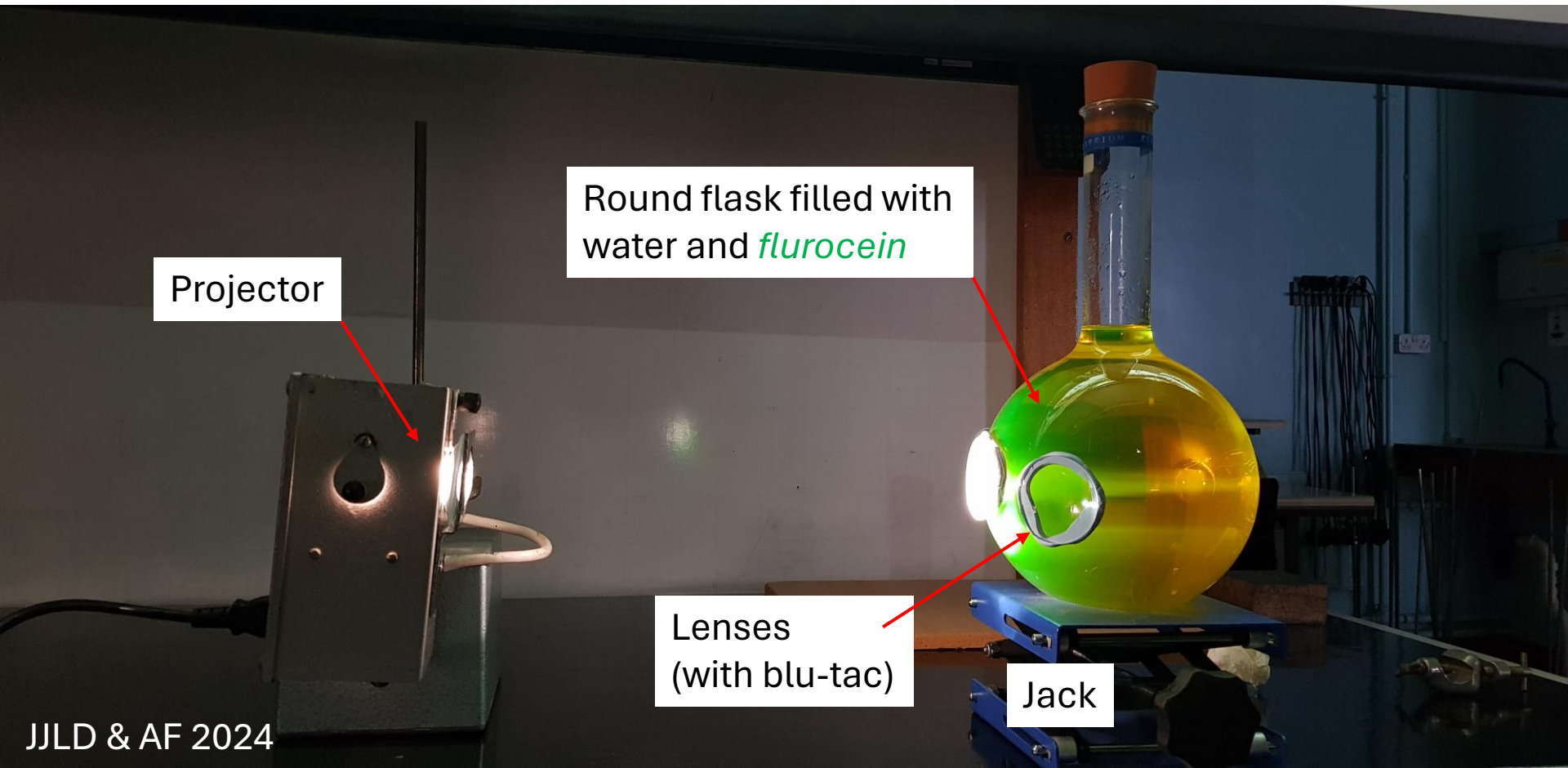
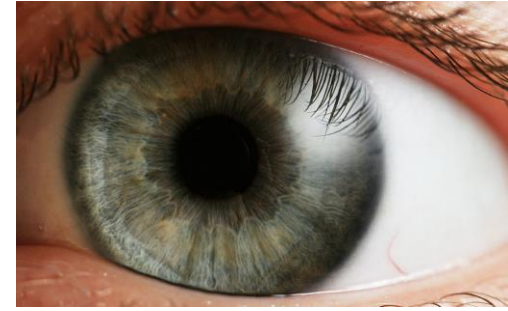


