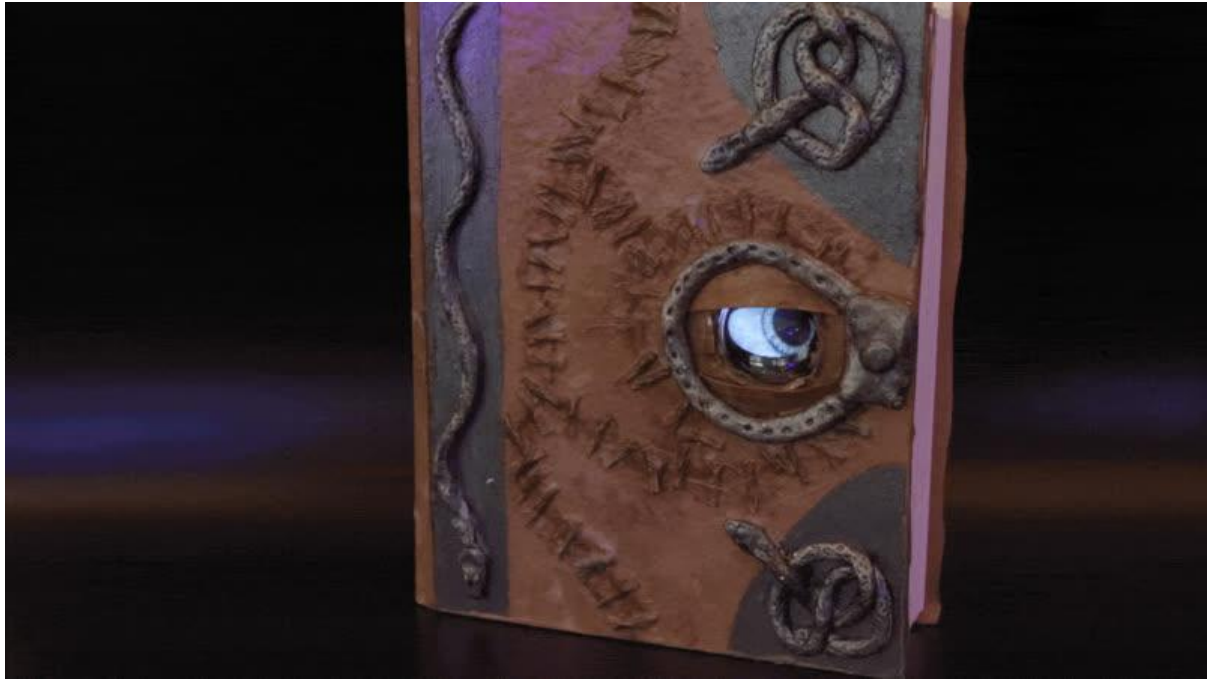




Hocus Pocus Book - Hallowing Eye

Created by Ruiz Brothers



<https://learn.adafruit.com/hocus-pocus-book-eye>

Last updated on 2022-10-04 11:08:04 AM EDT

Table of Contents

Overview	3
<ul style="list-style-type: none">• Prerequisite Guides• Tools	
Circuit Diagram	6
Spooky Eyes	7
<ul style="list-style-type: none">• Customizing the Spooky Eye Demo	
Assemble	9
<ul style="list-style-type: none">• Painting book covers• Sanding• Base coat• Snakes• Eye hole• Silver coat• Stitch detail• Mod Podge pages• Chipboard backing• Board outline• Test fit cutout• Glue Backing• Stiches• Glue Snakes and Lock•• Stitch layer• Eye lids• Page details• Attach spell pages• Trim card stock• Velcro / Hook and loop• Apply to Screen Bezel• Finishing mod podge coat• Complete!	

Overview



Use an Adafruit HalloWing M0 Express to build this iconic spell book!

