Experimenting during an eclipse

2400 years ago Aristotle viewed an eclipse through a small hole, now it's your turn!

Preparations.

The suns brightness enables you to project its image through a hole rather than using a lens. Holes, as well as being cheaper and safer, don't require focussing, so making it easy to create hand held devices as well as opening up creative experimentation with everyday objects which have multiple holes. Always making and test devices in advance, ideally with a non-eclipsed sun, so you are sure it works!

All viewing devices need to be designed to prevent the operator looking at the sun. Instead, a projection of the sun is viewed on a shaded white surface.

Multiple holes will create multiple images. See this short video on how to find a school of dolphins in a cream cracker!

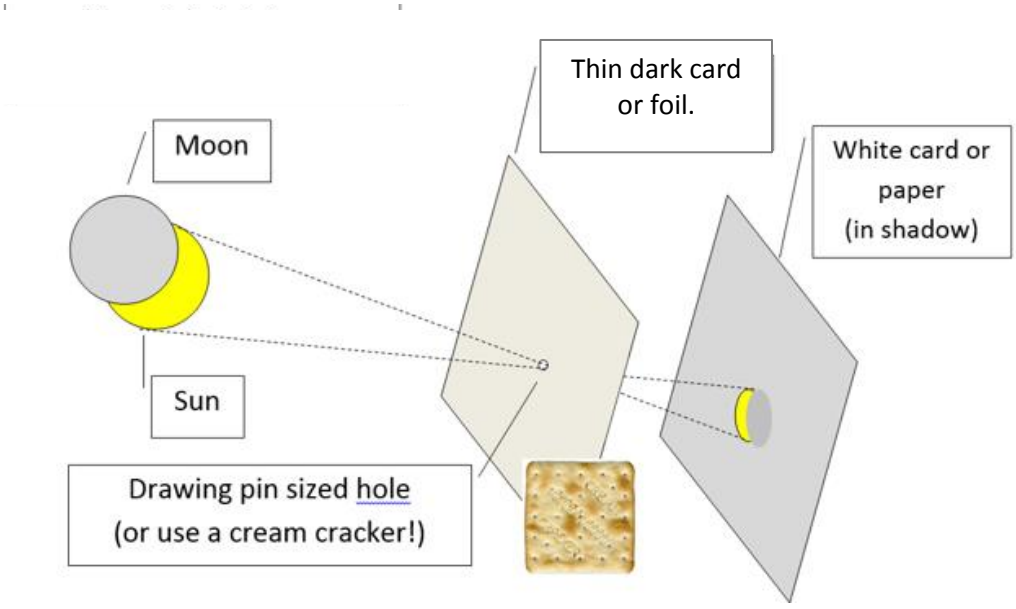
Binocular Projection

Not the most imaginative approach but a simple safe way to project the suns image. You will need:

- A pair of binoculars. Any will do.
- A tripod or a clamp to tape the binoculars to so it can be moved as the sun moves across the sky. (Even though it's actually the earth moving!)
- Two pieces of white card. One to create a shadow around the binoculars, the other to project the image upon.
- Some tape to cover up one of the lenses of the binoculars.

The pinhole viewer

The theory behind the pinhole viewer



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Making the Viewer

The best thing to make viewers out of is 'anything you happen to have' such as kitchen roll tubes and cereal boxes! A safe and simple design using a cereal box is here courtesy of the University of Central Florida.

You will need:

- A pin
- A cereal box
- A sheet of paper
- Some sticky tape
- Some silver foil.
- A tube (optional)

Here is an image of a similar viewer which incorporates a tube. The longer the tube the greater the 'magnification' of the projected image on the bottom of the box although it will become dimmer with the increased distance.

If you are simply holding a cracker or hole in front of a 'viewing sheet' (A4 paper) the sheet will need to be in the shade such as projecting the sun onto the shaded side of a building.

Making the pinhole.

