I will post a copy of your instructable when i get mine in. You know, everyone on instructables does that.



team_nes_1986 says:

May 21, 2009. 2:03 PM [REPLY](#)

A couple of things:

1. Why is the anti-roll device/lens holder being used?
2. If you used one of those tiny 3mm LEDs, you wouldn't need to bore the reflector. I know this because in my own experiments, the LED I used was just big enough to fit through the original hole.



team_nes_1986 says:

May 21, 2009. 2:04 PM [REPLY](#)

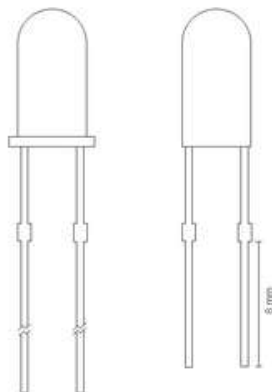
If you sand off the little flange around the LED base, it would fit even better.



dillee1 says:

Jun 3, 2009. 8:56 PM [REPLY](#)

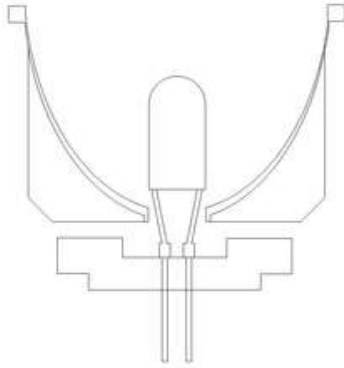
Indeed. 3mm LED only need the leads trimmed and shine filed. Resultant mod will be drop in replacement to original bulb. No drilling of reflector are needed. No current limiting resistor needed for blue/green/white LED.





dillee1 says:
Cut away view of base-LED-reflector assembly

Jun 3, 2009. 10:17 PM [REPLY](#)



wisd0m says:
This worked well for me. I used a 3mm Red LED that ran at 2.5v. Since I used the 3mm LED, I had to drill out less of the reflector.

May 27, 2009. 3:48 PM [REPLY](#)



Noodle god says:
Now you can have a IR or UV min-mag!
I just bored out my reflector with a knife.
I wanna make a UV one that would be cool!

Mar 12, 2009. 3:00 AM [REPLY](#)



amakerguy says:
I tried this and it fried my LED. :(

Dec 6, 2008. 1:17 PM [REPLY](#)



daelans says:
i cant get my led to fit in the little black holes
the wires are to far apart(it would appear, i know not much about flashlights, i mean duh, why else would i read your review, no offense)
help
good review tho

Jan 28, 2009. 2:41 PM [REPLY](#)



daelans says:
nevermind, i dont know how you guys did this but, my led worked then i drilled the whole and then i put it in, it didnt work. so i tried 2 other leds, they did not work either, well they work just so dim you might as well not really have it. then i put the regular light in it and it was bright as day (exageration) and now im out a mini mag

Jan 28, 2009. 2:43 PM [REPLY](#)



daelans says:
nvm my new unopened duracell batteries were not strong enough
i used some wicked wierd not common AA and its like 100000000000 times brighter than duracell
no duracell

Jan 28, 2009. 3:11 PM [REPLY](#)



Radioactive_Legos says:
Did you make sure it was a 3-volt LED? You could have been using a 1.7V or something similar.

Dec 6, 2008. 3:02 PM [REPLY](#)



amakerguy says:
I do not know I just salvadged it.

Dec 12, 2008. 8:58 AM [REPLY](#)



markymark1 says:
can this light detect blood, urine, semen, and saliva on clothing? Please help.

Nov 29, 2008. 9:10 PM [REPLY](#)



cornflaker says:

Dec 5, 2008. 1:05 AM [REPLY](#)

well if you shine torches with LEDs on a bench on an angle (like almost flat) then all the dust on the desk (you would be surprised how much there is) starts glowing white like in those CSI-like shows, but I don't know if it will actually detect bodily fluids. There is a chance though... Maybe someone else can elaborate on this (please reply to my comment cause I'm interested too)



markymark1 says:

Dec 5, 2008. 3:35 PM [REPLY](#)

From what some websites say, it can, while others say they can't. If they can, it means LEDs, Ultraviolet lights and black lights are on the same playing field. Seeing as how LEDs can cost less than 5 bucks and UV lights and black lights up to 20, they aren't the same. Plus you have to spray luminol or something on the things you want to inspect. I'm so confused.



cornflaker says:

Dec 5, 2008. 7:47 PM [REPLY](#)

Hmm with my limited research I would say that you would a UV light, but you can buy UV LEDs (and UV LED torches). And use something like luminol, how does luminol work though? Do you just spray it around the room or something? Or do you have to actually paint EVERYTHING with it? Also I'm presuming its a liquid...



markymark1 says:

Dec 6, 2008. 1:47 PM [REPLY](#)

so long story short, this Instructable will not be used for purpose of "scientific" research. on an episode of dexter, i saw him spray something on the carpet using one of those spray bottles. i guess the idea is that the mist is enough. oh well.



crowscankill says:

Oct 14, 2008. 3:41 PM [REPLY](#)

I have a maglite, and I fiddled with my flashlight, but how do you get the maglight lightbulb out? I tried pullin it a little, but I don't want to break something...