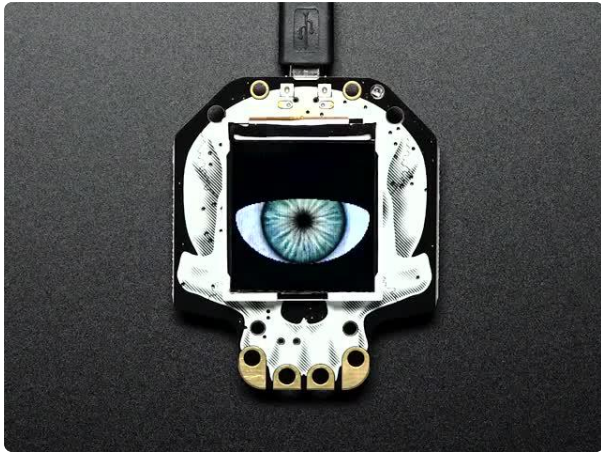
We've waited 300 years, right down to the day, now the witch is back and there's hell to pay!



In this project we'll put a spell on you and use our witchcraft powers to build our very own book.

If you don't believe, you'd better get superstitious.

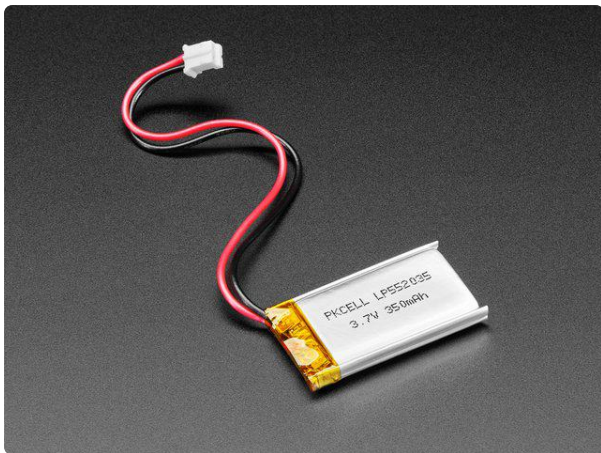




Adafruit HalloWing MO Express

This is Halloween..this is Halloween...
Halloween! Halloween! Are you the kind of
person who doesn't...

<https://www.adafruit.com/product/3900>



Lithium Ion Polymer Battery - 3.7V 350mAh

Lithium-ion polymer (also known as 'lipo'
or 'lipoly') batteries are thin, light, and
powerful. The output ranges from 4.2V
when completely charged to 3.7V. This...

<https://www.adafruit.com/product/2750>



Convex Plastic Lens with Edge

The eyes have it! Add this little lens to
make a big expression with our Spooky
Eyes demo for microcontrollers or
Raspberry Pi. These are plastic lenses,
with brilliant clarity and a...

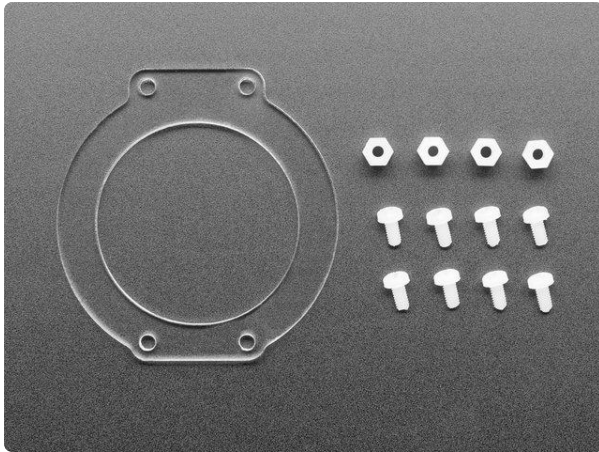
<https://www.adafruit.com/product/3917>



Convex Glass Lens with Edge - 40mm Diameter

The eyes have it! Add this little lens to
make a big expression with our Spooky
Eyes demo for microcontrollers or
Raspberry Pi. These are gorgeous glass
(not plastic/acrylic!)

