

# Solar Eclipse Mask Activity Preparation

Updates were added on 9/21/23.

Latest file is routinely uploaded to: [asterionfoundation.org/sema](http://asterionfoundation.org/sema)

## Gather Your Materials

<i>Thousand Oaks Optical</i> Silver-Black Polymer filter material, bulk roll (100' creates ~960 filters)	ROLL-SBP-100	100 ft. (1)	\$320
<i>Fiskars</i> SureCut™ Deluxe Craft Paper Trimmer - 12" Cut Length - Craft Paper Cutter with Grid Lines (or similar)		1	\$28
White Cotton Gloves, 10 Pair (per size), Lucky SLD, for Art handling Crafting Coin Jewelry Silver Inspection	Amazon	1	\$9
3" x 5" Index Card Holder Pink Card File Box Organizer, Holds 1200 3x5-Inch Flash Cards (or similar)	Amazon	1	\$10
Index cards, 3" x 5" (any style) (plain office scrap paper is fine but not newsprint or magazine scrap)	Any office supply store; look for sales	1,000	\$10-20
Rubberbands (a handful)			
110 lb cardstock, plain white	Any office supply store	1,000	~\$62
<i>Avery</i> Easy Peel Printable Address Labels with Sure Feed, 1-1/3" x 4", White, 1,400 Blank Mailing Labels (optional)	Amazon	1	(\$31)
Masking tape, 1-inch, contractor grade, 60 yd, 9 rolls	Amazon	1	\$19
Craft Sticks, Colorful Jumbo, 30 ct. (or similar but the larger the craft stick, the better)	Michael's: MP661932	12 x 3 (\$31 ea)	\$93
Safety scissors (price will depend on quantity and quality)	Amazon	12 - 24	\$10 - \$50
Crayons and/or colored pencils (but <u>not</u> markers)			
<i>Fiskars</i> 193800-1001 Paper Circle Cutter with 3 Replacement Blades, Orange (optional but highly recommended)	Amazon	(1+)	(\$18+)
Ruler and/or sturdy, non-slip straight edge (recommended)		(1+)	(~\$12)
X-Acto knife (with replacement blades)		(1+)	(\$10+)
Microfiber eyeglass cloth (recommended)		(1+)	(<\$10)
Small envelopes (recommended)			

Concerning the materials noted above:

- The solar filter material is exactly the same as used in eclipse glasses and card viewers sold and distributed throughout the United States. *Thousand Oaks Optical* is a reputable company in this industry. This material was chosen for durability among other attributes.
- Cardstock: 100-110 lb is preferable. These masks are intended to be rigid (masquerade style, not wrap around masks) and to be used outdoors.

- The Avery labels can be printed from a preformatted file (included in the zip file) that can later be affixed to the back of each mask before sending them home.
- Mask-makers are satisfied with using masking tape only; no glue. Previous editions suggested Elmer's glue for the craft stick portion but this is now discouraged unless you are wanting to add additional elements such as pipe cleaners, "craft gems", etc.
- Fiskars circle cutter: cutting out the eye-holes for the masks is not the easiest of tasks but this product gives excellent results. Unfortunately, this cutter is not meant for children to use. Please read the details later in this document before deciding to invest in this product.
- X-Acto knife – handy for several reasons, but especially useful for a few mask templates that have a view window instead of "eyes".
- Small envelopes: if your program is open-ended on timing, you might have a few participants run out of time to complete their masks. In that event, you'll want to send the participant home with a piece of solar film in an envelope bookmarked with a couple index cards, the take-home care instructions and probably a craft stick.

## Prepare Your Materials Before Your Activity

### *A Few Words About Handling the Solar Filter Material*

Handling the material with bare hands will certainly leave fingerprints. While this will not have a considerable negative impact on the viewing quality, the masks will look less appealing. Cotton gloves are cheap and will do a great service for this material.

- **Update:** After some trials, the children demonstrated that they were considerate and adept at handling the solar material most of the time. We doled out a few extra pairs of cotton gloves on each table and the kids decided for themselves whether to wear them or not. From these experiences, you might want to add more cotton gloves (and in smaller hand sizes), and remember, the gloves are washable between uses.

As it states on the take-home instructions, you may remove fingerprints with a clean, soft microfiber eyeglass cloth. Do not use any liquids, detergents or abrasive cleaners.