# Long and short sight (and corrective lenses) demonstration

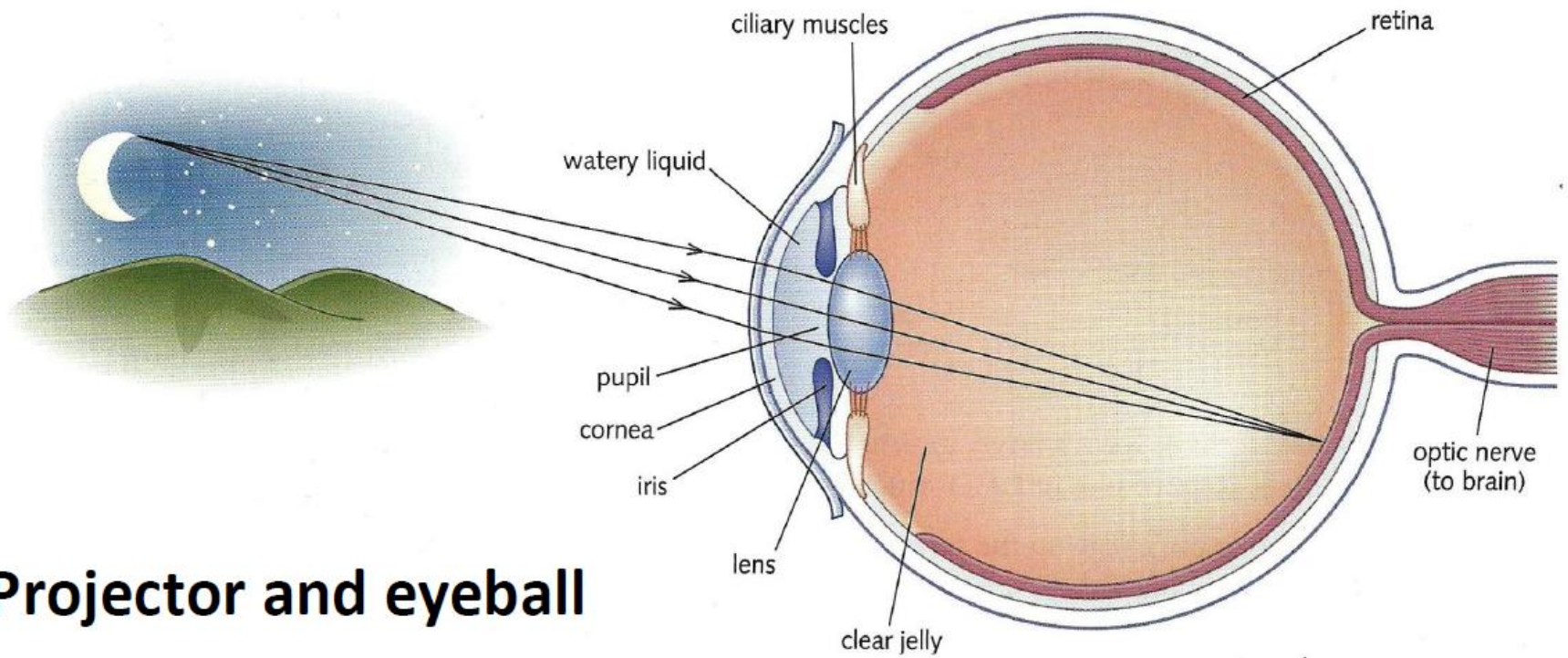
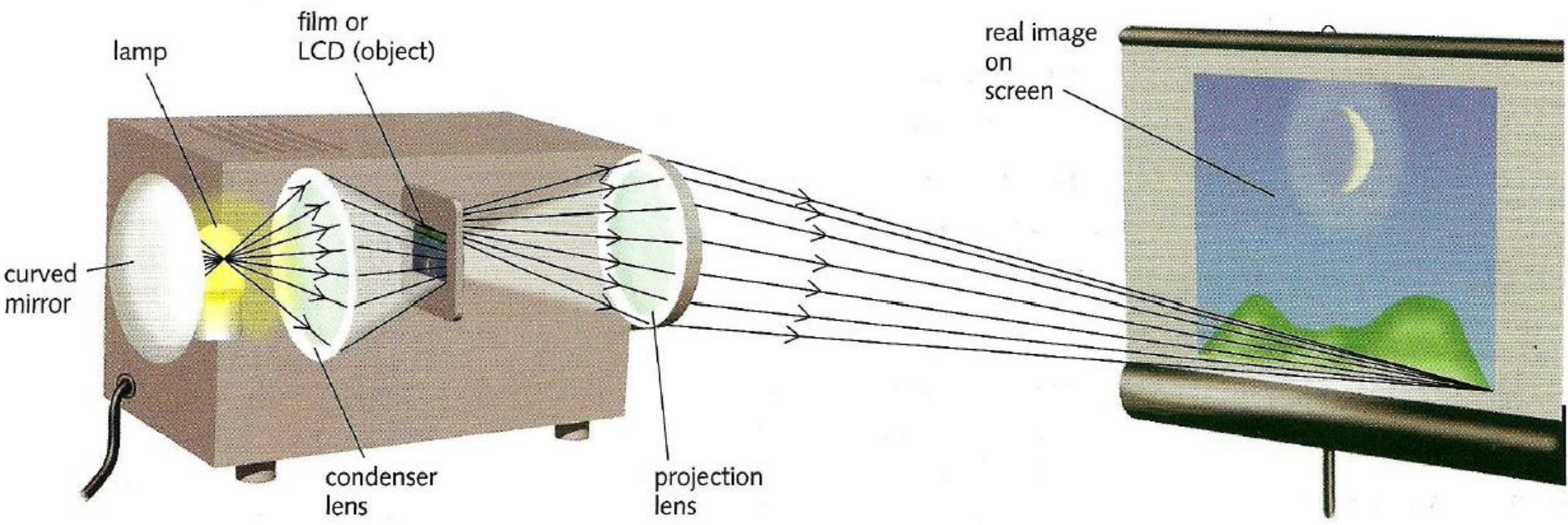


Projector

Round flask filled with  
water and *flurocein*

Lenses  
(with blu-tac)