<https://www.adafruit.com/product/3853>



Clear Acrylic Lens Holder + Hardware Kit for HalloWing

Here is the perfect kit for mounting a convex lens (glass or plastic) to your <https://www.adafruit.com/product/4013>

Prerequisite Guides

If you're new to Adafruit Hallowing, Circuit Python and soldering, take a moment to walk through the following guides to get you started.

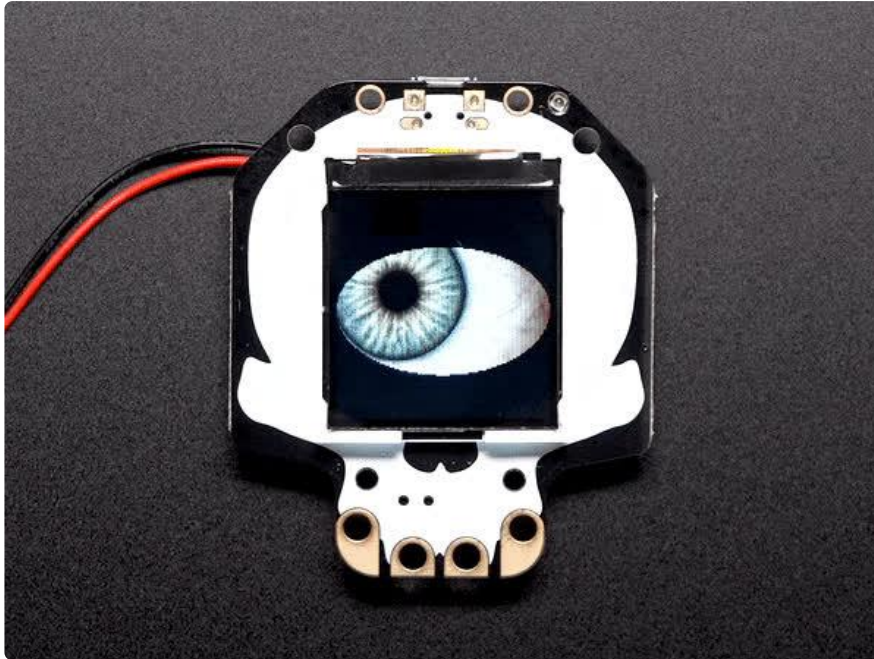
- [This is Hallowing \(https://adafru.it/CwH\)](https://adafru.it/CwH)
- [Welcome to Circuit Python \(https://adafru.it/cpy-welcome\)](https://adafru.it/cpy-welcome)

Tools

A list of helpful tools used to make this project.

1 x 1 – 3/8in Spade Drill Bit	http://a.co/d/hb8nlf
1 – 3/8 in Spade Drill Bit for Lens opening	
1 x Crayola Air Dry Clay	http://a.co/d/hG5jYS1
Crayola Air Dry Clay for snakes	
1 x Mod Podge Acrylic Sealer - Matte	http://a.co/d/cLI0k0L
Mod Podge Acrylic Sealer - Matte to glue and seal parts	
1 x 5M Burlap Twine	http://a.co/d/a1v90C9
5M Burlap Twine for the stitches	
1 x Tulip Soft Fabric Paint	http://a.co/d/gN71UY
Tulip Soft Fabric Paint Metallic Paint	
1 x Acrylic Paint	http://a.co/d/gDqbMTo
Acrylic Paint	

Spooky Eyes



Hallowing ships with a pre-loaded example of a human eye that looks around, blinks and reacts to light.

