Pinhole photography
## (Fotografía estenopeica)

A **pinhole camera** is a simple camera without a lens and with a single small aperture – effectively a light-proof box with a small hole in one side. The process is based on the Camera Obscura, so light from a scene passes through this single point and projects an **inverted image** on the opposite side of the box. The human eye in bright light acts similarly as do cameras using small apertures.

Up to a certain point, the smaller the hole, the sharper the image, but the dimmer the projected image. Optimally, the size of the aperture should be 1/100 or less of the distance between it and the projected image.
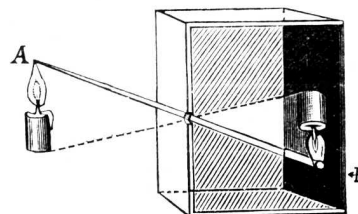
Because a pinhole camera requires a lengthy exposure, its shutter may be manually operated, as with a flap made of light-proof material to cover and uncover the pinhole. Typical exposures range from 5 seconds to several hours.

A common use of the pinhole camera is to capture the movement of the sun over a long period of time. This type of photography is called **Solargraphy.**

The image may be projected onto a translucent screen for real-time viewing

(Source: Wikipedia: http://en.wikipedia.org/wiki/Pinhole_camera)

Although some brands as Ilford still offer nice pinhole cameras (around €300), it's easy to make one with some stuff avaliable in every home (shoe box, aluminium foil, black paint and rubber bands) just for €0.

Vocabulary			
Pinhole camera	Cámara estenopeica	shutter	obturador
lens	lente		
Light-proof (adj)	A prueba de luz		
dim	oscuro		

Activity: taking photos with my shoe box!

The activity is organized in three steps:

1- Building a camera (classroom)

2- Taking a photo (playground)

3- Developing the photo (photo lab)

1- Building a camera:

- Each student must get a shoe box and paint it inside with black paint so that it can't reflect any light.

- Open a small hole (about 1,5x1,5 cm) at the front.

- Cover the hole with a aluminium foil (or a light-proof similar material) . The piece of foil should be stuck to the hole edges.

- Punch the foil at the centre with a pin to get a tiny hole.

- Make sure that light can't go into the box through joints...

- Install an appropriate shutter which can be removed to allow light pass through the tiny hole.

2- Taking a photograph.

- Look for a good subject and place the camera so the "eye" can see it. Remove the shutter and wait from 5 seconds to several minutes (it will depend on the light conditions).

- Close the shutter and go to the darkroom.

3- Developing the photo (negative).

- Once inside the darkroom, with lights off (only red light can be on), take out the paper.

- Four trays must be prepared and sorted out: 1/ developer 2/ stop developing 3/ fixer 4/ cleaner (water)
  Put the paper into the first tray (40 seconds to 3 minutes); then put it into the second tray (water) for 1 minute; coming up, the third tray with the fixer for 7- 12 minutes and finally the last tray (around 15 minutes in running water)

- Hang the photo to dry it

4- Getting the positive image.
There are two possibilities:
a- With a computer. After scanning the negative image, you can turn the negative into positive through appropiate software as GIMP. Then you should print the image.
b- With the enlarger. In the darkroom the enlarger allows us to obtain the positve (on photo paper) which should be developed following the same process described in the point 3.

PINHOLE PHOTOGRAPHY
STUDENT	

BUILDING A CAMERA
(Describe the process you followed to build your camera)

TAKING A SNAPSHOT
(where, light conditions, time of exposure, topic,etc.

DEVELOPMENT
(describe the process to get the negative and the positive: materials, place, etc)

vocabulary

aperture	diafragma, abertura
barrel	tubo del objetivo
cable release	cable disparador
camera	cámara fotográfica
cover	tapa
darkroom	cuarto oscuro
to develop	revelar
development	revelado
digital camera	cámara digital
to enlarge	ampliar
enlarger	ampliadora
enlargement	ampliación
expose counter	contador de fotos
exposure meter	fotómetro
eyepiece	ocular
film	película
filter	filtro
filter holder	portafiltro
flash lamp	flash
flash socket	toma para flash
focus	enfoque
to focus	enfocar
frame	marco
lens	objetivo
negative	negativo
photo	fotografía
photograph	fotografía
photographer	fotógrafo
portrait	retrato
to print	imprimir
print	copia
rangefinder	telémetro
roll	carrete de fotos
screen	pantalla
shutter release	disparador
slide	diapositiva
snap (informal)	fotografía
snapshot	fotografía
telephoto	teleobjetivo
three-legged stand	trípode
tripod	trípode
viewfinder	visor
wide-angle	gran angular