

## Quality Magnification for Outreach

Entomology is plagued by scale. When working with kids I constantly tell them to look at small things (and they are willing!), but until now I haven't had a quality magnification device that was cheap enough I could let the kid keep.

For ~\$2 each, a glass LED flashlight lens surrounded by a double wire spring clamp makes a hearty magnification device complete with a loop for string attachment. Let the kids pick the color string and tie it themselves.



The lens is borosilicate glass used for low-watt LEDs, like flashlights. They are available for about a dollar each on eBay.com. I've carried one in my pocket for about a month now, along with change, keys, metal stuff I pick up off the ground, etc. and it hasn't scratched or scuffed.

I've found three ways to encase the lens so a string can be tied to it.

The best is a double wire spring clamp. Pros: the lens will not fall out; good loop for string attachment. Cons: an adult will have to use pliers to squeeze the clamp open and insert the lens; not available in stores, there is only one place I know to order these online.

A double wire screw clamp will also work. Pros: the kids might be able to screw the clamp shut around the lens (they get to use a tool and make something). Cons: the lens isn't held ridged and there is no easy place to loop a string; not available in stores, there is only one place I know to order these online.

A nylon spring clamp will work. Pros: can be purchased in stores; the kids can assemble this themselves. Cons: the lens is likely to fall out with use; a hole will have to be enlarged in the handle to accommodate the string; more expensive and less durable than the others.

### ITEMS

**Lens:** eBay; ~\$1.10 each; 30mm LED Convex Lens Optical Glass Lens FOR 1-5W LED; free shipping.

**Metal Clamps:** <https://www.hcl-clamping.com/>

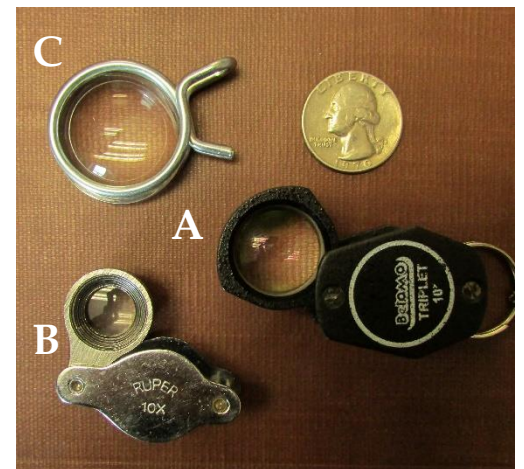
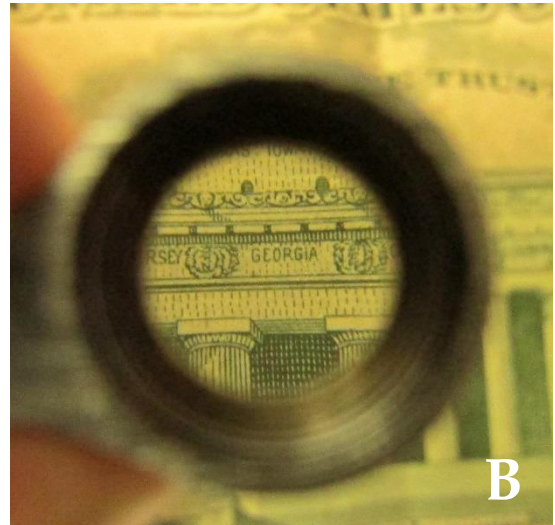
**Wire Spring:** DW-28.7, Double Wire Spring - Zinc Plate, 1.09"-1.16"; \$0.54 each

**Wire Screw:** 121 Double Wire Screw - Zinc Plate; \$0.86 each

BUT shipping cost ~ 50¢ per item.

**Spring Clamp:** 3/4 inch spring clamp (Wilmarcorp.com #W5088) purchased off the rack at Tractor Supply (I found a different brand at ACE Hardware). These cost about \$1 each. There are probably lots of manufacturers of this style of clamp.

