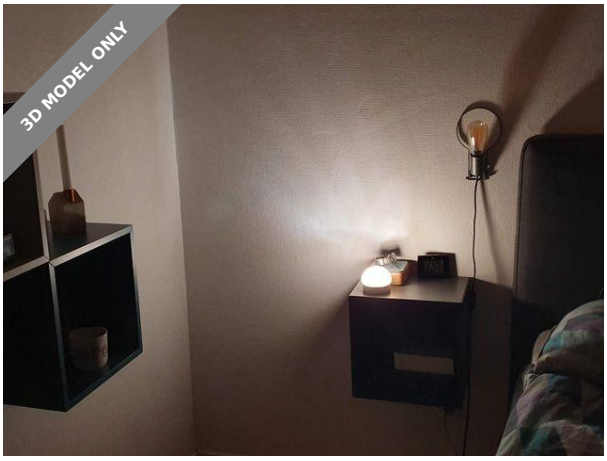

3D Printable Portable Night Light

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VIEW IN BROWSER

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Summary

Easy to make portable night light with wireless charging

Household > Other House Equipment

Tags: light wirelesscharger portable qiwirelesscharger nightlight

Print settings:

- Base + Base-Lid: 0.12 mm Layer Height, 20% infill, (I used Fiberlogy Light Grey Impact PLA), Supports needed on Base-Lid
- Dome-Lid: 0.12 mm Layer Height, 20% infill, Generic PLA, Supports not needed
- Dome: 0.05 mm Layer Height, White Anycubic Resin Print on Anycubic Photon (Gives a more even light than FDM print), Supports needed for resin print but not necessary for FDM print.
- Rubber-Ring: 0.16 mm Layer Height, White InnoFill 60 Flex @235C. Supports not needed.

This project is based on a practical need for a subtle night light in our bathroom that won't blind us and our newly born when turning it on.

It had to be easy and hassle-free to turn on and as there's no power outlet where it's placed, it needs to be battery-powered.

Those things combined turned out to be quite difficult to find off the shelf and those few I found were quite expensive and/or ugly. So I decided to go for it and make my own.

As inspiration for this project, I based it on a concept I created a couple of years ago; A cluster of small light-domes (3-4 cm-ish), portable and inductively charged, intended for mood lighting on warm summer nights or romantic evenings. I never really found a good way to implement that so they would be easy enough to charge or cheap enough to create a bunch of.

So the requirements I set up are as follows:

- Easy to turn on/off
- Not too bright
- Not too dim
- Portable
- Inductive charging

The lamp consists of five parts:

- Dome/Lamp Shade
- dome-Lid
- Base
- Base-Lid
- Base-rubber ring (to keep the base from sliding around on the table)

The base will hold a large battery for delivering power wirelessly to the Dome. I disassembled a small power bank for this.

On the Base-Lid I mounted an Adafruit Qi Transmitter

The Lamp-shade simply connects to the Dome-Lid and has no further active functionality than dimming the light of the Neopixel Ring.

The Dome-Lid contains most of the functionality.
I've mounted a Qi receiver, to charge a 1.000 mAh battery while on the charge-pad (Base-Lid).

To run the thing I'm using an Adafruit Trinket M0 and an Adafruit 24 Neopixel Ring (Warm White) to light the whole thing up.

(Btw: This is not sponsored by Adafruit, their components just fit the BOM quite nicely ;-))

As I wanted the lamp to light up both while sitting on the charge-base and while carrying it around, I added a small "switch" made up of adding copper-tape to the bulges on the turn-ring of the Base-Lid.

To connect the copper-tape I also added a couple of pieces of copper-tape to the Dome-Lid, wrapping around the edges of one of the holes in the inside ring of the Dome-Lid.
I soldered wires from those pieces to the Trinket V+ and Pin 4.
This way, the dome can turn into positions where it's either connected (off) or disconnected (on).

The code tells the Trinket to light up, when it's not connected, and turn off when it's connected.

This way, I can remove it from its base, and it'll light up since the switch isn't connected.

And a simple rotation of the Dome turns it off.

Outcome:

Looking at the finished product, I must say it's much better than anticipated. I expected a light that I could use only once in a while, but in fact, I now use it all the time. It's a much more pleasant light so you won't get blinded when turning on the light in a pitch black room.
I've even ordered more Warm White Neopixel rings to make more Light Orbs! My girlfriend and I both need extras to be placed at our bed, (though slightly dimmer)

So all in all, this turned out to be one of my best projects yet! A huge success!

Future upgrades:

- I'd probably switch the Trinket to an ATTiny85 for a more low power model.
- I'm considering a better way to charge the base unit.
- I'm not too happy with the base. Though it simple and does its job nicely, I'd like a sleeker design

Other:

I know that the Trinket is not ideal for this functionality and that cutting power to the electronics is much more power preserving, but this is what I could come up with with what I had laying around.
And as it works extremely well for our intended use I'm pretty happy with the result! :-)

I've made a few different lampshades, in different sizes and shapes, though for now, the Dome is the only one shared, as the others don't allow for light to shine through properly, and I haven't had time to edit them yet.

If you'd like a different kind of lampshade, feel free to ask, and I'll see what I can do :-)

Model files

rubberring-2.stl

base-2.stl

dome-lid.stl

base-lid.stl

dome.stl

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