Lens based camera obscuras

Although camera obscuras can be made with a hole, lens based obscuras give a bright enough image to be used indoors.
The obscuras are designed around the focal length of the lens (the distance the lens focusses at infinity) and the lenses required can be very cheap.

There are two lens based obscuras I use in the classroom. The 'hand held cereal box' (Actual Reality Obscura) and the room obscura.

Hand held obscura ('Actual Reality' Obscura)

Worksheet and video here

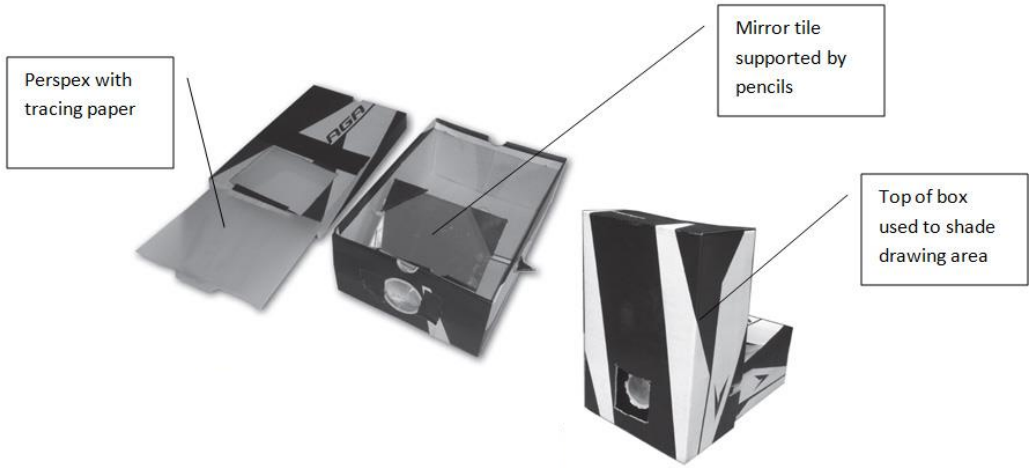
The Hand held cereal box obscura can be made for virtually nothing and shows how a lens focusses an image. With sufficient resources and preparation every student can make their own and take it home. One drawback, apart from having to find a lens for each student, is the need to store 60 cereal boxes in your shed! (Get them to bring two boxes in during the previous week).

Many glass magnifying lenses work well however they can be a bit pricey. Cheap plastic 'fresnel' wallet magnifiers are fairly good quality, can be bought for around 30p each and reused. 'Fresnel lenses' also give you the chance of going on and on about lighthouses (look it up). If they don't focus close enough, you can use one lens in front of the other.

A selection of other lens based obscura designs can be found here many of which make use of the various cheap lenses obtained from dismantling budget reading glasses.

Drawing obscura

A bit more complex but a good art project constructed from a shoe box and a small mirror.



The Room Obscura

Something every science, art class needs to create. Once you have a dark space you can experiment with light, not only with a lens but also with holes etc.

You will need:

- Blackout material (silver foil) See instructions here:
- A cheap (Tescos) shower curtain
- A +1 diopter lens.

Full instructions here

Plan View of lens room obscura set up.