### *Cutting the Solar Filter Material*

If you are cutting the 100' solar filter roll on your own, expect this project to take 4-5 hours. A helper will reduce labor time by 10-15%. You will need about 5 linear feet of a clean, dry surface to work with, such as a desk or kitchen counter. Avoid surfaces that have been heavily worked already (i.e. woodshop). You do not want to expose the solar film to an abrasive surface.

Set out your **paper trimmer**, the **index card holder**, fan out a couple hundred **index cards** and insert a long straw into your margarita blender. Don a pair of **cotton gloves**, remove the **solar filter material** from the packaging, and slide the first inch or two of the filter material into the trimmer to make an initial straight cut.

**Begin by making cuts every 5 inches.** Err to the side of smaller, not larger (i.e. better that the cut is at 4 15/16" rather than 5 1/16"). Keep in mind that the final cut will be 3" x 5" which is a *generously* sized solar filter, and undersized filters will store better than oversized ones. After 10 to 20 cuts, set the roll aside and begin your crosscuts.

There is no advantage in stacking or layering the film for your crosscuts. Firstly, the material does not stack neatly or quickly. Secondly, it's even harder to separate after cutting – there's a certain amount of “stiction” between the layers. Finally, and what's most important, if you inadvertently send a double layer into the index card box, the recipient of that filter might not know it either, and they'll end up with a double layered filter. One filter will block 99.99% of the sun's light. Can you guess what two filters will do? You can, however, place two 5-inch cuts side by side on the cutter – which I absolutely do recommend.

So... **with two 5-inch sections of solar film side by side on the cutter, slice these at 3-inch intervals.** Viola! Each 5-inch section you originally cut results in four 3" x 5" viewers – and since you diced up two at a time, then that's eight viewers. Etcetera.

As you generate each 3" x 5" viewer, **place an index card between each** (and at the ends, too). I suggest adding a rubberband around each batch of 100 to help with inventory (typically that's one prepackaged batch of index cards anyhow, so no need to keep count).

### ***Generating the Templates***

A number of mask templates have been provided, royalty free. A few notes:

- As they are royalty free, and seeing as how I am a lousy 'artist', I do not care what you do with them. Modify them as you see fit.
- The provided templates were designed to print as close to the edge of a piece of paper on a typical home inkjet printer with freeware Paint.Net software. You should be able to achieve the same results. However, on copy/scanners, you'll more than likely lose some of the image along the edges. In that event, reduce your original template slightly – 97% of original size, for example, before using a copy machine.
- The original templates included codes that were specific to adult and child sizes. After some experience, it would appear that the Fiskars circular cutting tool will create large enough eye-holes for just about anyone, so you will probably only want to print the templates beginning with “C” (for Child) or AC (Adult or Child) and not print any “A” sizes at all. With a little experience, if you and your volunteers are cutting out the eyes, then a judgment can be made at the moment as to whether or not the eyes should be closer or wider.
- **In most instances, the template eye diameters are considerably smaller than what should be cut out for the final mask product. The template eyes are mostly for guidance and were intended to be customizable. Each eye diameter should be at least 1.33". A diameter of 1.5" to 1.6" is more ideal and up to 1.75" is fine, too.**

### ***Cutting Your Eyes Out Carefully!***

Unless you're trained in Jianzhi or Scherenschnitte, you cannot make a decent pair of eye-hole cuts in 110 lb cardstock with safety scissors (nevermind that a 4th grader proved me wrong again.) It might not help much either for an adult to puncture a 'head start' hole into the mask. This means that the project is reserved for older children that can handle sharper scissors or X-Acto, or that adults need to be involved in some capacity. [An aside, at our museum, parents have been very hands-on with their children on this activity, and many have made masks of their own.] I opted for using special tools ...

Fiskars offers a circular cutting tool (listed in the materials section above) that will make excellent “eyes” out of each mask. It's not a kid's tool. It has a tiny blade in it... that's the scary part. An unsuspecting

adult might not realize that it's a cutting tool and pick it up the wrong way. That being said, it is a very small blade – no one will bleed out or even require a stitch if they mishandle it.

For activity organizers that elect to use this tool (and I do recommend it), you should consider one of two options: (1) if you have practiced enough with the cutting tool, and you feel like you have enough staffing to keep up with demand, you can cut as you go; (2) if you don't have a large staff, you should consider pre-cutting the templates before distributing them to the participants. In the latter instance (pre-cutting before distribution), please know that the Fiskars tool can cut through 5 layers of 110 lb cardstock at a time. Therefore, you can cut out 5 identical templates at a time.

