# The Great Seal Mask

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https://learn.adafruit.com/the-great-seal-mask

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# Overview

This quick and easy project (https://adafru.it/UeT) uses the Adafruit HalloWing to create a creepy Halloween mask from the seal found on the back of the one dollar bill (https://adafru.it/CUb).

The Great Seal was first designed in 1782, and has been printed on the back of the one-dollar bill since 1935.

The phrase Novus ordo seclorum (Latin for "New order of the ages") appears on the reverse side of the one-dollar bill, (https://adafru.it/CUb)along with the phrase Annuit cœptis, literally translated as "[He/she/it] has favored our undertakings".

An old pair of sunglasses (with lenses removed) or a headband can be used to hold this mask to the face.

## The Electronics

Adabox 009 has all the parts listed below

**1 x** Adabox 009 — https://www.adafruit.com/product/3956

Adabox 009 has all the parts listed below

- or -

**1 x** HalloWing — https://www.adafruit.com/product/3900

The Adafruit HalloWing is a skull-shaped ATSAMD21 board with a ton of extras built in to make for an adorable wearable, badge, development kit, or the engine for your next cosplay or prop

**1 x** Micro USB cable — https://www.adafruit.com/product/592

Standard A to micro-B USB cable - 3ft

**1 x** Lithium Ion Polymer Battery — https://www.adafruit.com/product/3898

This battery has a capacity of 400mAh for a total of about 1.9 Wh

**1 x** Convex Plastic Lens - 40mm Diameter — https://www.adafruit.com/product/3917

Add this little lens to make a big expression with the Spooky Eye demo

## Tools & Materials

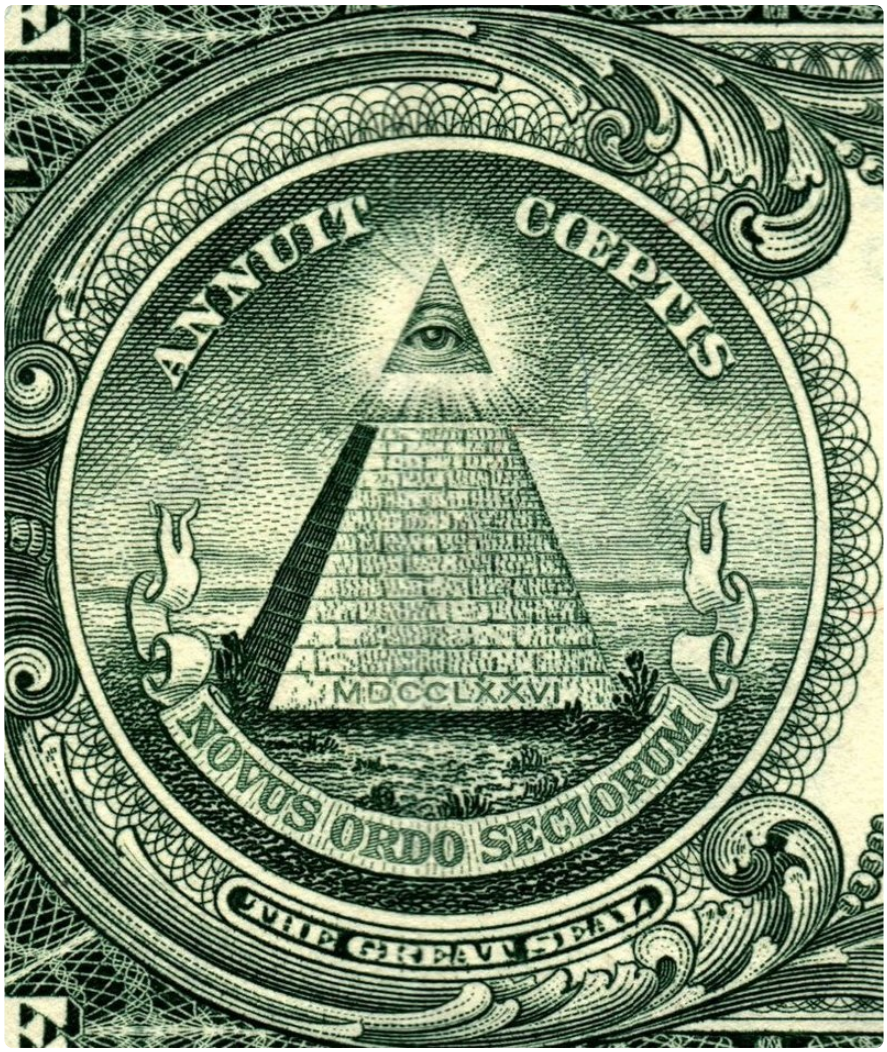
- Paper + color printer
- Scissors or hobby knife
- Cardboard (about 12" x 12" square)
- Rubber band
- Hot glue gun
- Fine-tip tweezers
- Old sunglasses (or headband)