If you want to put the original spooky eye demo back on your Hallowing, [enter bootloader mode by double-clicking the Reset button \(https://adafru.it/C8r\)](https://adafru.it/C8r) and then drag this UF2 file over onto HALLOWBOOT:

Spooky_Eye_Human.UF2

<https://adafru.it/CmU>

There's a few customized variants as well, such as a fiery dragon eye:

Spooky_Eye_Dragon.UF2

<https://adafru.it/CmV>

A brown, animal-ish eye with no visible sclera:

Spooky_Eye_NoSclera.UF2

<https://adafru.it/CmW>

A psychedelic eye from our [Eye of Newt guide \(https://adafru.it/Cmd\)](https://adafru.it/Cmd):

Spooky_Eye_Newt.UF2

<https://adafru.it/CmX>

And a Terminator-inspired robotic eye:

Spooky_Eye_Terminator.UF2

<https://adafru.it/CFf>

Customizing the Spooky Eye Demo

The software controlling Halloween's eye is extensively customizable. This requires some familiarity with the Arduino IDE and, depending on the extent of customizations you have in mind, perhaps some image editing and using Python scripts on the command line.

This is all explained in the "[Electronic Animated Eyes using Teensy 3.1/3.2 \(https://adafru.it/j6B\)](https://adafru.it/j6B)" guide (despite the name, it also works on various Adafruit "M0" and "M4" boards as well, including the Halloween).

Most of the code there will automatically work on the Halloween hardware, such as the display and light sensor. Other Halloween-specific features, such as the capacitive touch pads, are not handled by the code...but could be added if you've done some Arduino programming before.

Assemble

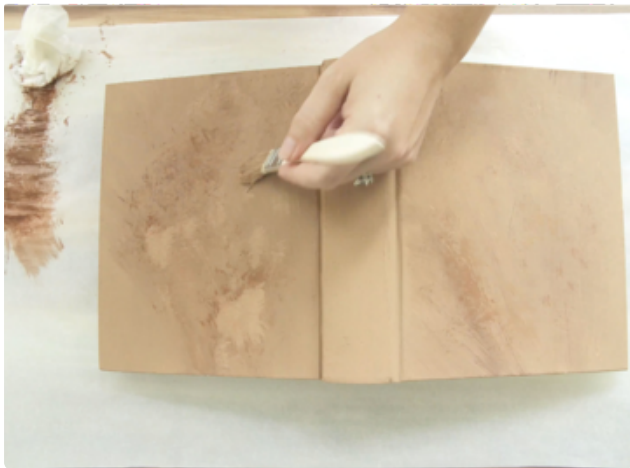
Painting book covers

First we'll need to select a large sized cook book that can house our board, lens and battery. Our book measured 8x9.5x2.5 inch (230mmx250mmx65mm). The pages and cover that will hold the Halloween in place need to be at least 1.5mm thick. This includes the thickness of the velcro / hook and loop that will attach between the cover and pages.



Sanding

Next we'll need to sand the covers to make painting easier. We used a 220 grit sand paper and lightly sanded the front and back covers to remove the glossy finish.



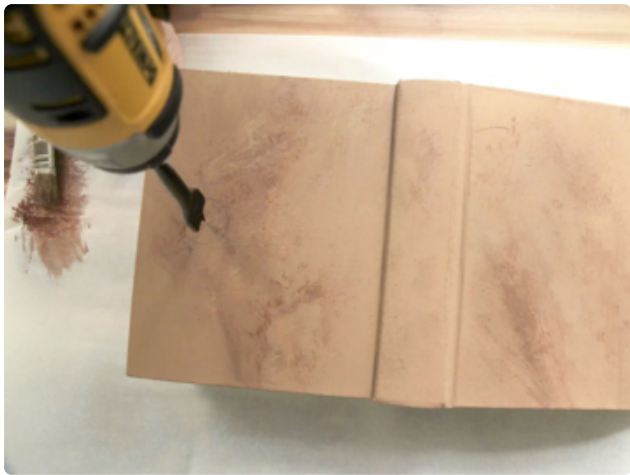
Base coat

For the base color, we used a light brown acrylic color to coat the covers. Allow the paint to dry and then apply a darker brown as a texture.