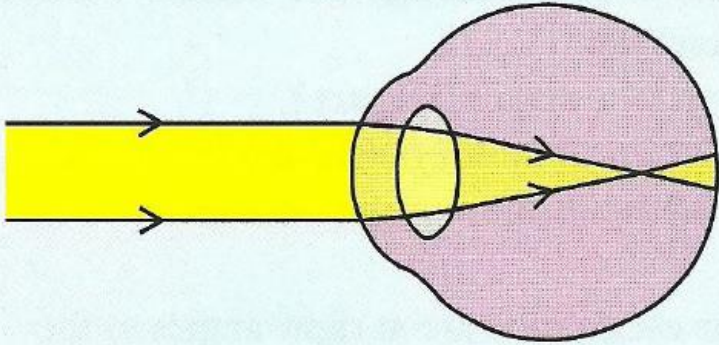
Jack



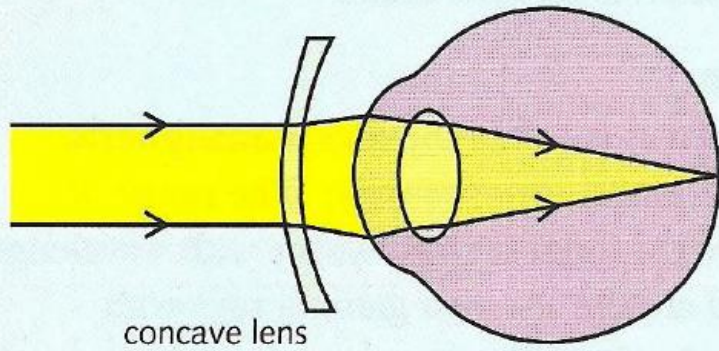
**Projector and eyeball**



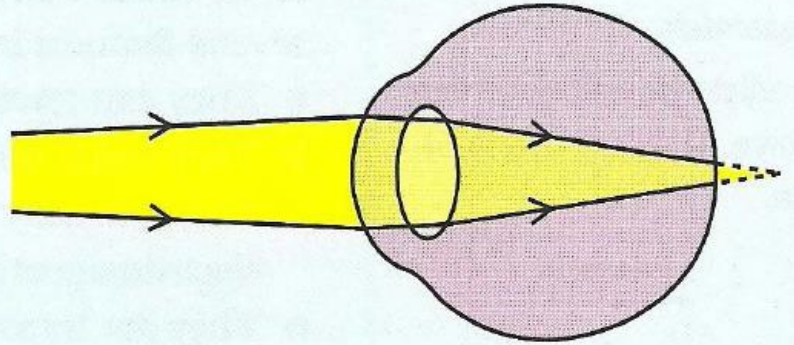
Short sight



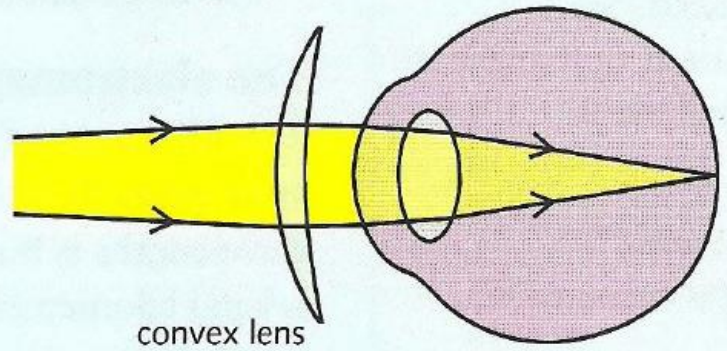
Correcting short sight



Long sight

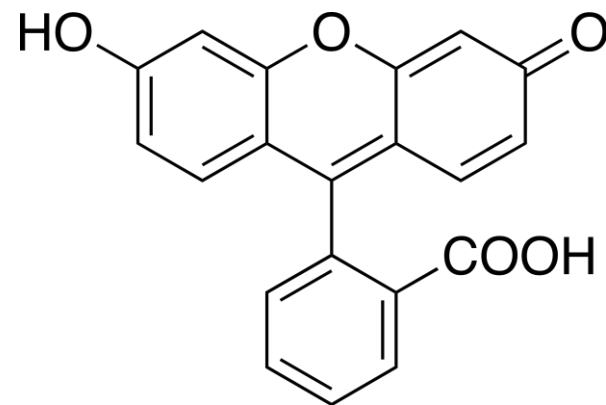


Correcting long sight

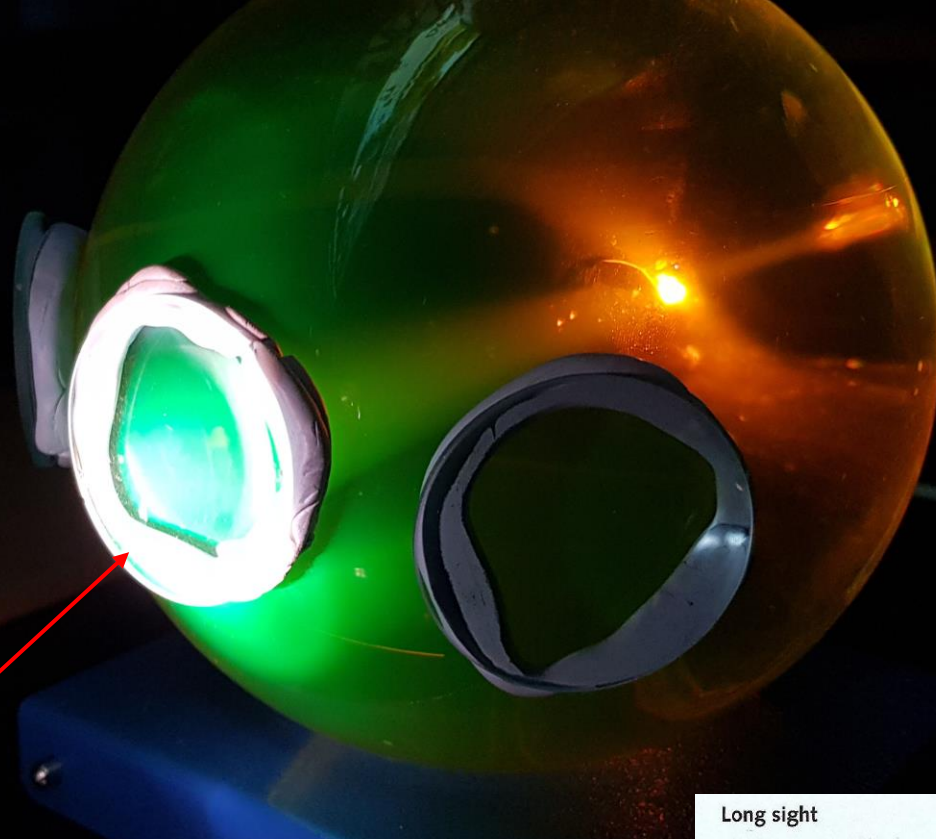


**Fluorescein** is an organic compound and dye based on the xanthene tricyclic structural motif, formally belonging to triarylmethine dyes family. It is available as a dark orange/red powder slightly soluble in water and alcohol. It is widely used as a fluorescent tracer for many applications.

The color of its aqueous solutions is green by reflection and orange by transmission (its spectral properties are dependent on pH of the solution), as can be noticed in bubble levels, for example, in which fluorescein is added as a colorant to the alcohol filling the tube in order to increase the visibility of the air bubble contained within. More concentrated solutions of fluorescein can even appear red (because under these conditions nearly all incident emission is re-absorbed by the solution).