# Make the Mask

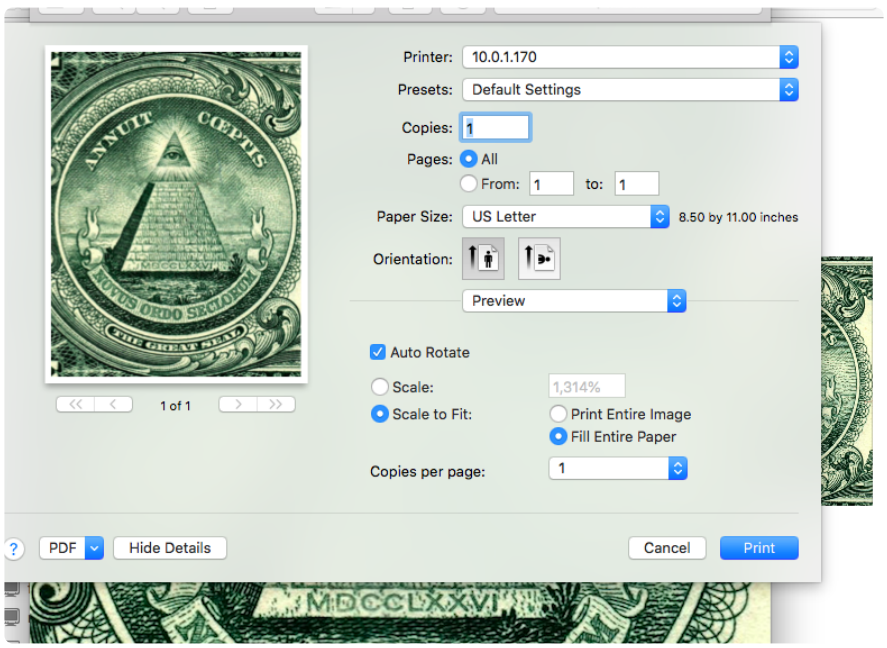
To start, you will want to print the PDF of image, you can download via the link below:

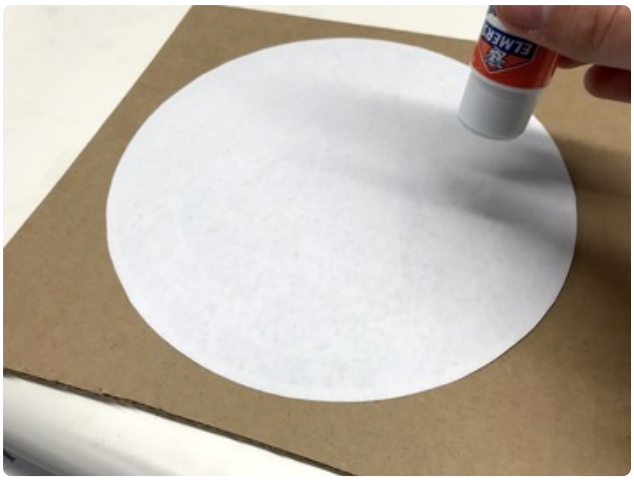
**TheGreatSeal.pdf**

https://adafru.it/CTd




Print the image as big as possible, such as entire page of paper (8.5"x11", A4, etc.)





## Cut out Seal

Cut out the circle, following the line around the seal.

Glue the seal onto a piece of cardboard.

Let it sit for about 10 minutes to dry.

## Attach to Cardboard

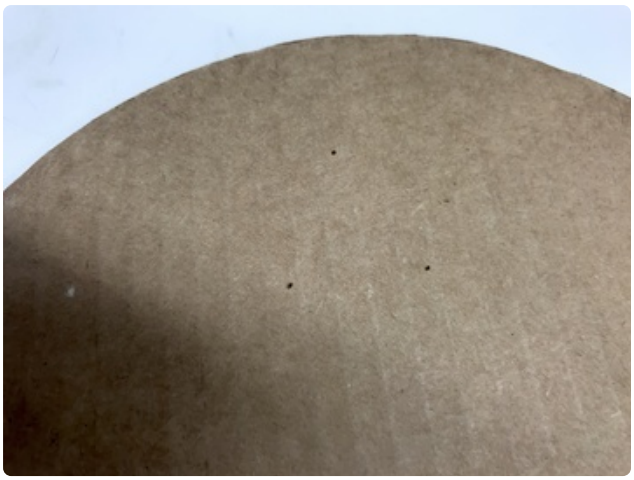
Cut the cardboard around outline of the seal.

