

Build a Binocular Eclipse Projector

WARNING: NEVER LOOK AT THE SUN THROUGH ANY OPTICAL DEVICE LIKE BINOCULARS OR A TELESCOPE!
The concentrated light from a lens will instantly and permanently blind you.

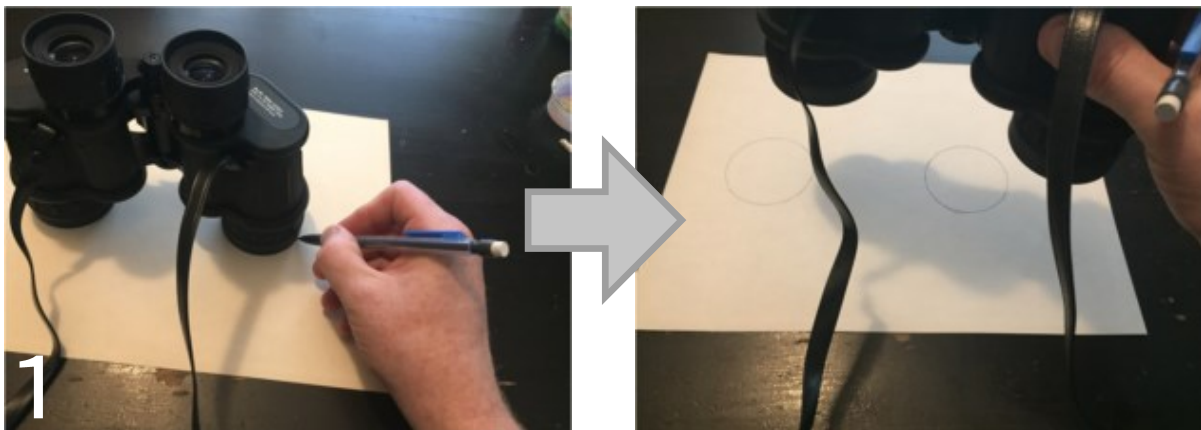
This sun viewer uses an ordinary pair of binoculars - the cheaper the better! - to *project an image* of the sun onto a white screen made of paper. Your eye never looks through the lens, but only at the totally-safe view on the projected image. Any binoculars will work for this, although you probably don't want to use expensive ones, as there will be heat buildup inside the binoculars that can melt some of the glues used to hold multiple elements in place.

Materials required:

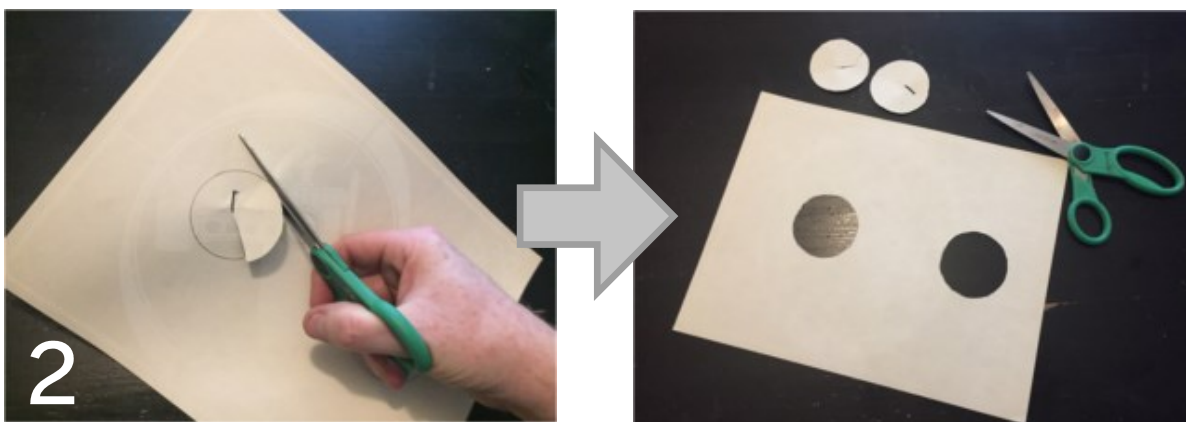
- a piece of cardboard (from a cereal box or thicker) big enough to cover both lenses of the binoculars
- a piece of ordinary white paper or white card stock
- a pair of binoculars with at least one lens cap
- a pencil, scissors, and tape

Instructions

1. Put the binoculars down on the cardboard and trace out the two lenses. If the binoculars don't fit on the piece of paper, try adjusting the binoculars so the two lenses are as close together as possible (usually just by squeezing the two sides together).



2. Cut out the two circles you just made in the cardboard. You now have a piece of cardboard with two holes in it that match the binoculars.



3. Slide the cardboard over the binocular lenses so just the lenses stick through.

4. Put one of the lens caps back on the binoculars, leaving the other lens exposed. (If you don't have lens caps, you can cover the lens in a piece of thick cardboard held with tape or something else that blocks light.) Your binocular sun projector is now ready! See usage instructions below.

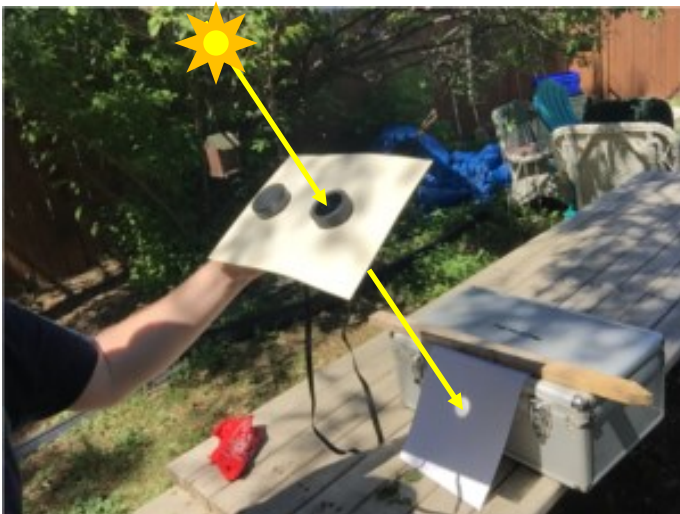


Using your binocular sun projector

Remember, never look through the binoculars at the sun! You should stand with your back facing the sun, and hold the binoculars out in front of you with the exposed lens pointing up and over your shoulder, as shown.

Place a piece of white paper in front of you and move the binoculars around until the light from the sun makes a bright spot on the paper. You'll need to move the binoculars around a bit to find the position that puts the sun on the screen. If the image of the sun is oval-shaped, tilt the screen so it is parallel to the cardboard shield on the binoculars.

Once you have a bright spot on the screen, adjust the binoculars' focuser until the edge of the spot becomes sharp and well-defined. You are now looking at a safe projected image of the sun on the screen in front of you!



IMPORTANT: Don't keep your binocular solar projector pointed at the sun continuously for too long - the sun's light will heat up the binoculars and can melt the cement or any plastic parts. Keep the sun's image on the screen for a couple of minutes at most before you turn it away from the sun and let it cool down for a minute or two. And remember, **DO NOT LOOK THROUGH THE BINOCULARS**, and make sure no one else can get between the binoculars and the viewing screen.