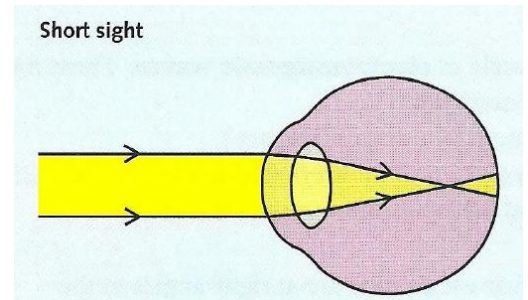
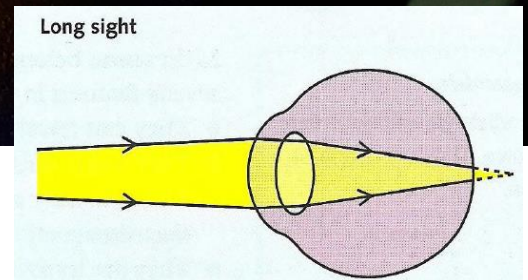


Stick on the lenses.

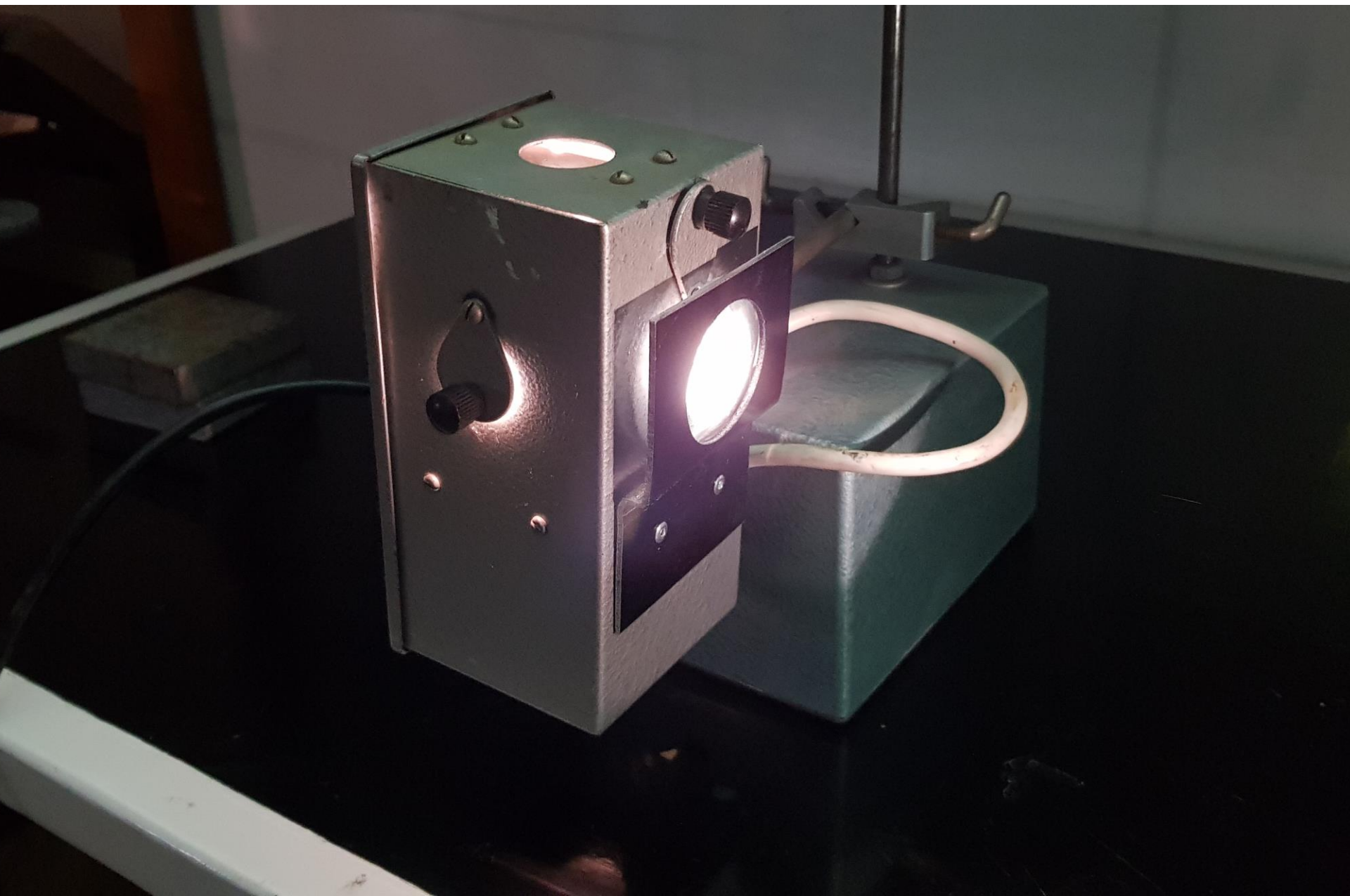
One will result in a converging light beam at the back of the sphere (representing perfect vision).

One will not be sufficient to focus the light (representing **long sight**).