Now your seal is ready to turn into a mask!

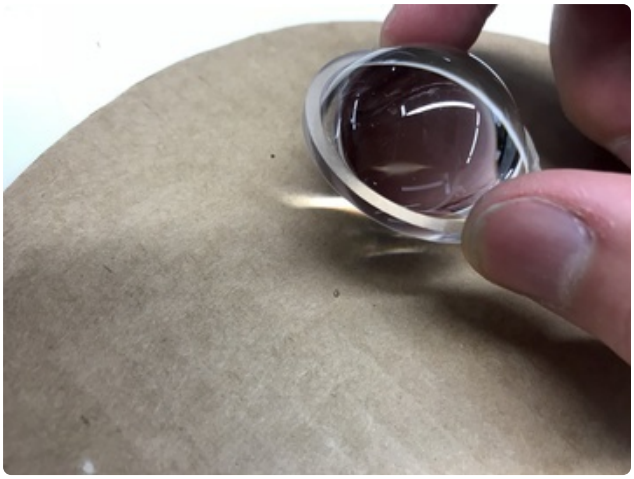
## Alignment

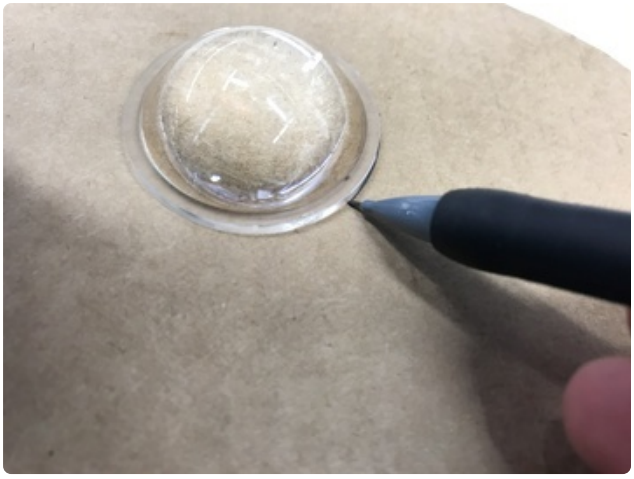
Poke three holes at the corner of the triangle. These will be used for alignment.

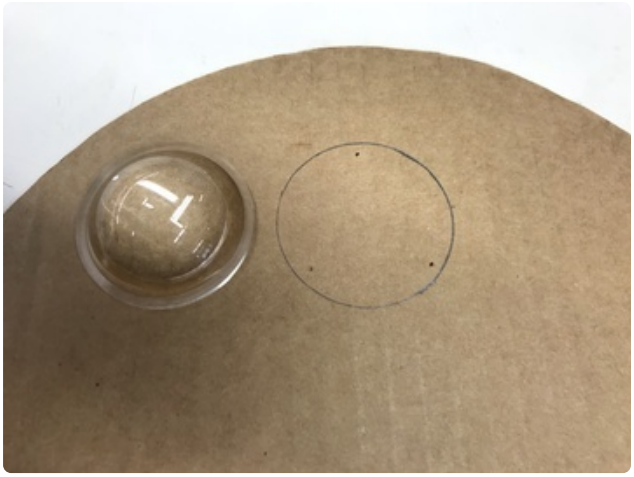
Align the lens on the back of the cardboard using the holes. Make sure the lens is equally spaced around the three holes.