Snakes

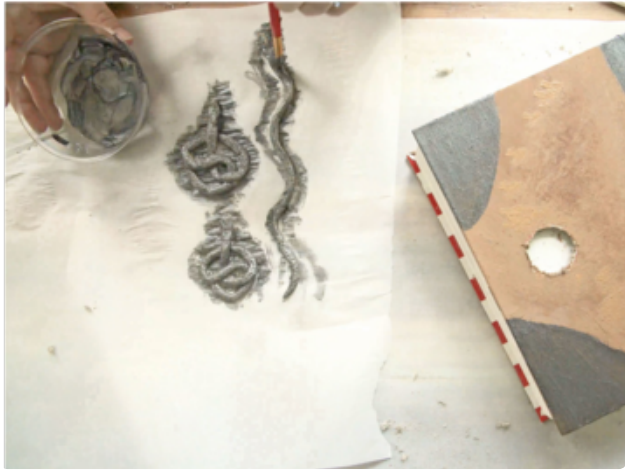
While we allow the paint to dry, we can get started on the snakes! Use air dry clay to mold, shape and texture the three snakes that adorn the front cover.



Eye hole

To create the hole for the [Convex Glass Lens](https://adafru.it/CBn), (<https://adafru.it/CBn>) we'll need to use a 1 3/8 inch spade bit to drill out the opening. Use a hobby knife to clean up the edges.



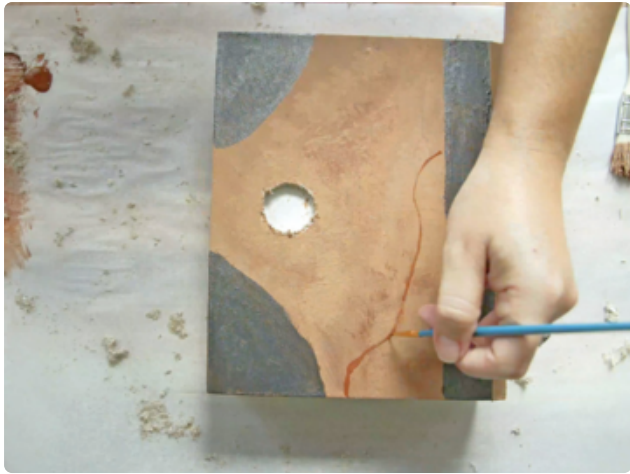


Silver coat

After testing the lenses properly fit through the cover, we can move on to painting the snakes and applying a silver coat to the covers.

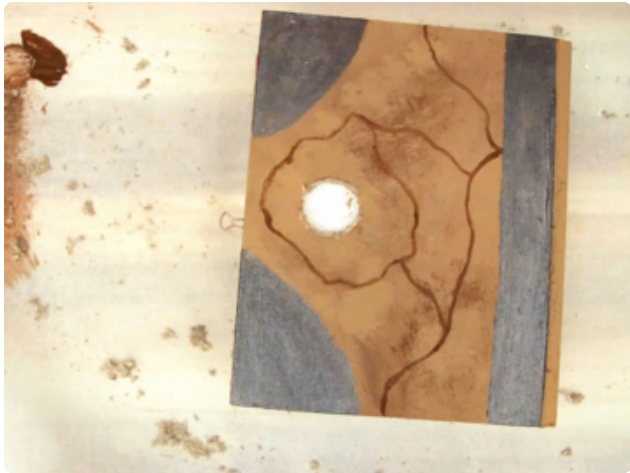


Allow the cover and snakes to dry before aligning them to the cover. Check placement and add additional silver coats to the cover and match the design with the snakes on top.



Stitch detail

Use the dark brown paint to lightly draw the line details that will make up the stitches. Don't worry if you make a mistake, we can easily dry brush it away to make it into the skin texture.



Mod Podge pages

After the stitch detail dries we'll move on to gluing the pages that hold the Halloween board in place. You will need about 1.5mm (about 80 pages) to firmly hold the board. Mod podge each page and then use a binder clip to hold them together while they dry.