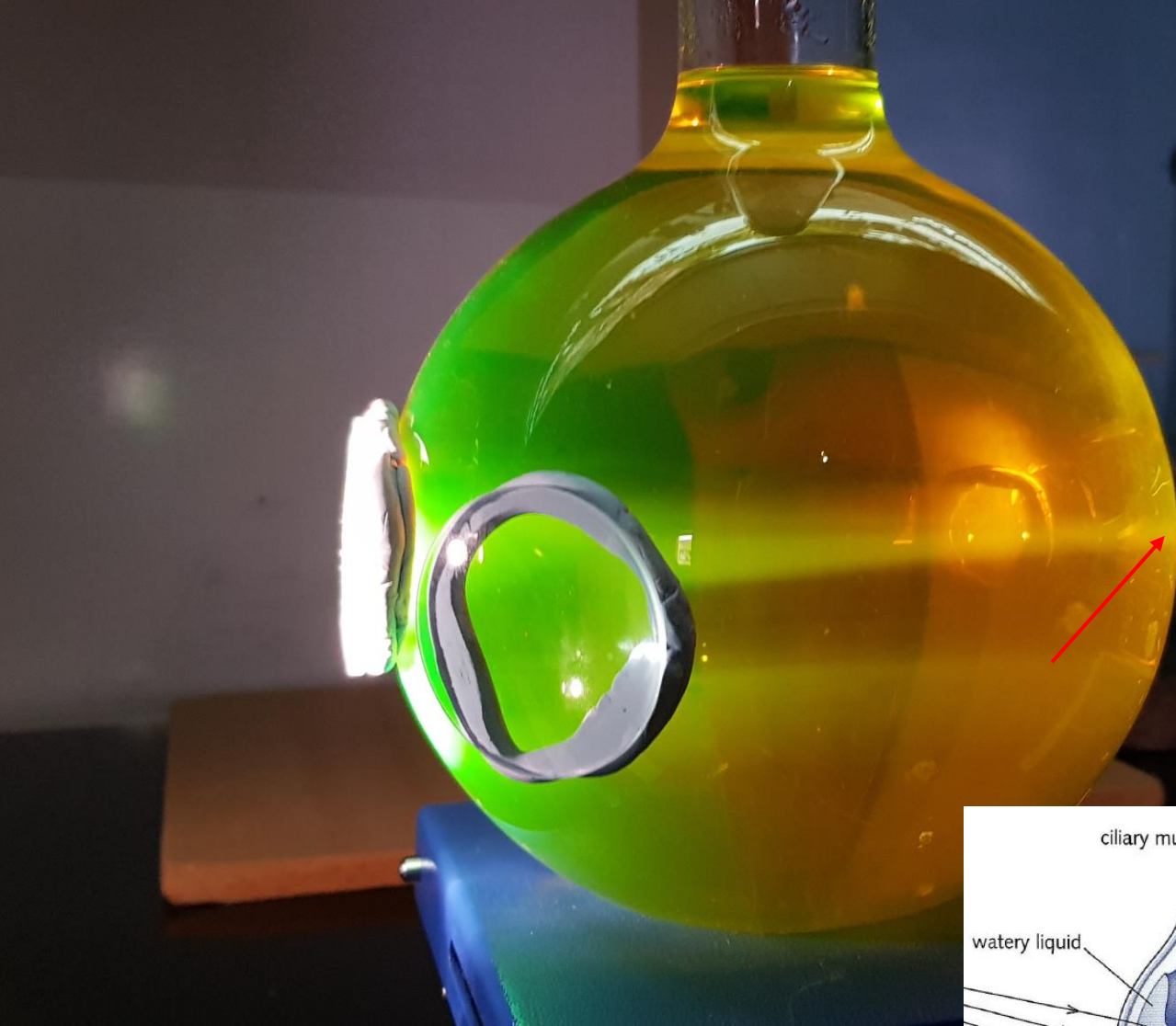
One will focus the light *before* the back of the sphere (representing **short sight**).



Projector (producing a *collimated* beam of white light)