## Comparison



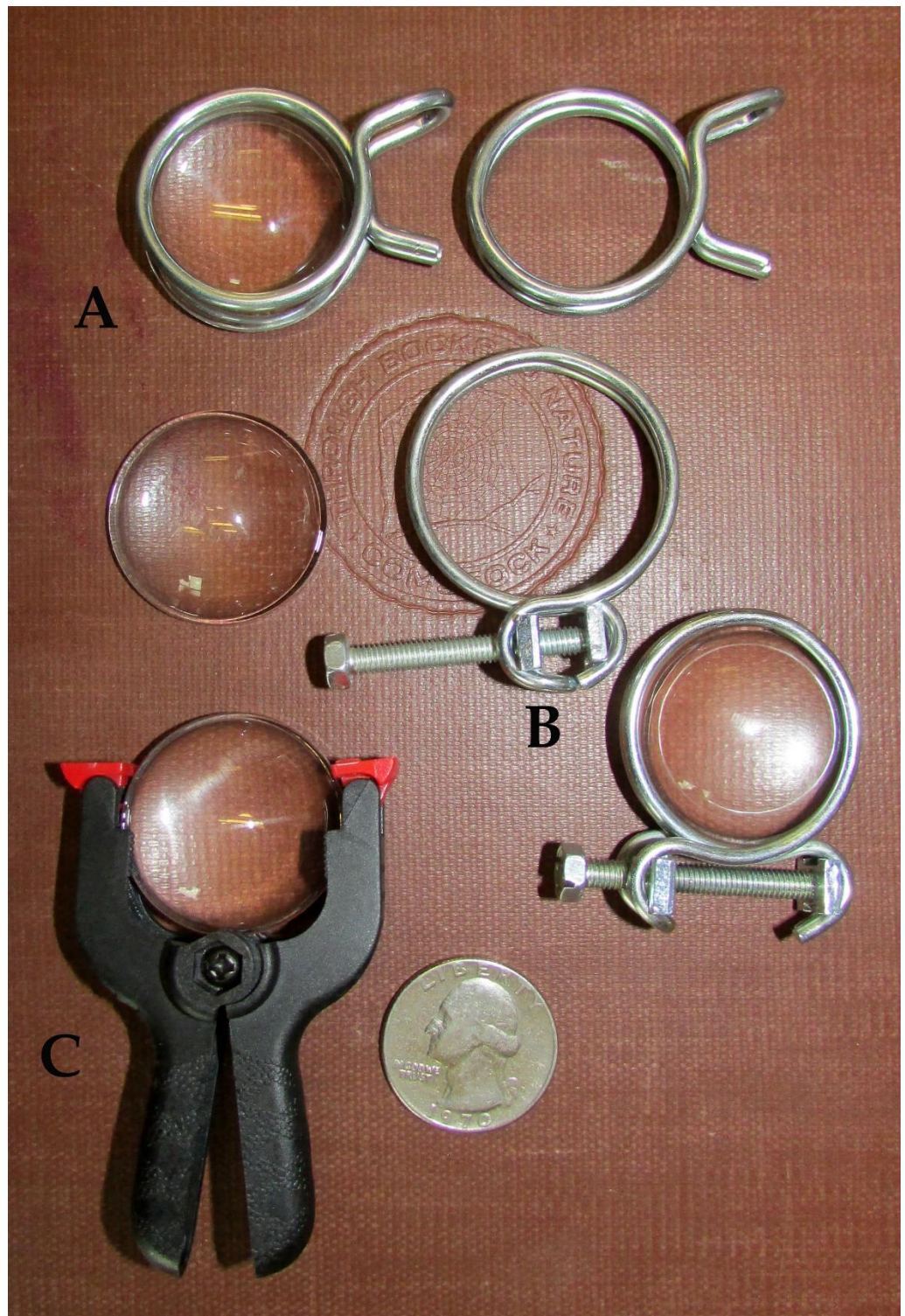
- A. Belomo Triplet 10x: \$30
- B. Ruper 10x: \$6-\$30 depending on brand
- C. LED Lens: ~\$2

Comparison of magnification and distortion using the microprinting on the back of a \$5 bill. Clearly there is less distortion from a triplet loupe, but the LED lens provides a similar amount of magnification and a much wider viewing range.

A: Double wire spring clamp with and without a lens

B. Double wire screw clamp with and without a lens

C. 3/4 inch spring clamp with lens.



Please send comments, questions, improvements, etc. to:  
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