Chipboard backing

After the pages dry, we'll trace out the circle cutout to allow ourselves to center the outline of the Halloween board on chipboard or card stock. This will help to cover up the mod podged pages.



Board outline

Next, we'll create an outline of the Halloween board and trace it onto the mod podged pages. Use a hobby knife to carefully cut out each page.





Test fit cutout

Place strips of velcro around the page boarders and then place the board and Convex Glass Lens on top of the display and carefully close the book cover to test out our tolerances.



Do not apply pressure to the display, the board or the battery (too much could damage the screen or battery, be careful!).

Clean up any jagged edges and around the cover to properly fit the parts.

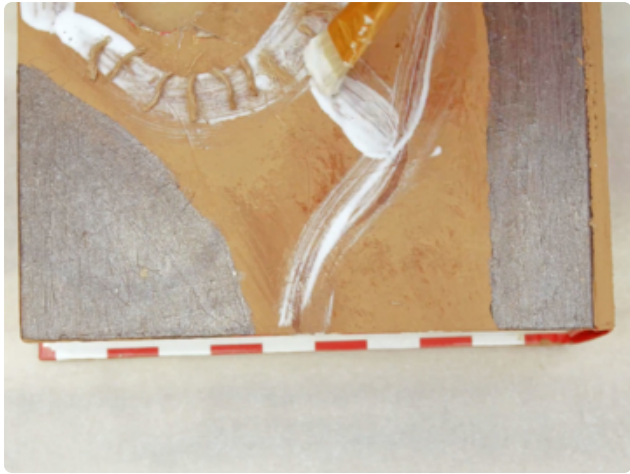


Glue Backing

After we clean up all edges and test that all of our parts fit, we'll move on to adding mod podge to the backing card stock.



Use a small binder to help keep the pages together while they dry.



Stiches

On to adding stitches! We'll first prepare the surface by tracing the details with a thick layer of mod podge (adds depth). Use a brush to apply mod podge along the lines we drew earlier.



Now we'll cut about 50 pieces of twine. We'll cut them 20mm long and randomly place them over the glue lines.

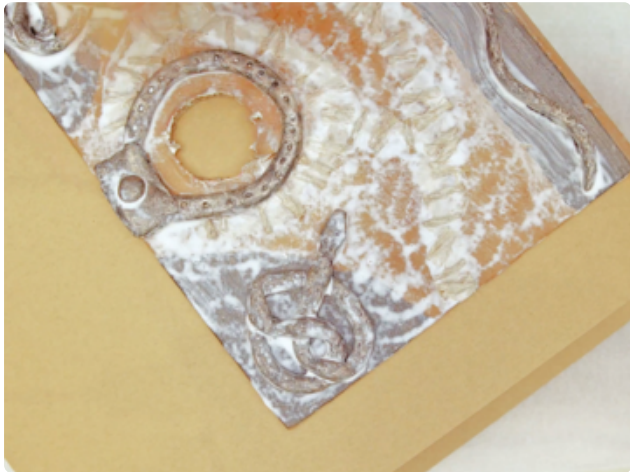


Glue Snakes and Lock

We used super to attach the snakes and lock parts into place and sealed with a thick coat of mod podge.

Stitch layer

Once we're happy with the layout we can apply a coat of thick mod podge on top of the twine to keep the fibers clumped together.



Allow the first mod podge layer to completely dry and then apply a second "skin layer" by applying small clumps in the form of wrinkles.