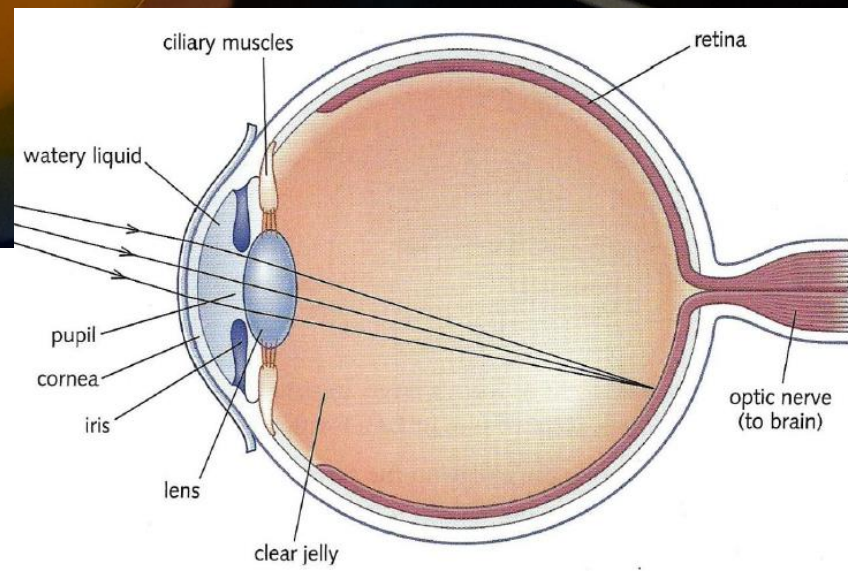


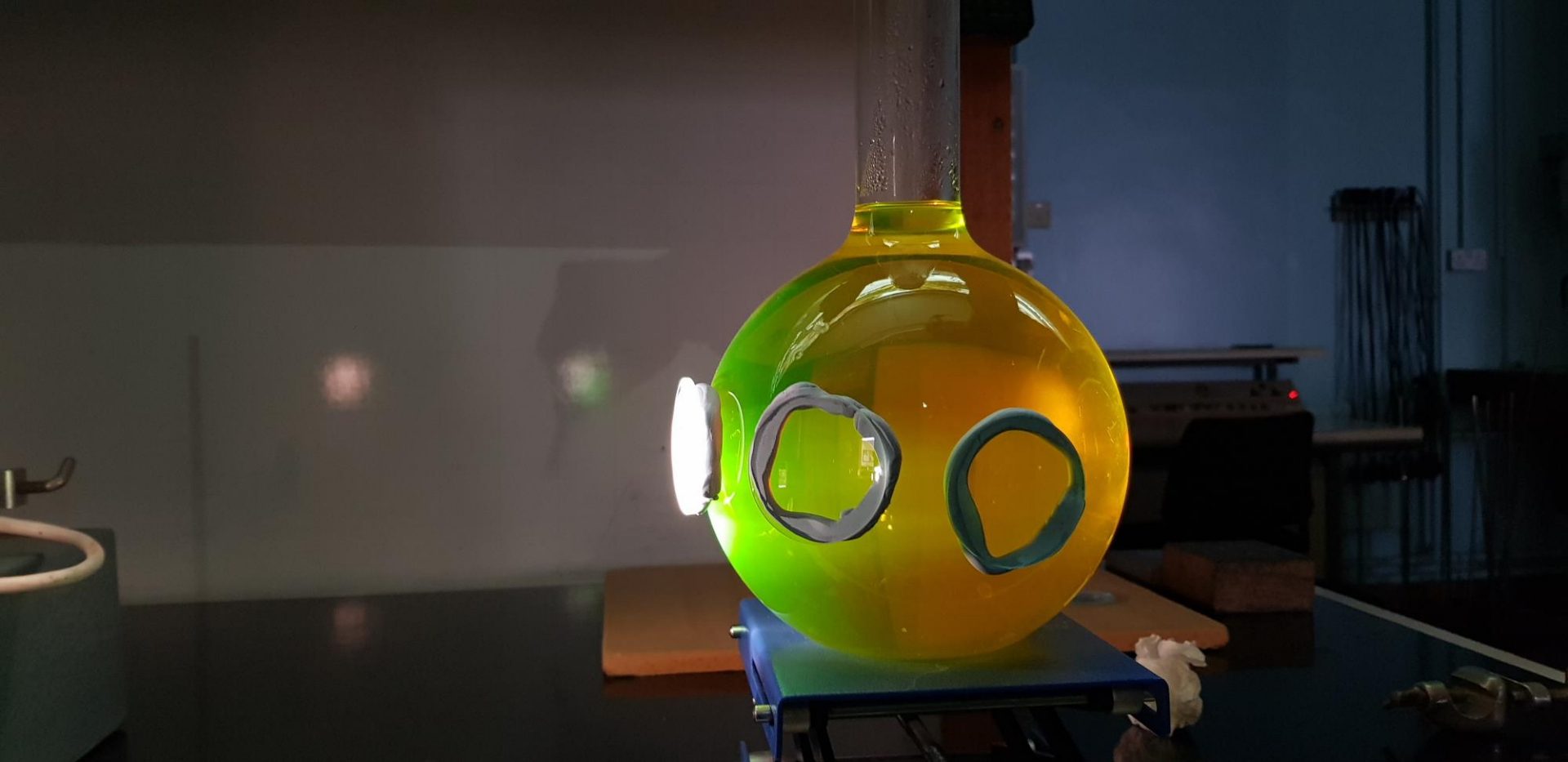




Light rays converge here.

Light beam converges on back of sphere, *representing perfect vision*. The back of the sphere is a model of the **retina** of the eye.

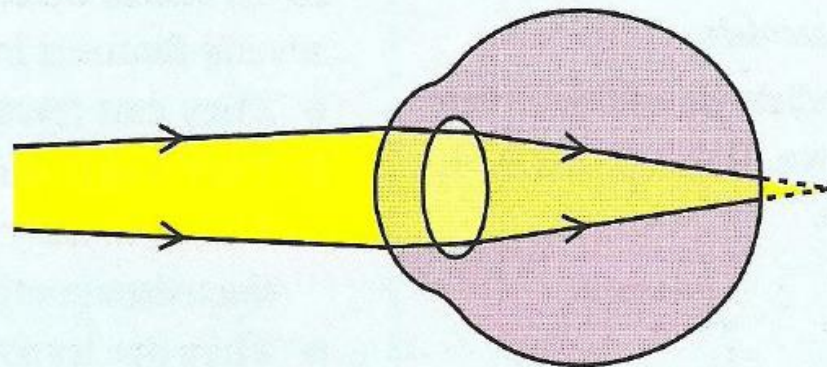




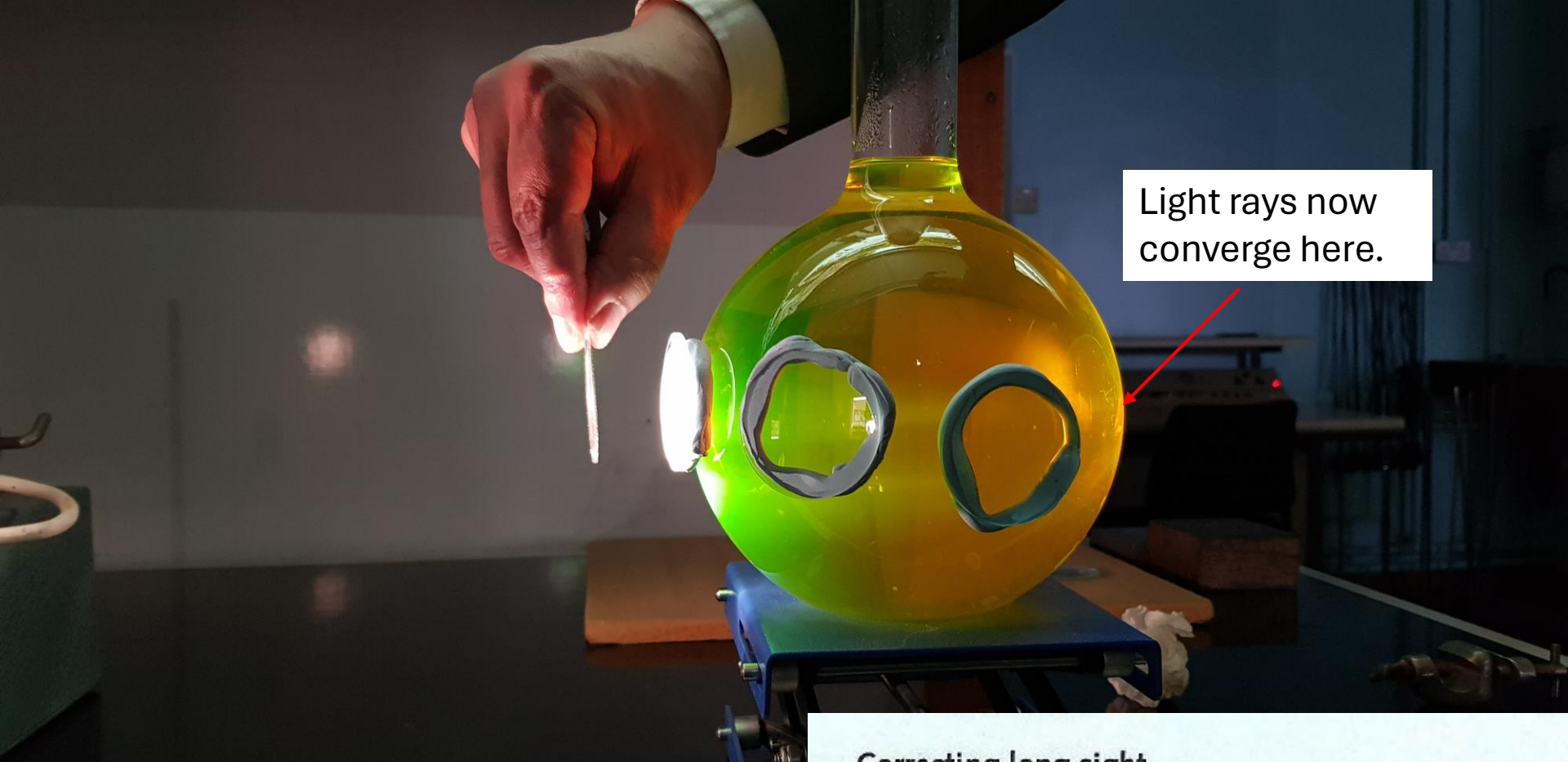
Rotate sphere such that the (new) lens has a longer focal length. This simulates **long sight**.