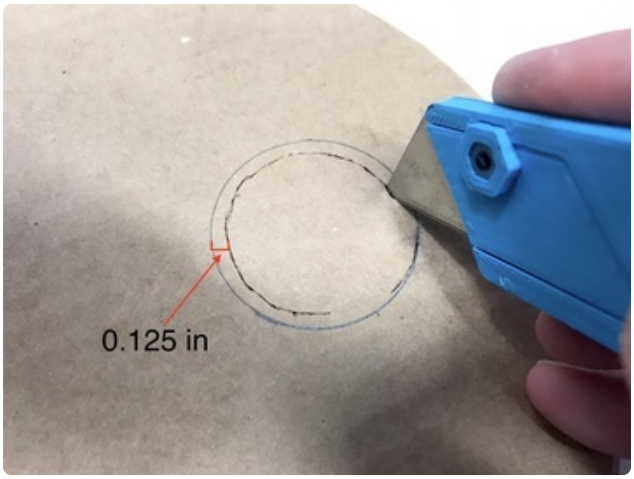


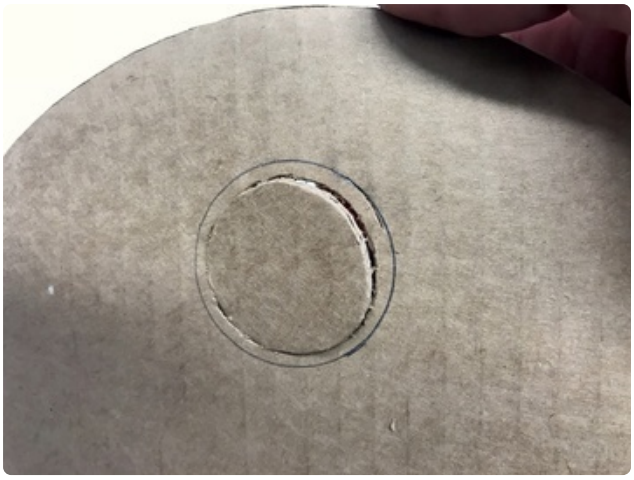
Holding the lens in place, mark its outline with a pen or pencil.









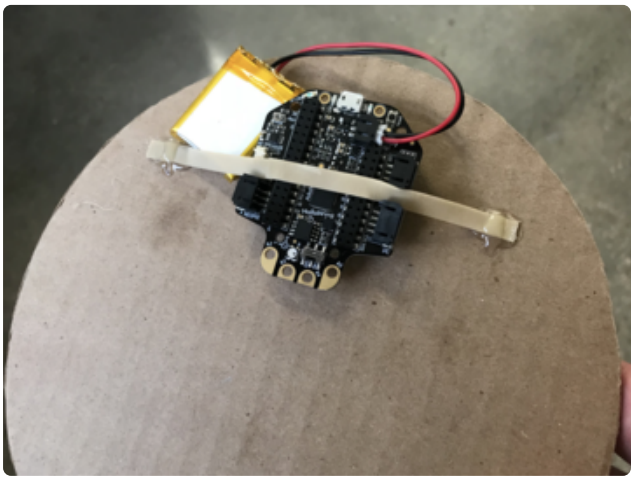
## Mount the Lens

Cut a hole offset about 1/8" INSIDE the circle you drew.

Glue the lens in place with some dabs of hot glue.

## Spooky Eye

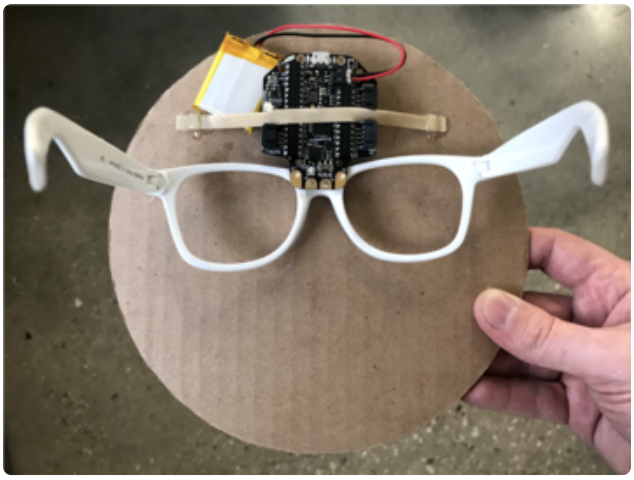
Once the lens has been glued in place, it's time to add some electronics.