In order to use the Fiskars circular cutting tool, keep the following in mind:

- ★ **The preferred diameter for the eyeholes on the eclipse masks is about 1.5" - 1.6".**  
As previously mentioned, the viewers have a generous amount of leeway, so don't go any less. That being said, 1.5" is on the low end for the Fiskars cutting tool in terms of "coordination". In other words, it takes a little (but only a little) bit of practice to get it right. (**Updated:** Now having trained a number of docents, it takes about two or three tries to learn the 'special technique' for cutting out the eyes with this tool, which is mostly redistributing one's weight as the cutting blade makes it lap around each eye.)
- ★ Use something akin to a wooden kitchen cutting board (or literally, a kitchen cutting board) that is sturdy, very flat, and not prone to slipping/sliding. You will need to tape the mask (or several mask layers) on at least two corners before applying the cutting tool.
  - If the kids are coloring in the masks before the circle cutting tool is applied, it's a good idea to use the cutting tool *before* the rest of the template is cut out (but not compulsory – just a bit easier). The Solar Mask Instructions (file 001) reflect this.
  - You can use a hobbyist cutting mat (like those used by scrapbookers) but I find those are better for precision work and this project demands a bit more 'aggression' with the cutting tools.
- ★ Regardless of how many layers of cardstock you cut at once, you ~~may~~ will want something taped below the bottom layer besides the cutting board itself – a layer of *dense* cardboard, for example (not corrugated cardboard).
- ★ The cutting tool is imperfect – it may not cut evenly on the first pass, and you might have to make multiple passes and **redistribute** your pressure on the tool with each pass. I suggest practicing on a few sheets of cardstock, after which you should get the desired results after just a couple of passes, and maybe a light touch up with an X-Acto knife.
  - Added 9/10/23: After using the Fiskars circular cutting tools on a number of masks that have been colored in with crayon, a fair amount of wax may develop on the bottom of the tool. About once an hour, pop out the blade, then wipe off the flat surface of the cutting tool before reinserting the blade and resuming.
  - Likewise, the cutting tool is good for about 120 cuts (or 60 masks), so that's a good time to clean off the bottom surface of the tool as well. Each tool includes 3 blades, and a pair of replacement blades can be ordered on Amazon for \$7.

### ***Rectangular Eye Viewers***

Some templates lend themselves for rectangular view screens (as opposed to eyeholes). You'll want a straight edge and probably an X-Acto or the like. Typically, eclipse card viewers sold in stores or in bulk have a 1" x 4" viewing slot... you can certainly go "taller" i.e. 1.5" x 4". Creating a sturdy template would be an excellent time saver but I've learned to be rather adept at just using a ruler/straight edge.

## Miscellaneous

The solar filter material might “spill over” the edges of a few of the mask templates after being taped down. It’s perfectly fine to trim off the excess edges, not to mention masking tape spill over as well.

I **discourage** the use of markers for coloring because the ink will cause the paper to curl.

Optional: The provided templates or your own creations can be enhanced with pipe cleaners (whiskers, antennae, etc.), craft “gems” just to jazz things up a bit, stickers, beady eyes, etc. This would be fine for smaller groups; not so much for unpredictable public “masses”.

Three additional files are included in the shared file: \*

- 001 Solar Eclipse Mask Construction (Instructions): This is the simplified version of instructions that are needed only after everything above has been prepared. These are the “public” instructions. **Updated:** We found a number of visitors did not pay enough attention to the instructions and didn’t realize that we would cut out the eyes for them. If we were short-staffed, no one would look over their shoulders to tell them they didn’t need to cut the eyes out with safety scissors. The new instructions emphasize this point. Even so, some visitors *still* missed this point, so get those volunteers out there to keep an eye on things.
- 002 Solar Mask Instructions (Take Home): This is a half page instruction sheet (meant to be cut in two halves) to send home with parents/guardians/visitors.
- 003 Eclipse cautionary stickers Avery Labels 08462: Previously mentioned, this file is intended for self-adhesive warning stickers that can be printed onto Avery mailing labels.
- 004 Mask Late Finish Sign (recently added). We found that a few people would not have time to finish what they started – often to see a planetarium show, etc, so we added a sign at the docent table telling visitors when the activity would end and that they can collect materials to take home and finish their masks (which we provided in an envelope).

If you decide to share this activity, please let me know how it goes. **Thank you** to everyone that shared their feedback and enthusiasm for this project. If you have questions, before or after committing to this activity, please email me at [toomey.mike@gmail.com](mailto:toomey.mike@gmail.com)