(i.e. *too small eyeball, or insufficiently powerful lens*).

Long sight

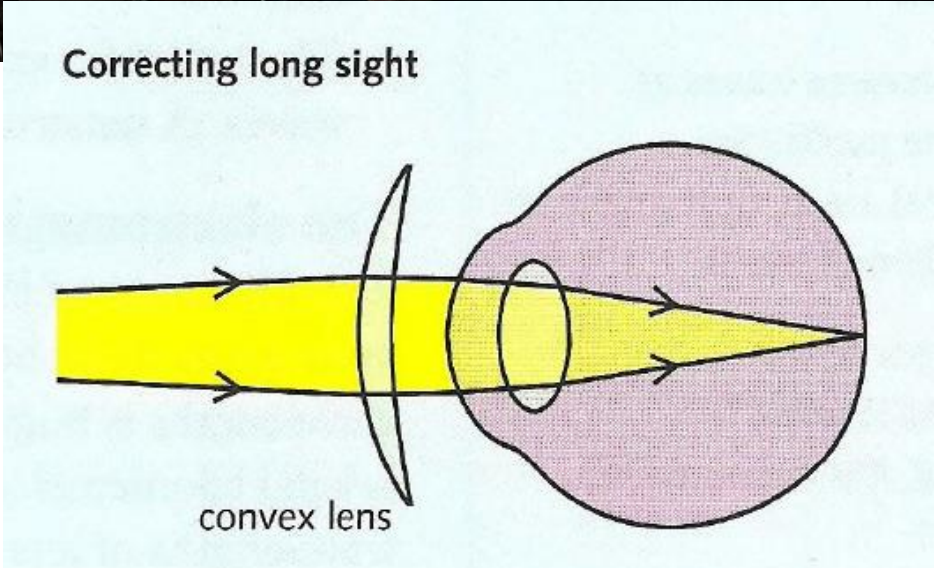


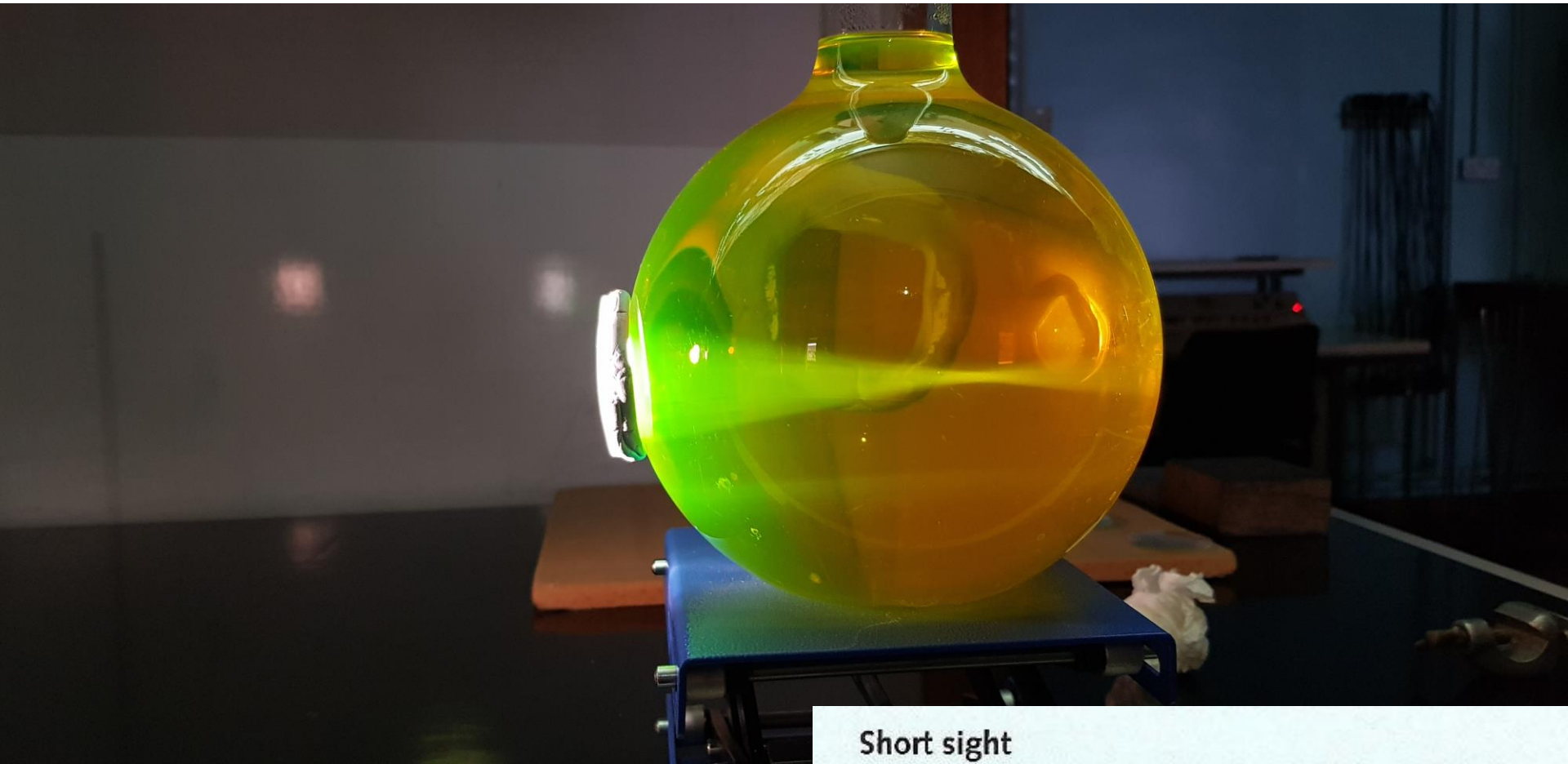




Light rays now converge here.