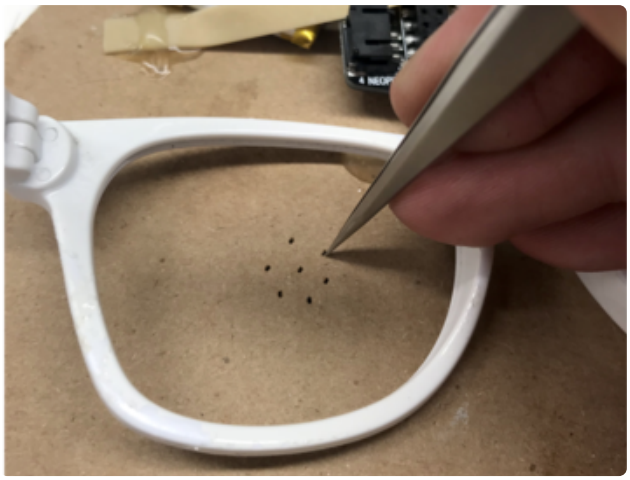


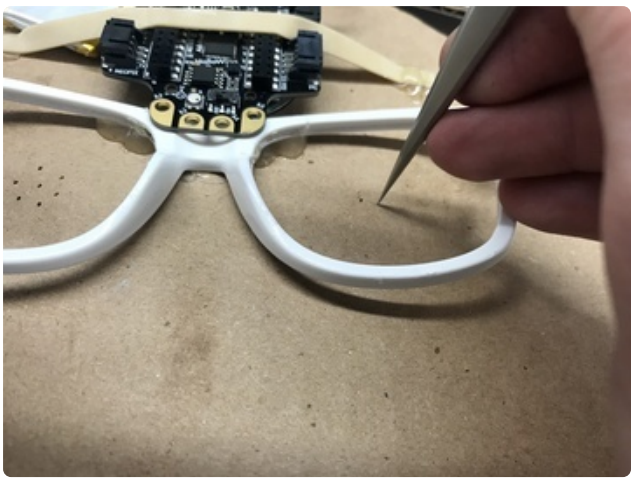
## Rubber Band

Cut a rubber band in half and trim a 4 inch section off of it.

Glue this length of rubber band across the back of the lens. This will hold the HalloWing in place.







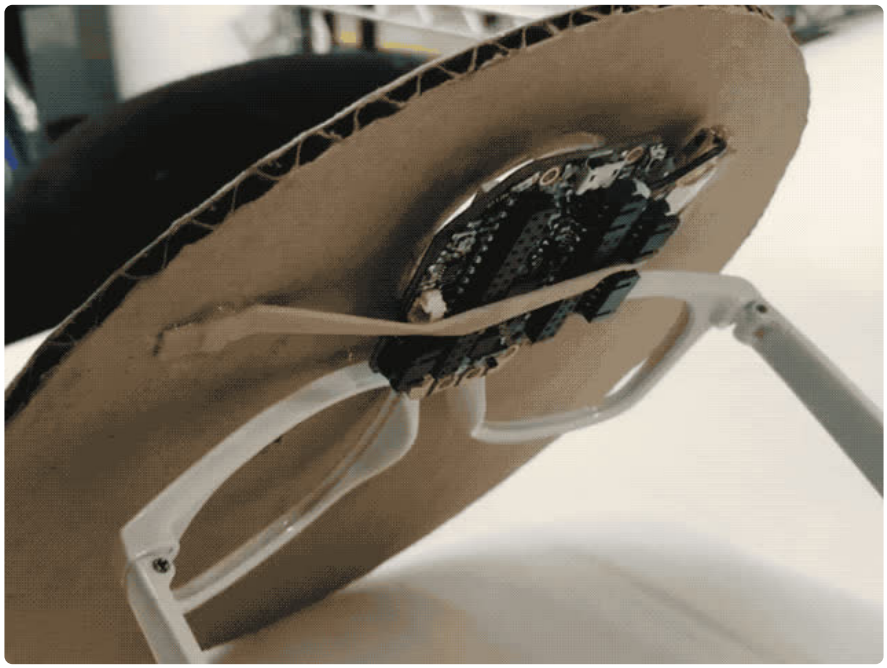
## Make it Wearable

Attach an old pair of glasses from which the lenses have been removed.

Place a few large dabs of hot glue around the bridge of the glasses. This should hold the glasses securely in place for the mask.

Poke holes where your eyes will be. These will allow you to see through the mask and navigate your surroundings.

The power of the human visual cortex is able to construct an accurate map of your surroundings based on even minute information coming in from the eye, so you may be surprised how few holes you need in order to be able to see.



## Changing the Eye

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 different spooky eyes on your HalloWing, enter bootloader mode by **double-clicking the Reset button** and then drag the appropriate UF2 file over onto **HALLOWBOOT:**

The UF2 files for different eyes can be found at this link (https://adafru.it/CEs).

Drag and drop the .UF2 onto the **HALLOWBOOT** drive on your computer. It will eject automatically (you may get a warning from your computer, you can ignore this).

## Customizing the Spooky Eye Demo

The software controlling HalloWing'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. Customization, therefore, is more of an intermediate-level project.

This is all explained in the Electronic Animated Eyes **(https://adafru.it/j6B)**guide

Most of the code there will automatically work on the HalloWing hardware, such as the display and light sensor. Other HalloWing-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.