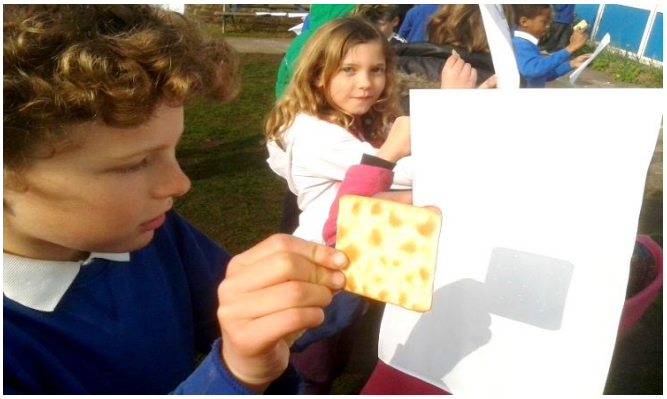
Don't worry about it! Any pin will work, just make a hole in a small piece of card or silver foil. (Time to open the jam tarts!) This is taped over the top end of the tube or Cereal box.

Further hole based eclipse experiments

Cream cracker

Multiple holes in a cream cracker will result in multiple images of the eclipse!

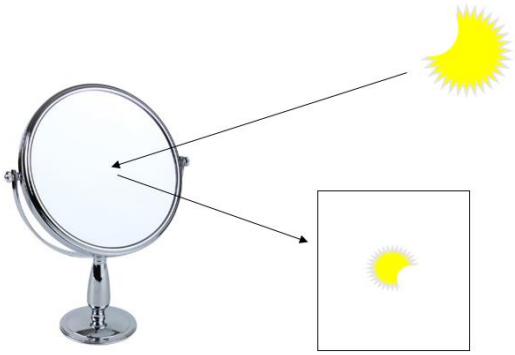
Replace the pinhole on your cereal box pinhole viewer with a cracker to create multiple eclipses. Be aware, more expensive cream crackers don't have clear holes where as the cheaper crackers usually do! It's best to check before holding the cracker in position!



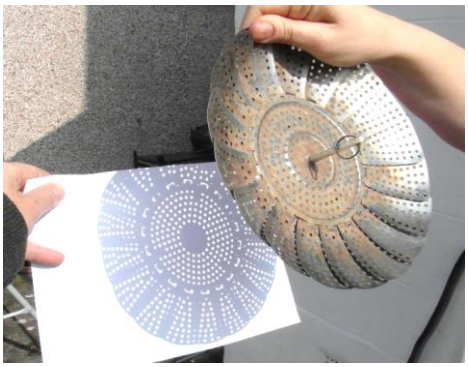
Images from Glenfrome Primary School in Bristol during a partial eclipse on the 20th March 2015. (Where did all those crackers go?)

Concave Mirror

Use a concave 'shaving mirror' to project the eclipse onto your ceiling. These 'magnifying mirrors' work in a similar way to a 'Newtonian telescope' and magnify a distant image, projecting it onto a close surface. This was possibly one of the earliest ways that artists like Vermeer replicated perspective. May work best with someone else holding a sheet of paper or card so they can move closer until the image is in focus.



Kitchen utensils



Find some kitchen devices with holes in such as colanders, cheese graters, and see if these can create multiple images.

Trees

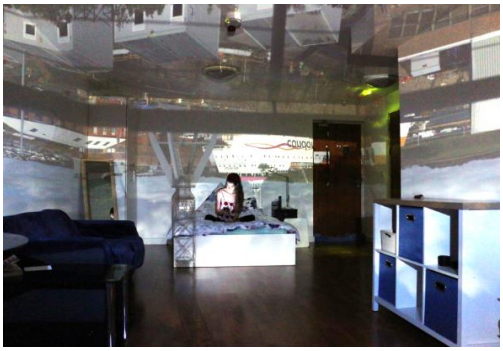
With more pronounced eclipses during the spring and summer you can see crescent suns projected onto the ground through the gaps of leaves in a tree

Hands

Crossing your hands over can create small holes which can also project eclipses.

Creating an indoor room obscura.

See the 'Room Obscuras' page here and further ideas here. Image by Beth Walsh @tinybeth



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