Radioactive_Legos says:

Oct 14, 2008. 7:28 PM [REPLY](#)

It comes out. Just try wiggling it side to side as you pull, it should pop out. The bulbs are very small and are made of relatively thick glass, so you should be fine.



crowscankill says:

Oct 15, 2008. 1:01 PM [REPLY](#)

Ok, I got it apart :D

Only problem is getting a new bulb... I have a blue one, but it takes 5v... And the yellow and green ones I have aren't bright.



Radioactive_Legos says:

Oct 15, 2008. 6:44 PM [REPLY](#)

I hate to say it, but for ease of getting the LED, you should probably go to radioshack. They have quite a few LEDs in different colors. I actually find that their superbrite white ones (they come in a 2-pack for around \$1.69) are the brightest for the money. Or, you could go to Rite Aid into their halloween section - I picked up a 4-pack of little finger flashlights, they have fiberoptic thingies on the ends which pop off easily. Best of all, the flashlights are very bright and the pack only costs \$3. The colors are white, blue, red, and green.



Colonel88 says:

Nov 27, 2008. 8:53 AM [REPLY](#)

YEAH i bought a super bright one for 5 bucks and it didnt work....



Radioactive_Legos says:

Nov 27, 2008. 8:59 AM [REPLY](#)

Did you check the polarity? It's hard to get an led to stop working unless out severely over-voltage or amp it. Just try turning it 180 degrees in the flashlight (just to swap the lead positions).



Colonel88 says:

Nov 27, 2008. 9:40 AM [REPLY](#)

yes it just doesnt go as bright as the other one



Rikasu says:

Aug 2, 2008. 3:04 AM [REPLY](#)

I ended up using an Ultrabright red LED, I found that it was brighter(in my case) and illuminated more detail.



Radioactive_Legos says:

Aug 3, 2008. 8:36 PM [REPLY](#)

That's good to know. After I made this Instructable I tried it with a SuperBright white LED from Radioshack. It, too is brighter than the blue one I used, but I still like the look of the blue LED.



craig4542 says:

Jun 27, 2008. 5:35 AM [REPLY](#)

This is a whole lot of work when you can go to Walmart and buy a LED conversion with a white LED for about \$5.



Radioactive_Legos says:

Jun 27, 2008. 8:40 PM [REPLY](#)

I realize that that would be easier in terms of work, but I already had this flashlight and LED, and I thought it would be fun to share what I made. And the whole thing could take you under 5 minutes to make if you have everything in front of you. It's also cheaper considering the price of gas (I don't know where you live, but here in the SF Bay Area it's as much as \$4.50 a gallon) to drive to Walmart and get the flashlight.



dchall8 says:

Jun 22, 2008. 3:28 PM [REPLY](#)

Any flash light Instructables are cool in my book.

Would you mind taking some close-ups of the place where the krypton bulb wires were and where the LED wires go (same place)? The only flash lights I'm familiar with are the regular fattie bulbs. Since this worked so easily, I'll have to look into the inexpensive krypton bulb lights. As you know LEDs come in all varieties, so this could be fun.

I just got a pair of LED flash lights at Sam's Warehouse. They came two to a blister pack for \$30. They are listed as 4-watt bulbs and they seem to be brighter than anything else I have, including my 3-watt Mag-lite. I am pleasantly surprised at the light output. Now we'll see how long the switch lasts.

One thing you'll notice when you look down into the reflector of the new LED lights is the reflector is very deep. This is apparently the secret for making the cheaper LEDs work. LEDs produce a directional light and the plastic dome helps disburse it. They tried to make highly directional bulbs but then the reflectors don't do anything. The solution seems to be to keep with the wide pattern disbursement LED and correct (columnate) with the reflector. It's better than trying to use the regular bulb reflector.



Radioactive_Legos says:

Jun 22, 2008. 6:35 PM [REPLY](#)

Glad you like it. I'll post more pictures soon, hopefully tonight (maybe a video, too. Thanks for commenting!



Fascion says:

Jun 22, 2008. 12:29 PM [REPLY](#)

As others have mentioned, I would also like to see something lit up rather than a flat wall.

Does the battery life suffer greatly with this mod as well?



Radioactive_Legos says:

Jun 22, 2008. 12:38 PM [REPLY](#)

I have not noticed much, if any change in the battery life; LEDs are pretty efficient.



Radioactive_Legos says:

Jun 22, 2008. 12:37 PM [REPLY](#)

I will try to get some new pictures, however right now I am waiting for my pictures to upload for my other entry, an underglow and lighting mod for my razor scooter.



microman171 says:

Jun 22, 2008. 1:47 AM [REPLY](#)

I think you needed to show something in the light, like a dark room... That was we could see the difference.



Radioactive_Legos says:

Jun 22, 2008. 8:10 AM [REPLY](#)

What do you mean by: "In the light, like a dark room"? I think you're talking about step 7.



microman171 says:

Jun 22, 2008. 12:11 PM [REPLY](#)

What I mean is to light something up so you can compare the two brightnesses.



trooperrick says:

Jun 22, 2008. 10:14 AM [REPLY](#)

I think he means something to make sure your autoexposure (if you used it) settings aren't making the LED seem brighter or something.

If you could just take a picture with both flashlight spots on next to eachother.