

Q5. What do you think will happen to the image if the size of the pinhole is too big? Is your answer consistent with your observations in task 1?

Its don't was clear

Further questions to discuss: Based on the above model/representation of image formation, answer the following questions:

Q6. To get a clear image, why do you think object should be well-illuminated?

more intense light give a clear image.

Q7. What do you think will happen to the image, if the size of the pinhole is too small? Is your answer consistent with your observations in task 1?

image will be dark and don't a clear.

Task 3: Measuring the height of a very tall object

Pilot (Ideal scenario)

Figure 9 below shows the diagram for image formation in a pinhole camera.

You have to measure three quantities, distance (D) between pinhole and the object, screen–pinhole distance (l), and size (h) of the image on the screen.

Once you know D , l , and h you can find the height of the object H based on the following considerations.

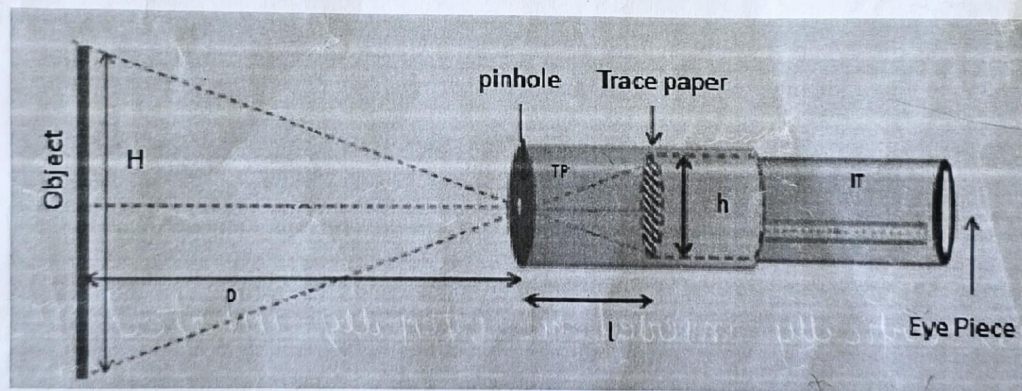


Figure 9: Schematic diagram of pinhole camera

Consider the two triangles in figure 9 with shared vertex at the pinhole. Since they are similar triangles, $h/l = H/D$. Rearranging we get $H = hD/l$

You may use the formula directly at this point without deriving it but you might want to check the properties of similar triangles to learn how the formula is derived.

Working (real) example

Now, we will make use of this equation in a real-life example. Take your pinhole camera, and capture an image of a distant (well-illuminated) object such as a building or a tree. Measure D using a tape, measure l using the scale on the inner tube, and h using the scale marked on the screen.

Obtain clear inverted image for multiple values of D . Tabulate your reading of D , l and h below:

6x0/1

D (cm)	l (cm)	h (cm)	H = hD/l (cm)
26.89 cm	2.5 cm	4.3 cm	4.47 cm
25.59 cm	3.8 cm	4.6 cm	5.23 cm
26.86 cm	2.7 cm	4.4 cm	4.72 cm

Table 1

Average height of the object, (Mean) $H = 4.814 \text{ cm}$

Q1. Can you estimate the height of the object by any other methods? Compare it with the answer you obtained using pinhole camera?

Measurement Scale,

Discuss

Q2. If you want to see a bigger image on the screen (without changing the pinhole screen distance l), should you move the pinhole closer to the object or farther away?

rate will be if move on the object closer

Q3. What will happen to the image if you make the screen using a transparent plastic sheet instead of translucent sheet?

Transparent sheet will not send image because it will allow maximum light pass through it

Credits

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