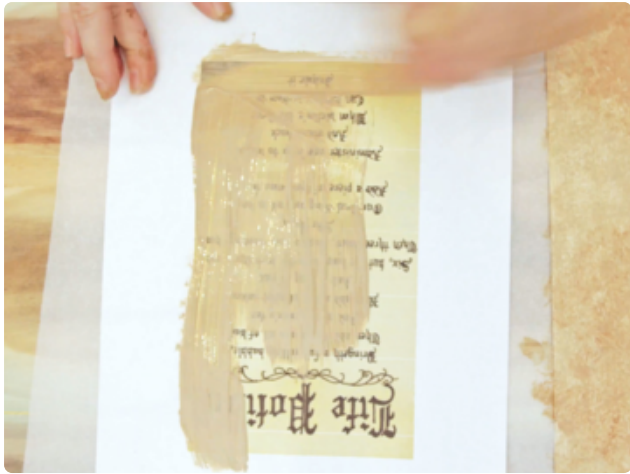


Eye lids

To make the eye lids, cut out 1/2 moon shapes until it fits inside your lock (~54mm inner diameter lock). We'll shape and mod podge the lids to the top and bottom of the inner lock.



Allow the mod podge to fully dry before applying an additional skin layers, like we did before.



Page details

Find pages to print by searching on google for "free printable spell book pages"

Print out spell pages and then apply a mixture of light brown paint and mod podge. After it dries, we'll apply textured brush strokes using a darker brown color. We'll try to apply it around the edges to make it appear aged. Use a dry paper towel to apply darker brown for a textured look.



Attach spell pages

To increase the structure of the spell pages, we first glued card stock to the pages in the book and then apply more mod podge the spell pages on top of chipboard.



We used cards tock that is bigger than the spell page so we can mod podge all of the edges to prevent them from curling. This also covers up uncovered areas (like the original text from the book).



Trim card stock

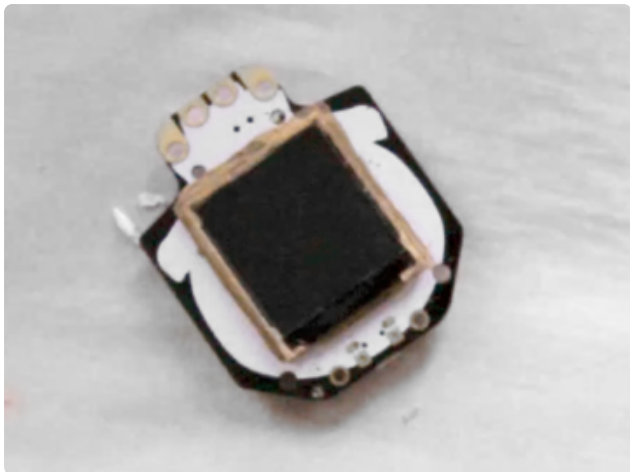
Once our spell pages are fully dried, we'll go ahead and trim off the excess and cut away at the Convex Glass Lens opening with a sharp hobby knife.





Velcro / Hook and loop

Now we can stick our velcro / hook and loop that we traced earlier, to enable easy access to the Hallowing.



Apply to Screen Bezel

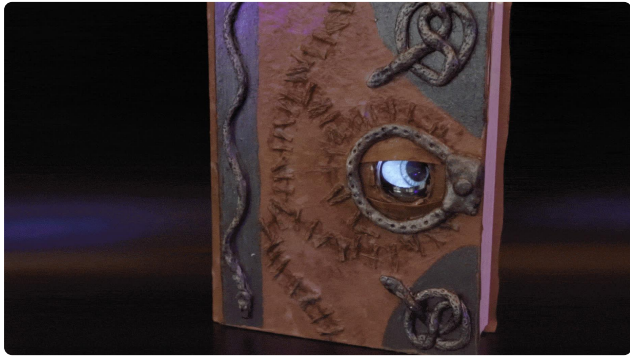
The framing around the display is white and will show up when we place the lens on top. Use light brown paint to cover up the white areas. Leaving the protective film over the screen on will help mask it while painting.



Finishing mod podge coat

Almost there! To create the final skin texture and to lock every thing in place, apply a thick uneven layer of mod podge and allow to dry.

We allowed ours to completely dry over night, for about five hours.



Complete!

And that's it! You can now cast spells on people as they get hypnotized by the eye movements!