

Modeling the Eye (Part 1)

Scientists use real objects & models to understand and investigate things.

Let's make a model of the eyeball using a cardboard box.

Eyeball = Box

First we have the Eyeball – that is represented by a cardboard box – but we'll leave one side open so that we can see what is inside it.

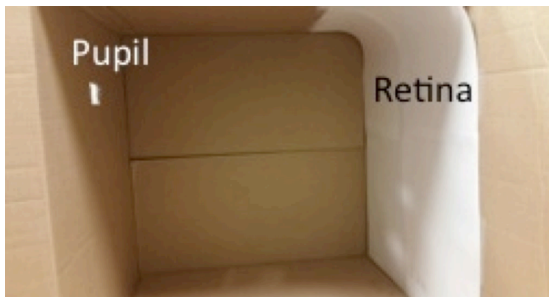
Retina = Screen

Next we have the Retina – that is the back of the eyeball or the screen upon which the image lands. It is also where the eye collects information (via nerves) to help us see the image.

Pupil = Hole

Finally we have the Pupil – that is a hole on one side of the eyeball – we're going to put ours a bit on the high side – about $\frac{3}{4}$ the way up the box.

This is a rough model – what are we missing?



Retina (screen)

Do you see anything on the Retina (screen)?

Perhaps there is too much light...let's close up the remaining side....
Can you see anything peeking in through the pupil?

Modeling the Eye (Part 2)

Really we want to see what appears on the retina when the eyeball is closed up...but we can't easily do that without putting in extra light. SO... we are going to cut a hole in the box for the head to go into.... The hole should be the size of your head!



Then we will add a garbage bag with the closed end cut off so that it forms a tube that we can put our neck through. We tape the garbage bag to the hole so that it will help keep light out from where we stick our head in. Then maybe we can see what appears on the retina.



Still can't see a good image on the retina? The maybe we have to have a smaller pupil.... Tape a piece of aluminum foil on the outside of the box over the pupil. We will then start by putting a small hole in the pupil, then a progressively larger hole....

And before we do that, lets make sure our box doesn't let in any extra light, since our eyeball doesn't let in any extra light (except through the pupil).



This worksheet was specifically created for IMPACT. For a nice general look at the Pinhole Theater take a look at the Exploratorium's write-up:

http://www.exo.net/~emuller/activities/personal_pinhole.pdf