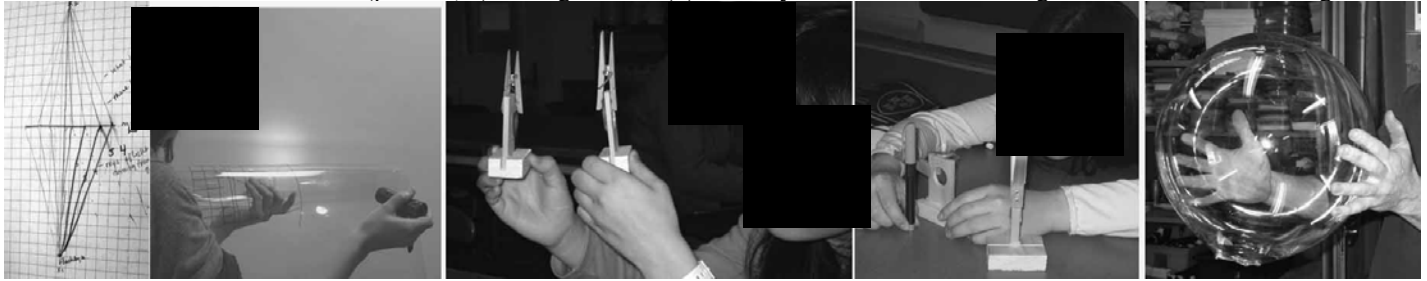


Class Summary, January 11, 2010, SP 713

Looking with materials

A diagram (photo 1) where the horizontal line is a mirror; a light is placed at bottom vertex at different angles toward mirror; lines show its path. A plastic sheet (photo 2) is bent while a light is directed at it to see what light does at the curve. Looking through two lenses in succession or alone (photo 3, 4). The glass ball (5) made by Peter Houk for housing a camera in a hazardous gas.



Visit to MIT Glass lab

Peter Houk lays out glass canes having a white core (1). An artist torches heat onto a glass lamp (2). Peter and Whitney work in two furnaces at once (3), coordinating the preparation of the plate of canes (4) and the glass glob that picks them up (5). Rolling the composite glob and its cane sides (6); blowpiping (7); the vessel immersed briefly in water (8); tools (9); the shaped vessel (10); its transfer to a second punti rod (11); its release from the first rod and the emergence of a lip (12); Starting the inner vessel (13); rolling, forming, shaping (14-17); placing the inner vessel within the outer (18); working the combined two layer glass form (19,20).



Figure by MIT OpenCourseWare.

Tools for shaping the outer surface (21-24); the glass is placed in glass oven, excess poured off (25), reshaped (26) and blown (27).

Lenses and Observing

The border around an eyeglass lens is a kind of frame. Considering the analogy between the frame of the picture – what we observed there – and the lens as a view frame – how these cases relate; “can I reuse the diagrams?”

Two lenses with a mirror behind; a person’s image appears smaller (photo 1,2).

Looking with one or two lenses being held in: the hands (3), a tube mounting (4), on mounts on a table (5, 10).



Recording relative positions and the appearance of a small block at each different position.

With the convex lens alone: “I keep [moving it back] it comes to clear focus getting larger. I move the lens out of the way, compare [no lens with lens view].. an incredibly close view I can read a lego symbol.. reversed vertically and horizontally”

With concave lens alone: “it looks very far away .. everything is right side up. .. getting bigger slowly .. not even the same size as the actual object.. this seems to make it smaller.

-“now try two convex lenses to see if they right each other and then a convex and a concave”



A method for comparing two lenses, one rounder than the other: holding them at the same position from an object, and then moving them toward the viewer while watching (6, 7).

“At what point does it[one lens] flip [the image]? Is it the same point as that [other lens]?” “Good question”

Both lenses held “at the same starting point.. [With one] This is bigger and this makes it blurrier and then already the image is flipped over on this side and this [other] one is still magnifying. So this is flipped over already and this is not. ...on the margin [of the lens] ... I can see nothing here” Do concave lenses work the same?

What about a lens that is concave on one side and convex on the other?

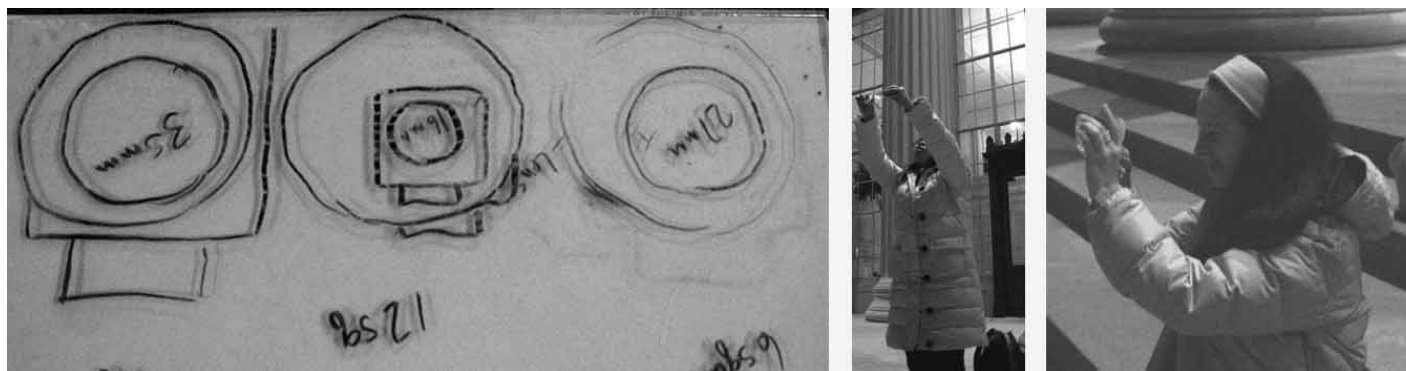
-“ a concave lens .. what is it good? for a sense of perspective? where I really am take everything?”

-“What would a concave lens on its own be good for?”

A convex lens shows the numbers a little larger when near to the sign (8), and has the letters upsidedown when it is further (9).

Drawing onto a plastic sheet (11, 12) the apparent view with lenses.

Looking outside with lenses (13, 14). The lens is a magnifier for close up.



MIT OpenCourseWare
<http://ocw.mit.edu>

EC.050 Recreate Experiments from History: Inform the Future from the Past: Galileo
January IAP 2010

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.