Correct **long sight** with a *convex* lens (i.e. a pair of glasses or contact lens for a real eye).

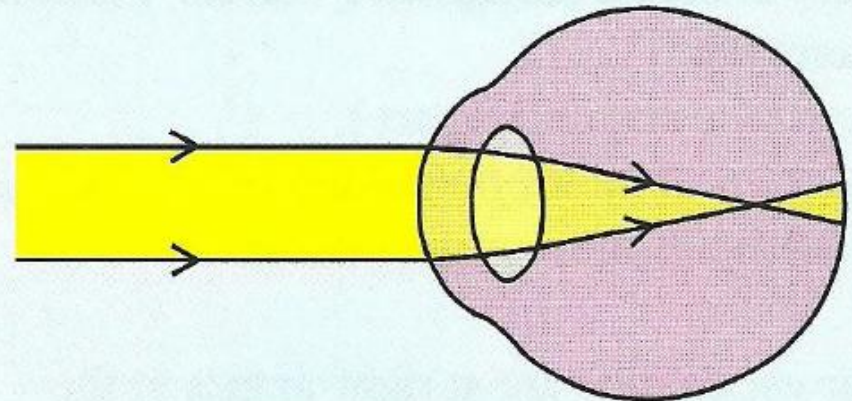




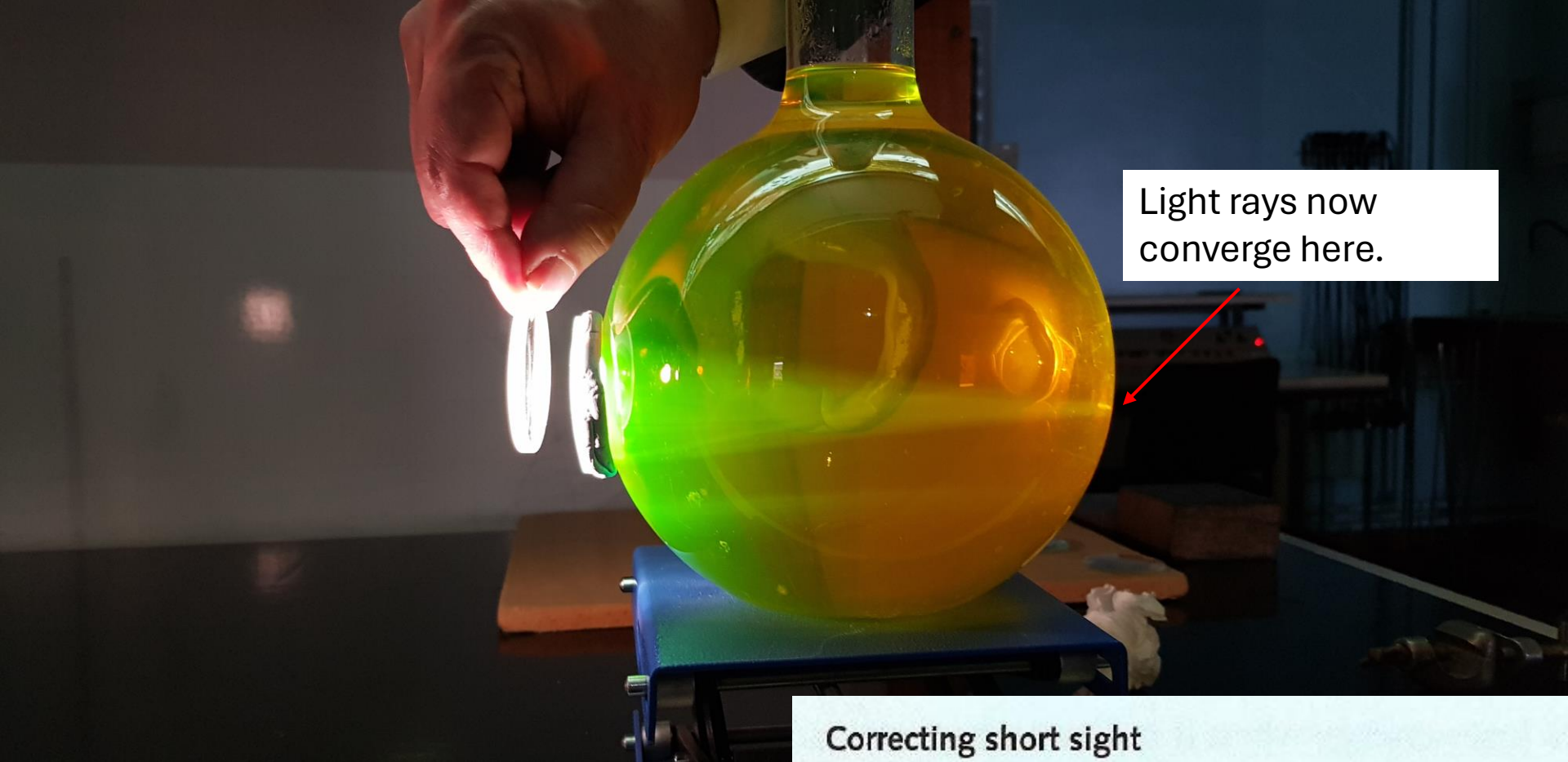
Rotate sphere such that the new lens has a smaller focal length. This simulates **short sight**.

(i.e. too large eyeball, or too powerful lens).

Short sight







Light rays now converge here.

Correct **short sight** with a *concave* lens (i.e. a pair of glasses or contact lens for a real eye).

